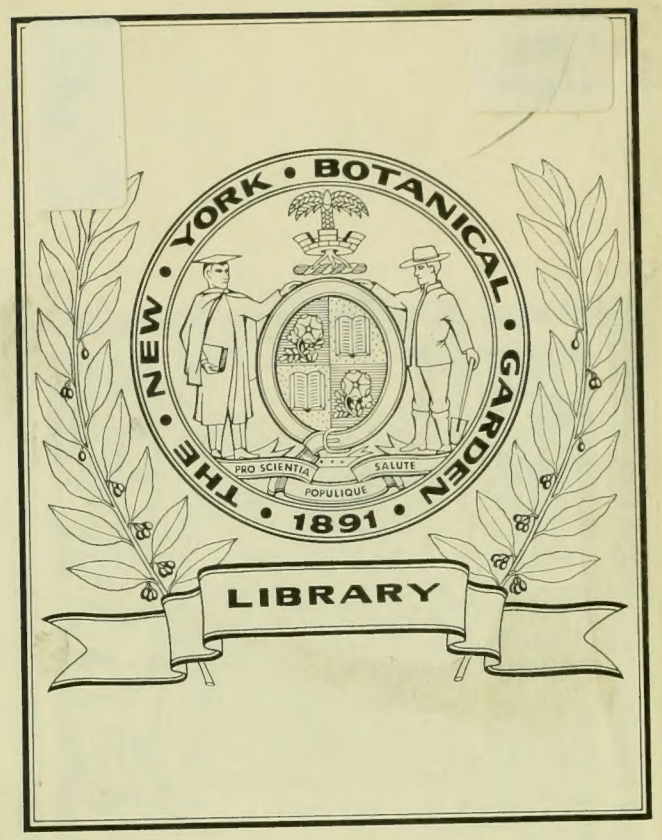
he Illustrated

CTIONARY of GARDENING

An Encyclopædia of Horticulture



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THE
CENTURY SUPPLEMENT
TO THE
DICTIONARY OF GARDENING.

LÆLIO-CATTLEYA FANNY LEON.

THE

CENTURY SUPPLEMENT TO THE DICTIONARY OF GARDENING,

A PRACTICAL AND SCIENTIFIC

Encyclopædia of Horticulture

FOR

GARDENERS AND BOTANISTS.

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VERY FULLY ILLUSTRATED.

GEO. T. KING, HYDE PARK, MASS., U.S.A.

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PUBLISHER'S PREFACE.

SINCE the first Part of NICHOLSON'S "DICTIONARY OF GARDENING" first saw the light, great changes have been brought about—changes which demand to be recognised in a work such as this aims to be. In nomenclature alone they have been exceedingly numerous, and plant names which had become almost household words have now been usurped by others unknown to any but botanists. Familiar examples of such changes may be cited in the Pampas Grass, formerly *Gynerium argenteum*, but now *Cortaderia argentea*, and in *Ampelopsis tricuspidata* (SYN. *A. Veitchii*), now known as *Vitis inconstans*.

In Horticultural practice a more extended experience with certain plants has resulted in the overthrow of some of the long-cherished notions entertained in regard to their treatment, necessitating some considerable modifications. And in no section perhaps is this more clearly shown than in Orchids on the one hand, or in Fruit Culture, both out of doors and under glass, on the other.

Certain groups of plants, like most other things, have had their day. Old favourites have gone and new ones have taken their place. Their prominence for the time may be due to Fashion alone; or it may be, and still oftener is, due to the fact that the florist has really improved upon existing forms by producing something of still greater beauty and of more robust constitution, or has introduced something new of great merit. Who, for instance, twenty years ago could have foretold the advent of the beautiful, if over-named, Hybrid Water-Lilies associated with M. MARLIAC? Or, again, who could have anticipated those beautiful additions to our outside gardens, the Hardy Bamboos, for whose introduction we owe so much to Mr. FREEMAN MITFORD?

Considerable progress has been made in what are termed Florists' Flowers—Dahlias, Roses, Violas, Carnations, Gladioli, Narcissi, &c.—and these plants of to-day are vastly different from those of the time of the first publication of the "DICTIONARY OF GARDENING"; and life-histories of Insects and Mites, as well as of Parasitic Fungi, have been so accurately worked out by entomologists and plant-pathologists that the methods of dealing with foes generally have been considerably improved upon.

The above are suggestive of some of the many and great changes which have taken place in the last two decades. How best to adequately deal with them, in

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a manner at once consistent with the reputation of the "DICTIONARY OF GARDENING" for thoroughness, and fair to subscribers, has been the earnest consideration of the Publisher. Eventually it was decided that the best way of meeting the difficulty was to issue a Supplemental Volume, to include all additions and modifications that Time has rendered necessary, thus bringing the entire work right up to the present time, without decreasing, but, on the contrary, increasing, the value of the volumes already in the hands of subscribers; for it must be remembered that the great bulk of the subscribers are working gardeners, to many of whom the purchase of the work has represented great personal sacrifice, and to whom its supersession by the issue of a new edition would have been a very grievous loss.

During the progress of the present volume through the Press there have been one or two important changes that unfortunately could not be noted in their proper places, owing to the fact that they were not made known until some time after the portion of the work to which they referred was printed. One of these is in connection with *Phaius tuberculosus* (Blume) [SYN. *Limodorum tuberculosum* (Thouars)]. Quite recently a terrestrial species was introduced for the first time that appears to be identical with the original plant of Thouars. The epiphytal species known in gardens under the above name, and figured as such in many works, is not, according to Mr. Rolfe, the original plant, and it has been named by him *P. simulans*, because of the remarkable resemblance the flowers bear to those of the original species.

As in the previous volumes, BENTHAM AND HOOKER'S great work, the "Genera Plantarum," has been made the basis of generic limitation, aided by such Monographs and Floras as have been recently published, together with the excellent series of Kew Handbooks, and of course the "Index Kewensis." To the synonymy due attention has been paid, though naturally with such a vexed question there is plenty of room for diversity of opinion.

To those eminent Specialists whose names appear on the title-page we offer our grateful thanks for valuable contributions and generous assistance at all times when asked; and we desire also to cordially acknowledge our indebtedness to Mr. W. BAKER-BARTLETT for his indefatigable exertions in matters of general research so little observed by the public eye, yet so important in a work like this.

Though the scholarly aid that the late Rev. PERCY MYLES gave in the matter of plant-name etymology has not been available for the present volume, we have been fortunate in receiving invaluable aid in this department from Mr. C. H. WRIGHT, of Kew. To several gentlemen and firms, notably Messrs. VEITCH AND SONS, Messrs. SANDER AND SONS, and Messrs. BARR AND SONS, as well as to the "Gardeners' Chronicle," we are indebted for the loan of illustrations, or photographs from which to prepare them; and our indebtedness is very great to Mr. R. I. MEASURES for many beautiful photographs, and especially for the charming drawing for the coloured illustration of *Epiphronitis Veitchii*.

LONDON.

REFERENCE TO ILLUSTRATIONS OF PLANTS OTHER THAN THOSE FIGURED IN THIS WORK.

MANY readers will be glad to be informed where reliable Illustrations can be found of those Plants which are not figured in this Work. To meet this want, references to the Figures in Standard Authorities have been given, the titles of the Works referred to being, for economy of space, abbreviated as follow:

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* Is still in course of publication.

1900 SUPPLEMENT

TO THE

DICTIONARY OF GARDENING.

GIVING PARTICULARS OF RECENT INTRODUCTIONS AND THE MOST MODERN METHODS OF CULTIVATION, DISCOVERIES IN THE MATTER OF PLANT DISEASES AND PESTS, &c., AND ALL ELSE CONNECTED WITH THE ADVANCE OF THE SCIENCE OF HORTICULTURE.

The following are the abbreviations used:—*fl.* flowers; *fr.* fruit; *l.* leaves; *h.* height; *deg.* degrees; *rhiz.* rhizomes; *cau.* caudex; *sti.* stipes; SYN. Synonym; ORD. Natural Order.

The Asterisks (*) indicate plants that are especially good or distinct.

ABAMA. A synonym of **Narthecium** (which *see*).

ABELIA. This genus embraces about half-a-dozen species, natives of the Western Himalayas, China, Japan, and Mexico. To those described on p. 1, Vol. I., the following should be added:

A. chinensis (Chinese).* The correct name of *A. rupestris* (of gardens). The garden variety *grandiflora* has large, pinkish-white flowers, and the whole plant is more vigorous than the type. It is a seedling of Italian origin. SYN. *A. uniflora.*

A. spathulata (spathulate). *fl.* sessile, in pairs on a short, slender peduncle; corolla white, with yellow blotches on the throat, nearly 1in. long. April. *l.* about 2in. long, elliptic-lanceolate, obtusely acuminate, sinuate-toothed, glabrous above, pubescent beneath, edged purple. Japan, 1883. A free-flowering, much-branched, evergreen shrub. See Fig. 1. (B. M. 6601.)

A. uniflora (one-flowered). (B. M. 4694; P. F. G. ii. 145.) A synonym of *A. chinensis.*

ABELICEA. A synonym of **Zelkova** (which *see*).

ABELMOSCHUS. Included under **Hibiscus** (which *see*).

ABENA. A synonym of **Stachytarpheta** (which *see*).

ABIES. SYN. *Picea* (of Don). For park decoration the genus *Abies* affords some of the most striking examples to be met with in the order *Coniferæ.* All are hardy, but on account of the liability of some species and varieties to push their growth very early in the year, they not infrequently get "cut." Landscape gardeners get over this difficulty by planting such precocious kinds in more exposed positions than would be assigned those which are not so early to make a start. *A. bracteata*, *A. cephalonica*, and *A. Webbiana* are familiar examples of trees with the tendency just alluded to. Taken as a whole the members of this genus are best planted where they are sheltered from cutting winds and in a good loam and leaf mould, with ample drainage. A moist position is best suited to some species, so long as the drainage is good, and especially so to *A. brachyphylla.*

To the species described on pp. 1-2, Vol. I., the following should be added:

A. Alcockiana (Alcock's), of gardens. A synonym of *Picea ajanensis.*

FIG. 1. ABELIA SPATHULATA.

Abies—*continued.*

FIG. 2. ABIES LOWIANA (Young Plant).

A. bifolia (two-leaved), of A. Murray. A synonym of *A. lasiocarpa.*

A. bifolia (two-leaved), of Siebold and Zuccarini. A synonym of *A. firma.*

A. brachyphylla (short-leaved), of Mayr. A synonym of *A. homolepis.*

A. campylocarpa (bent-fruited). A synonym of *A. magnifica.*

A. chiloensis (Chiloe). A synonym of *A. Webbiana.*

A. concolor violacea (violet). *l.* of a bluish-glaucous tint. A charming variety.

A. Eichleri (Eichler's). A synonym of *A. Veitchii.*

A. Gordoniana (Gordon's). A synonym of *A. grandis.*

A. grandis Lowiana (Low's). A synonym of *A. Lowiana.*

A. g. pendula (pendulous). A weeping form, which originated in a Berlin nursery.

A. holophylla (wholly-leafy). A synonym of *A. firma.*

A. homolepis (similar-scaled). *l.* axillary, 1in. long, somewhat two-rowed, very thickly placed, linear, flat, obtuse or bifid at apex, somewhat falcate; petioles very short. *cones* 3in. long, 1in. broad, cylindrical, obtuse, usually straight, on short stalks; scales brown, thickly imbricated. *h.* 100ft. Japanese Islands, 1861. SYN. *A. brachyphylla* (of Mayr).

A. Kæmpferi (Kæmpfer's). A synonym of *Pseudolarix Kæmpferi.*

A. lasiocarpa (woolly-fruited). *l.* notched on the barren and pointed on the fertile branches, in many rows, with two glaucous bands on the lower side. *cones* 2in. to 3½in. long, 1in. to 1½in. thick, with rounded scales. British Columbia, &c. Allied to *A. balsamea*, but larger, and having whitish bark. (G. C. 1889, v., p. 172, f. 23-32.) SYNS. *A. bifolia* (G. C. 1875, p. 465, f. 96-7), *A. subalpina* (G. C. 1880, p. 235, f. 43-45; J. L. S. xxii., p. 185).

A. Lowiana (Low's). *l.* long, linear, flat, straight, 1½in. to 2½in. long, one line broad, channelled above, twisted at base, distant, disposed in two horizontal rows along the shoots, blunt or slightly

Abies—*continued.*

notched at apex, dull glaucous-green above, paler beneath. *cones* 3½in. to 5in. long, 1½in. broad, erect, cylindrical, obtuse, rounded at base, pale brown. *h.* 250ft. Northern California, &c. Branches rather pendulous. A very handsome tree. See Fig. 2. (G. C. Dec. 11, 1886, p. 755, f. 143; 1890, Dec. 27, p. 750.) SYNS. *A. grandis Lowiana* (J. L. S. xxii., p. 175), *Picea Lowiana.*

A. magnifica xanthocarpa (yellow-fruited). *l.* on the leader shoot spirally appressed; those on the lateral shoots upturned, ascending; those on the sterile branches slender, straight or curved, more or less four-sided in section, grooved at base on the upper surface; those on the fertile branches stouter, shorter, all upturned, four-sided, not grooved. *cones* ovate-oblong, obtuse. SYNS. *A. nobilis robusta* (G. C. 1885, **xxiv.**, p. 657, f. 147), *A. shastensis.*

A. nephrolepis (reniform-scaled). A synonym of *A. Veitchii.*

A. nobilis robusta (robust). A synonym of *A. magnifica xanthocarpa.*

A. Nordmanniana. An illustration of this admirable tree for the lawn or park is given in Fig. 3.

A. N. horizontalis (horizontal). A dwarf, compact-growing form, with horizontally spreading branches; it cannot be made to produce a leader, hence its peculiar habit. A chance seedling found in a nursery in the Vosges.

A. N. pendula (drooping). A garden variety, distinguished from the type in having drooping branches. 1869. (R. H. 1890, p. 440, f. 182.)

A. numidica (Numidian). The correct name of *A. baborensis* (G. C. Feb. 4, 1888, p. 140, f. 23).

A. polita. The correct name is *Picea polita.*

A. shastensis (Shasta). A synonym of *A. magnifica xanthocarpa.*

A. subalpina is synonymous with *A. lasiocarpa.*

FIG. 3. ABIES NORDMANNIANA.

Abies—*continued.*

A. Webbiana obovata (obovate). This differs from the type mainly by the snowy whiteness of the under-surface of its leaves, which are deep green above

Pests. In common with many other Conifers, Abies are liable to attack from a host of Fungi, Beetles, Sawflies, and other insects, and suffer considerably therefrom. The most destructive will be found dealt with under the heading FUNGI in the genus **Pinus, Pine Bark Beetle, Pine Sawflies,** and **Pine Weevils** in the old volumes, and under **Agaricus, Polyporus, Oospora, Silver-Leaf Disease,** and **Æcidium** in the present one.

ABIES (of Don). A synonym of **Picea** (which *see*).

ABOBRA. *A. tenuifolia* is the name adopted by Cogniaux for *A. viridiflora* (described in Vol. I.); it is the only species of the genus.

ABOLARIA. A synonym of **Globularia** (which *see*).

ABROMA. About two or three species, natives of tropical Asia, Australia, &c., are included in this genus. Flowers dingy purple; calyx five-parted; petals five, with dilated claws, and ovate, spreading laminæ; peduncles opposite the leaves or almost terminal, few-flowered. Leaves palmately lobed or entire. To the species described on p. 3, Vol. I., the following should be added:

A. sinuosa (sinuate). *l.* broadly ovate, pedately pinnatifid, on slender petioles. Madagascar, 1884. A pleasing species, of slender habit.

ABRONIA. SYN. *Tricratus.* This genus includes about ten species. To those described on p. 3, Vol. I., the following should be added:

A. Crux-maltæ (Maltese Cross). *fl.* of a deep purplish-pink, the swollen throat of a bright emerald-green, the limb in general outline bearing a striking resemblance to a Maltese cross; heads axillary, ten to fifteen-flowered. *l.* ovate-oblong, somewhat obtuse, acute at base, on long petioles. Stem "a creeping vine," viscid-pubescent. California.

A. latifolia (broad-leaved). *fl.* yellow, about ½in. across, borne on very long peduncles; involucre two- or three-lobed. August. *l.* very variable in shape, but always much broader than long, borne on long petioles. Stem 6in. to 12in. long, procumbent, almost woody, terete. California. Whole plant glutinous. (B. M. 6546.)

A. mellifera (honey-bearing). *fl.* orange, in loose clusters; limb five-lobed; peduncles 4in. to 6in. long. July. *l.* ovate or ovate-oblong, oblique, fleshy, slightly sinuated, borne on long petioles. Stem decumbent. California and Mexico, 1826. (B. M. 2879.)

ABRUS. Wild Liquorice. Bentham and Hooker include five species under this genus, dispersed over the warmer regions of the globe; they are shrubs or sub-shrubs, often with long-twining branches. Flowers small, pinkish or whitish, racemes terminal, or the short flowering branchlets axillary; standard ovate; wings narrow.

ABSINTHIUM. Included under **Artemisia** (which *see*).

ABUMON. A synonym of **Agapanthus** (which *see*).

ABUTA. About half-a-dozen species, natives of tropical America, are referred to this genus. Sepals six, in two or three series, the outer ones small and bract-like; petals wanting; stamens six. Leaves coriaceous, three- to five-nerved, the nerves elevated beneath.

ABUTILON. This genus embraces about seventy species of herbs or shrubs, rarely trees, often softly tomentose, inhabiting the warmer regions of the globe. Flowers usually axillary, variously coloured, but often yellow; bracteoles wanting. Leaves often cordate, angled or lobed, rarely narrow. To the species and varieties described on pp. 4-5, Vol. I., the following should be added:

A. aurantiacum (orange). *fl.* axillary and solitary; calyx villous-pubescent; corolla bright orange, ¼in. to ⅜in. long. *l.* densely soft-tomentose, velvety, whitish, round-cordate, acute, ¼in. to 1¼in. broad, the basal lobes overlapping. Stems 6in. to 2ft. high. California.

Abutilon—*continued.*

A. esculentum (edible). *fl.* purple, axillary, solitary. September. *l.* cordate, acuminate, toothed, puberulous above, tomentose beneath. Stem tomentose with grey hairs. *h.* 7ft. to 8ft. Rio Janeiro, 1830. The natives cook and eat the flowers under the name of Bencao de Deos.

A. graveolens (strongly-scented). *fl.* orange and red, rather large, on pedicels about as long as the petioles. *l.* broadly orbicular-cordate. *h.* 1ft. to 5ft. Australia, 1842. A coarse annual or perhaps perennial, clothed with a viscid, strongly-scented tomentum.

FIG. 4. ABUTILON INSIGNE.

A. insigne (remarkable). The flowers of this are of a lovely rose, with darker veinings. See Fig. 4.

A. integerrimum (entire). *fl.* yellow, large, showy; petals broadly obovate-cuneate, oblique, distant, spreading, with an orange spot at base. May. *l.* large, orbicular-cordate, shortly acuminate, entire, on long petioles. Colombia. A small tree. SYN. *Sida integerrima.* (B. M. 4360.)

A. Thompsoni flore-pleno (double-flowered). A garden variety with double flowers. 1885. Greenhouse. (R. H. 1885, p. 324.)

A. vitifolium album (white). A variety with pure white flowers. 1889.

VARIETIES.—The following selection includes most of the best of the newer varieties having their origin in gardens. The majority are hybrids:—

CALYPSO, pure white, large. CAPRIVI, deep red, large. CHAMELEON, crimson. CHRYSOSTEPHANUM COMPACTUM, chrome-yellow; excellent for bedding. CLOTH OF GOLD, clear yellow; flowers large and bell-shaped, with overlapping petals. FLORIBUNDUM, orange-red, with darker veins. LE GRAND, deep red, with darker veins. MADAME JOHN LAING, rose, very large. Mr. H. CANNELL, a free-flowering hybrid from *A. megapotamicum.* MISS L. POWELL, yellow, dwarf. MR. WILLIAM BULL, fawn, veined crimson. PREMIER, rosy-purple, large. PRINCE OF ORANGE, orange. ROYAL SCARLET, red scarlet. SOUVENIR DE BONN, leaves rich green, margined with white. SURPRISE, golden yellow, veined red. WISSMANN, orange-buff, veined crimson.

ACACALLIS (derivation of name uncertain). ORD. *Orchideæ.* A monotypic genus. The species is a stove, epiphytal Orchid, with a short, leafy stem, at length thickening into a pseudo-bulb; it is distinguished from *Aganisia* by the curious appendage to the lip and by the

Acacallis—*continued.*

large auricles of the column. According to Messrs. Veitch, it requires to be grown in the highest temperature available in our Orchid-houses. On account of its climbing habit, it should be affixed to a block or raft; in other respects it will thrive under the ordinary East Indian house treatment.

A. cyanea (blue). The correct name of *Aganisia cærulea* (W. O. A. viii. 374).

ACACIA. Including *Farnesia.* In the "Genera Plantarum" about 420 species are allotted to this genus; they are dispersed over the warmer parts of the world, but are especially plentiful in Australia and in Africa. Sepals five, four, or three, free or united; petals as many, free or united; stamens indefinite, usually very numerous, free or slightly connected at the very base. Pods linear or oblong, flat or nearly cylindrical, straight, falcate, or variously twisted, opening in two valves or indehiscent. Leaves bipinnate; leaflets often small and many-jugate, or reduced to a filiform petiole (phyllode). To the species described on pp. 5-7, Vol. I., the following should be added. The hardy deciduous tree called *Acacia* in gardens is **Robinia Pseudacacia.** *See also* **Albizzia.**

A. Baileyana (Bailey's). *fl.* in small, globose heads, arranged in erect, loose racemes. Winter. *fr.*, pods long, linear-oblong. *l.* stalked, bipinnate; pinnæ consisting of small, linear leaflets. New South Wales and Queensland. (G. C. 1894, xv., p. 37, f. 4.)

A. coccinea (scarlet). A garden synonym of *Ormosia coccinea.*

A. cordata (heart-shaped). A garden synonym of *A. hastulata.*

A. cornigera (horn-bearing). A synonym of *A. spadicigera.*

A. floribunda (abundant-flowered), of Willdenow. A synonym of *A. angustifolia.*

A. floribunda, of gardens. A synonym of *A. retinodes.*

A. hastulata (somewhat hastate).* *fl.*, peduncles short and slender, each bearing a head of three to five flowers, mostly four-parted. May. *l.*, phyllodia numerous, hastate-lanceolate or almost cordate, tapering into pungent points, two or three lines long, with one central nerve. Branches rather slender, virgate or divaricate, terete. *h.* 2ft. to 3ft. Western Australia, 1824. (B. M. 3341.) SYN. *A. cordata* (of gardens).

A. Lebbek (Lebbek). The correct name is now *Albizzia Lebbek.*

A. leprosa (leprous).* *fl.* numerous in a globular head, mostly five-parted; petals yellow, united to the middle. May. *l.*, phyllodia narrow, linear-lanceolate, acute, or obtuse with a small point, narrowed at base, 1½in. to 3in. long. Branchlets pendulous, more or less glutinous. Australia, 1817. A tall shrub or small tree. (B. R. 1441.)

A. lineata (lined). *fl.* ten to fifteen or more in a small, globular head, mostly five-parted; petals yellow, smooth. April. *l.*, phyllodia linear, with a small, hooked point, usually ½in. to ¾in. long. Branches pubescent or villous, sometimes slightly resinous. *h.* 6ft. Australia, 1824. (B. M. 3346.)

A. Nemu (Nemu). A synonym of *Albizzia Julibrissin.*

A. obliqua (oblique). A synonym of *A. rotundifolia.*

A. petiolaris (petiolate). A synonym of *A. pycnantha.*

A. pycnantha (dense-flowered). *fl.* mostly five-parted; racemes short, with a few dense, globular heads of fifty to one hundred flowers. *l.*, phyllodia lanceolate-falcate, obtuse or rather acute, much narrowed to the base, 3in. to 6in. long. Victoria. A small or medium tree. SYN. *A. petiolaris.*

A. retinodes (retained). *fl.* mostly five-parted; racemes much shorter than the phyllodia, branched, with several (sometimes twenty) globular heads of twelve to twenty flowers. March. *l.*, phyllodia linear-lanceolate, falcate, much narrowed towards the base, mostly 3in. to 5in. long, finely penni-veined. Victoria. A moderate-sized tree. SYN. *A. floribunda* (of gardens).

A. spadicigera (spadix-bearing). *fl.* greyish and yellowish, forming cylindrical, spadix-like heads 1in. or more in length, disposed in axillary clusters. *l.* bipinnate; pinnæ four to eight pairs; leaflets fifteen to twenty pairs, linear-oblong, obtuse. Spines large, horn-like. Central America and Cuba, 1692. One of the so-called Bull's-horn Acacias; its hollow spines are tenanted by stinging ants. (B. M. 7395.) SYN. *A. cornigera.*

ACÆNA. New Zealand Bur. SYN. *Ancistrum.* This genus includes about thirty species of decumbent or somewhat creeping herbs, often shrubby at the base, the floriferous branches often erect and scape-like; they are distributed over the temperate and frigid parts of the Southern Hemisphere, being often found in Chili and Peru. To their value as rock-plants must be added their utility for growing under trees—and trees, too, like Conifers, beneath which scarcely anything will survive. The species *A. microphylla, A. myriophylla,* and *A. pulchella* may all be so utilised. To those described on p. 7, Vol. I., the following should be added:

A. adscendens (ascending). *fl.* dark purple; heads globose, borne on long peduncles. *l.*, leaflets ¼in. to 1in. long, obovate or elliptic-obovate, obtuse, toothed, glabrous above, silky beneath. Stems long-creeping, with ascending branches. Patagonia, 1888.

A. cuneata (wedge-shaped). A synonym of *A. sericea.*

A. ovina (egg-like). *fl.* purple, in long, interrupted spikes, denser towards the end. *l.* rather long; leaflets elliptic obtuse, pinnately cut to the middle, more or less pubescent on both sides or glabrous above. Australia, 1888. This is similar to *A. ovalifolia,* but it is a little larger and less graceful.

A. pinnatifida (pinnately-cleft). *fl.* crowded into cylindrical spikes, the lower ones rather remote. May and June. *l.* consisting of three to five pairs of deeply three- to five-parted leaflets; segments linear. Stem erect. *h.* 6in. Chili and Magellan Straits, 1822. Half-hardy perennial. (B. R. 1271.)

A. repens (creeping). A synonym of *A. sarmentosa.*

A. Sanguisorbæ (Sanguisorba-like). *fl.* in globose heads, ¼in. to ½in. in diameter; scapes slender, two-leaved. *l.* 2in. to 6in. long; leaflets eight to ten pairs, very variable in shape, membranous, coarsely serrated, ¼in. to ⅝in. long. New Zealand. A much-branched, prostrate herb, more or less silky, especially on the nerves beneath.

A. sarmentosa (having runners). *fl.* in globose heads, on tomentose peduncles of moderate length, with one or two bracts. Tristan d'Acunha, 1888. A rampant species, similar to *A. Sanguisorbæ,* but stouter, with longer branches, leaves more silky beneath and longer hairs. "Perhaps the plant in cultivation is not correctly named, as it is said to come from South America" (N. E. Brown).

A. sericea (silky).* *fl.* green, in globose heads, on long peduncles, which also bear two or three smaller heads, sessile in the axils of leafy bracts. *l.* rather long; leaflets only three to five pairs, cuneate-oblong, toothed, silky beneath. Patagonia and Chili, 1888. SYN. *A. cuneata.*

A. splendens (splendid). *fl.* in long, interrupted spikes, borne on long, stout peduncles. *l.*, leaflets three or four pairs, obovate or ob lanceolate, toothed, densely white-silky on both sides. Chili, 1888

ACALYPHA. SYN. *Cupameni.* This genus comprises about 220 species, broadly dispersed over the warm

FIG 5. PORTION OF INFLORESCENCE OF ACALYPHA HISPIDA.

Acalypha—*continued.*

regions, a few being extra-tropical American. Leaves alternate, often ovate, more or less toothed, three- to five-nerved or penniveined. To the species, &c., described on p. 7, Vol. I., the following should be added:

A. Chantrieri (Chantrier Frères'). A garden hybrid between *A. Hamiltoniana* and *A. macrophylla*. 1897.

A. Godseffiana (Godseff's). *l.* ovate-lanceolate, shining green, with creamy-white margins. New Guinea. An ornamental, dwarf, bushy shrub.

A. Hamiltoniana (Hamilton's). *l.* bright green, with prominently rounded, yellow teeth. 1895.

A. hispida (hispid).* *fl.* bright red, "resembling crimson plush," in drooping, tassel-like spikes, 12in. to 20in. long, sometimes 1in. in diameter, borne on axillary peduncles. *l.* spreading, 5in. to 5½in. long, 3in. to 3½in. broad, ovate, acute or shortly acuminate, rounded at base and emarginate at the insertion of the pubescent petiole, which is 2in. to 2½in. long; upper surface bright green and sparsely hairy; lower surface paler. *h.* 10ft. to 15ft. New Guinea, 1896. A beautiful species. See Fig. 5. SYN. *A. Sanderi.*

A. mortfontanensis (Mortefontaine). A garden hybrid between *A. Hamiltoniana* and *A. marginata*. 1897.

A. obovata (obovate). *l.* obovate, green with creamy edges when young, changing with age to olive-green with pink margins, and finally having a bronzy centre and broad rosy-crimson margins. Polynesia, 1884. An ornamental foliage plant.

A. Sanderi (Sander's). A synonym of *A. hispida.*

A. triumphans (triumphant). *l.* large, cordate, toothed, acute, variegated with deep crimson, green, and brown. Solomon Isles, 1888. A good foliage plant; probably a variety of *A. Wilkesiana.* (L. H. xxv., t. 55.)

A. eremorum, *A. illustrata*, and *A. Makoyana* are also occasionally seen in gardens

ACAMPE (from *akampes*, inflexible; in allusion to the very brittle texture of the flowers). ORD. *Orchideæ.* A genus embracing about nine species of stove, epiphytal Orchids, eight of which are natives of the East Indies and Southern China, while the other is found in South-east Africa; they are closely allied to *Saccolabium* (Hooker, in the "Flora of British India," includes them under that genus). Flowers much smaller than in *Vanda*, shortly pedicellate; sepals free, sub-equal, somewhat fleshy; petals similar but rather narrower; lip sessile at the base of the column, continuous, spreading, saccate or conico-spurred at base; column short and thick; peduncles lateral, rigid, short and simple, or elongated and panicled. Leaves distichous, coriaceous. Stem leafy, not pseudo-bulbous. For culture of the following species, *see* **Saccolabium.**

A. dentata (toothed). *fl.* whitish-yellow, blotched with brown, ¼in. to ½in. in diameter; panicle longer or shorter than the leaves, the branches distant and lax-flowered. *l.* 7in. to 9in. long, 1in. to 1½in. broad. Stem 1ft. to 2ft. long. India, 1872.

A. longifolia (long-leaved). *fl.* sweet-scented, inconspicuous, much like those of *A. multiflora*, corymbose; lip white. *l.* dark green, distichous, leathery, 1½ft. long, 2in. broad, obliquely rounded at apex. India.

A. madagascariensis (Madagascar). *fl.* small; sepals and petals whitish; lip rosy-purple. *l.* thick and leathery. Madagascar, 1891. Allied to *A. papillosa.*

A. multiflora (many-flowered). *fl.* yellow, with blood-coloured dots, small; lip ovate, somewhat acute; peduncle branched, erect, sub-corymbose, shorter than the leaves. *l.* lorate, obliquely emarginate at apex. China. SYN. *Vanda multiflora* (L. C. B, 38).

A. papillosa (papillose). *See* **Saccolabium papillosum.**

A. Wightiana (Wight's). *fl.* yellow, barred with crimson, not papillose, ¾in. to 1in. across; scape very stout; bracts very broadly ovate, acute. *l.* 4in. to 6in. long, ¾in. to 1in. broad. Stem 1ft. to 1½ft. long. India.

ACANTHEPHIPPIUM. *See* **Acanthophippium.**

ACANTHODIUM. Included under **Blepharis** (which *see*).

ACANTHOGLOSSUM. A synonym of **Cœlogyne** (which *see*).

ACANTHOLIMON. Prickly Thrift. SYN. *Armeriastrum.* ORD. *Plumbagineæ.* Eighty-four species have been described, but, according to Bentham and Hooker, some of them are mere varieties; they are natives of the Orient, extending from Greece and Syria to Western Thibet, and being most plentiful in Persia. These plants may also be increased by layering the shoots in late

Acantholimon—*continued.*

summer. To those described on p. 8, Vol. I., the following should be added:

A. androsaceum (Androsace-like). *fl.*, corolla of an intense purple, with an ample limb; spike very short, fasciculate-distichous, or sub-second, with three to seven spikelets; scape scarcely any or almost equalling the leaves. July. *l.* short. Branches short and densely spiny. *h.* 6in. Southern Europe, 1813. SYN. *Statice echinus* (S. F. G. 300).

A. melananthum (dark-flowered). *fl.* in a very short spike of six to nine spikelets; calyx limb bordered with dark violet or black. *l.*, lower ones very short, flat, triangular-lanceolate, mucronate; the rest spiny, short. Branches short. Persia.

ACANTHOMINTHA (from *akanthos*, a spine, in allusion to the spiny-toothed bracts, and *Mentha*, Mint, as the plant was formerly included under *Calamintha*). ORD. *Labiatæ.* A monotypic genus. The species is a small, glabrous, half-hardy annual, requiring ordinary cultivation.

A. ilicifolia (Holly-leaved). *fl.* three to eight in a whorl in all the upper axils; whorls subtended by opposite bracts, which are larger than the leaves and spiny-toothed; calyx tubular, bilabiate; corolla ¼in. long, the upper lip white, small, the lower one purple, with a yellow throat, four-lobed. July. *l.* petiolate, ½in. to 1in. long, rounded or ovate, with a cuneate base, coarsely and bluntly toothed. Branches ascending, 6in. to 8in. long. California, 1883. (B. M. 6750.)

ACANTHONEMA (from *akanthos*, a spine, and *nema*, a filament; in allusion to the filaments of the two inferior stamens being produced into a spine-like process just below the anther). ORD. *Gesneraceæ.* A monotypic genus. The species is a stove perennial, much resembling *Streptocarpus* in habit. It thrives in a compost of sandy loam and peat, the former predominating, and may be increased by seeds.

A. strigosum (strigose). *fl.* whitish, ¼in. to ¾in. long, with a blood-purple, five-lobed limb; panicles 1in. to 2in. high, sessile on the midrib at the base of the leaf. June to August. *l.* radical, solitary, 4in. to 9in. long, spreading on the ground, linear-oblong, cordate at base, shortly petiolate, recurved at apex, strigose with scattered hairs. Tropical Africa, 1862. (B. M. 5339.)

ACANTHOPANAX (from *akanthos*, a spine, and *Panax*; alluding to the spiny stems and Panax-like aspect of the plants). ORD. *Araliaceæ.* A genus embracing about eight species of stove or greenhouse, glabrous or tomentose shrubs (rarely trees ?), natives of Japan, China, and tropical Asia. Flowers polygamous or hermaphrodite; petals five, rarely four, valvate; stamens five, rarely four, the filaments filiform; pedicels continuous with the flowers; bracts small or wanting; umbellets paniculate or almost solitary. Leaves palmately cleft, digitate, or one-foliolate. Only two species call for mention here:

A. ricinifolium (Ricinus-leaved). The correct name of the plant described on p. 104, Vol. I., as *Aralia Maximowiczii.*

A. spinosum (spiny). The correct name of *Aralia pentaphylla.*

ACANTHOPHIPPIUM. About half-a-dozen species, natives of India, the Malayan Archipelago, &c., are included in this genus. To those described on p. 8, Vol. I., the following should be added:

A. Curtisii albidum (whitish). *fl.* creamy-white, with rose and purple dots on the inner surface, thick and fleshy; lateral sepals joining to form a large, pouch-like organ. 1898. (L., t. 619.)

A. eburneum (ivory-white). *fl.* white, nearly 2in. long; scape two-flowered. *l.* oblong-lanceolate, plicate, 8in. long, 2in. broad. Pseudo-bulbs purplish, angular, 2in. to 3in. long. Malaya (?), 1896. Allied to *A. Curtisii.*

A. Mantinianum (Mantin's). *fl.*, sepals yellow, slightly shaded with green, spotted and blotched with purple; petals resembling the sepals, but having the lower portion whiter; lip of a waxy white, the thickened part of the disk orange-yellow with ridges spotted and lined with purple. Philippines, 1896. A near ally of *A. bicolor*, from which it mainly differs in the colour of its flowers and its much more robust habit. (L. 1896, t. 536.)

A. striatum (striated). *fl.* white, streaked with red; lip with a single, median, crested ridge and thickened lateral curves, the side lobes very broad, falcate, obtuse, the mid-lobe scarlet, contracted, acute. Spring. Nepaul. Allied to *A. sylhetense*, but the flowers are much shorter.

ACANTHOPHŒNIX. Prickly Date Palm. Three or four species, all natives of the Mascarene Islands, are included in this genus. Flowers red or yellow, monœcious on the same spadix, borne under the leaves; spadix doubly branched, pendulous; spathes two, deciduous; bracts rather prominent, thick and rigid. Fruit black,

Acanthophœnix—*continued.*

sometimes scarcely longer than grains of wheat. Leaves terminal, equally pinnatisect, armed with more or less elongated spines. To the species described on p. 8, Vol. I., the following should be added:

A. grandis (large). This is described as "a handsome Palm, with finely-cut leaves and deep brown spines, native of Brazil" (in I. H. 1895, p. 185). According to the "Kew Bulletin," 1896, App. II., it is "also called *Calamus grandis*, and stated to be a native of Borneo" (I. H. 1895, p. 223). The genus is, however, according to Bentham and Hooker, as well as J. G. Baker, confined to the Mascarene Islands, as above stated.

A. Herbstii (Herbst's). A synonym of *A. crinita.*

A. rubra (red). *fl.* reddish-brown; spadix 2½ft. to 3½ft. long; peduncle 6in. to 10in. long, armed with straight spines; spathes 1½ft. to 2½ft. long. *l.* 6ft. to 12ft. long; leaflets slightly glaucous beneath; petioles glabrous, 2in. to 4in. long; sheaths 2½ft. to 4½ft. long, thickly covered with brownish-black spines. *h.* 60ft. SYN. *Calamus Verschaffeltii* (of gardens).

ACANTHOSTACHYS [not *Acanthostachyum*]. According to J. G. Baker, this genus embraces a couple of species, natives of Brazil. Sepals lanceolate-deltoid, acute, free to the top of the ovary; petals lingulate, scaled at base, rather longer than the calyx; stamens shorter than the petals. *A. strobilacea* is the only species known in gardens.

ACANTHOSTIGMA PARASITICUM. *See* **Silver Leaf Disease.**

ACANTHUS. Including *Dilivaria.* About fourteen species, inhabiting tropical and sub-tropical regions, are included in this genus. To those described on pp. 8-9, Vol. I., the following should be added:

A. Caroli-Alexandri (Charles Alexander's). *fl.* white, often suffused rose-colour, in a dense spike. Summer. *l.* few, radical, in a lax rosette, lanceolate, pinnatifid, spiny-toothed, 16in. long, 3in. to 4in. broad. Stem 9in. to 18in. high, with two to four similar leaves. Greece, 1837. (R. G. 1886, pp. 626-635, f. 73-75.)

ACARIDA. *See* **Ticks.**

ACCLIMATISATION. Popularly this is the inuring of plants, &c., to a climate different from that of which they are native, which is, however, fallacious. No tender plant has yet by any process, gradual or otherwise, been rendered hardy. Those who put forth the theory adduce as a case in point the common Larch. That this tree and many others were originally grown in this country as greenhouse subjects there cannot be any doubt; but this was due to a lack of knowledge.

With plants that reproduce themselves by seed, it is possible, by annually selecting the hardiest and most vigorous individuals, and using these again as seed-parents, to produce a hardier race. And conversely it is possible, by choosing as seed-parents individuals which stand the heat best, to develop, after a few generations, tropical races of cool-country vegetables and flowers: such selection is constantly going on in India, &c., amongst vegetables raised, in the first place, from English seeds.

ACCRESCENT. Increasing in size after flowering.

ACER. The species of this genus number upwards of fifty, and are found in Europe, North America, North Asia, Java, and the Himalayas. Flowers racemose or corymbose, axillary and terminal, generally polygamo-dicœcious. Leaves opposite, usually palmately or sub-pedately three- to seven-lobed or parted, rarely entire. To the species and varieties described on pp. 9-11, Vol. I., the following should be added. **Negundo** (which *see*) is now included hereunder.

A. argutum (sharp). *l.* palmately lobed, borne on long petioles. Japan. A very elegant species, of medium height; it is as yet very uncommon in English establishments.

A. campestre postelense (Postel). A yellow-leaved form. 1896.

A. caucasicum (Caucasian). A synonym of *A. hyrcanum.*

A. cissifolium (Cissus-leaved). The correct name of *Negundo cissifolium.*

A. coccineum (scarlet). A synonym of *A. rubrum.*

A. colchicum (Colchican). A synonym of *A. pictum rubrum.*

A. c. tricolor (three-coloured). A synonym of *A. pictum tricolor.*

A. cratægifolium (Hawthorn-leaved). *l.* small, deep green, closely resembling those of Hawthorn. Japan. A slender tree.

Acer—*continued.*

The form *Veitchi* is very attractive, having variegated leaves it is very uncommon and quite hardy.

A. dasycarpum pulverulentum (powdered). In this form the leaves are spotted with white and the tips of the young shoots tinted red. 1889.

A. diabolicum (diabolical). *fl.* greenish-yellow, large, disposed in numerous short racemes. Spring. *l.* large, Plane-like. Branches stout. Japan. A free-growing tree. SYN. *A. pulchrum.*

A. Duretti aureo-marginatum (Durett's gold-margined). *l.* margined and dotted yellow. 1896.

A. Ginnala. There are several forms of this variety of *A. tataricum*, including *angustilobum* (leaves narrow-lobed) and *pulverulentum* (powdery).

A. Heldreichii (Heldreich's). *fl.* in small, terminal panicles, which are shorter than the leaves. *l.* small, palmately five-lobed; lobes obtusely dentate, acute, the middle one cuneately tapering to its base. Greece. (G. C. 1861, xv., p. 141; R. G. 1185.)

A. hyrcanum (Hyrcanian). *fl.* in sub-sessile, nodding corymbs. *l.* sub-orbicular, cordately five-cleft, rich green, shaded with yellow, later brownish-tomentose on the under-side, very pleasing in autumn when turning to a reddish-brown; lobes obovate, incised or toothed. Caucasus. A compact species, of rather slow growth. SYN. *A. caucasicum.*

A. insigne (remarkable).* *fl.* green, ¼in. in diameter; panicles pyramidal, terminal, 3in. to 4in. long, appearing with the leaves. May. *l.* 5in. to 6in. in diameter, rounded-reniform, palmately divided to the middle into five to seven oblong, acute, coarsely and obtusely serrated lobes, glabrous above, more or less tomentose beneath. Persia. The latest of all the Maples to come into leaf. (B. M. 6697.) SYN. *A. velutinum.*

A. integrum (entire). A synonym of *A. palmatum linearilobum.*

A. Juhlkei variegata (Juhlke's variegated). *l.* when young having about half their area creamy-coloured, but the variegation very irregular. 1898.

A. lætum (pleasing). This species is closely related to *A. Lobelii*, but is principally distinguished in having leaves more cordate at the base, more delicate, more glaucous, and with the lobes more pointed. Orient.

A. marmoratum (marbled). A variety of *A. pictum.*

A. Miyabei (Miyabe's). A fine, ornamental species, nearly related to the Norway Maple, *A. platanoides.* Japan, 1894. (G. and F., 1893, 143.)

A. neapolitanum (Neapolitan). A variety of *A. opulifolium.*

A. Negundo. The correct name of *Negundo fraxinifolium.*

A. N. elegans (elegant). *l.* pale green, irregularly bordered and splashed with yellow, changing to creamy-white with age. A fine, decorative, free-growing tree.

A. N. foliis-marginatis-aureis (leaves golden-margined). *l.* bordered with golden-yellow. 1889. This variety is as constant as the silver-variegated form, and of more vigorous growth.

A. N. Guichardi (Guichard's). *l.* all yellow, resembling those of the golden Elder. 1889. A fairly vigorous form.

Among other new varieties of this popular species may be mentioned the following: *boreale* (said to have been introduced from Canada, and to ripen seeds in the colder parts of Europe where the typical plant would be killed by frost); *densiflorum* (dense-flowered); *falcatum* (sickle-shaped); *Koehneanum* (Koehne's); *odessanum* (leaves of a deeper golden, and retaining that colour longer, than in the type); *pendulum* (a weeping form); *rectangulum* (right-angled).

A. nigrum (black). A form of *A. saccharinum.*

A. nikoense (Niko). The correct name of *Negundo nikoense.*

A. opulifolium neapolitanum (Neapolitan). This nearly resembles the variety *obtusatum*, but differs by its undulated leaves with more pointed lobes and by the larger fruits with longer, spreading wings.

A. ornatum (ornate). A form of *A. palmatum.*

A. palmatum Aokii (Aoki's). *l.* creamy-white and pink, finely divided. 1892. (R. G. 1363.)

A. p. aureum (golden). A handsome form, with rich yellow foliage.

A. p. dissectum roseo-pictum (rose-painted). A garden sub-variety. 1887.

A. p. linearilobum (linear-lobed).* *l.* deep olive-green, much divided, the lobes almost linear. 1896. A handsome Japanese Maple. See Fig. 6. SYN. *A. integrum.*

A. p. ornatum (ornate). *l.* digitate, borne on slender petioles, their divisions attenuated and deeply cut, with long, slender, toothed segments. Branches numerous, feathery. Japan, 1867. A beautiful, slender tree. (R. H. 1867, p. 391.)

A. p. septemlobum elegans (elegant). *l.* changing from pale green through pink and crimson to dull red, beautifully lobed. The form *laciniatum* has soft green leaves touched with rose-colour.

A. pictum marmoratum (marbled). *l.* palmate, acutely lobed, marbled with yellowish-green on a deeper green ground, freely produced on the new growth. Habit bushy. 1894.

A. p. tricolor (three-coloured). *l.*, young ones of a bright violaceous-red, irregularly shading off here and there into all tints of dark red or crimson to creamy-white. 1880. Garden variety. SYN. *A. colchicum tricolor.*

Acer—*continued.*

A. platanoides compactum (compact). An ornamental variety, producing a compact, round head. 1886.

A. p. globosa (globular). A neat, round-headed form, rather slow in growth.

A. p. integrilobum (entire lobed). This only differs from the type in having the lobes of the leaf entire. (R. G. 1837, p. 431, f. 107-8.)

A. p. multicolor (many-coloured). *l.* red, large, speckled and blotched with yellowish-white later. 1896.

A. p. Reitenbachii (Reitenbach's). *l.* large, changing in the autumn to a deep crimson-red, varying to yellow and brown.

A. p. rubrum (red). A variety with leaves distinctly reddish-brown.

A. p. undulatum (wavy). *l.* bullate, with very wavy, crisped margins. A curious and interesting variety.

Among other varieties of the Norway Maple the following may be mentioned: *columnare, dilaceratum, euchlorum, integrifolium, nanum* (SYN. *pygmæum* of gardens), and *quadricolor.*

A. polymorphum (many-formed). A synonym of *A. palmatum.*

FIG. 6. ACER PALMATUM LINEARILOBUM.

A. Pseudo-platanus atropurpureum (dark purple).* A very fine variety, with dark purple leaves; worthy of extensive cultivation.

A. P.-p. elegantissimum variegatum (very elegant, variegated). *l.* in spring suffused with rose-pink on a cream ground, and in some cases irregularly splashed with green. A vigorous and showy sport from *A. P.-p. Leopoldi.*

A. P.-p. flavo-marginatum (yellow-margined). *l.* pale green, mottled and edged with white.

A. P.-p. Leopoldi (Leopold's). *l.* marbled with purple, yellow, and green; petioles red. A very pretty, Belgian variety.

A. P.-p. Webbianum (Webb's). Similar in colour of leaves to *flavo-marginatum*, but of more vigorous growth.

A. pulchrum (pretty). A synonym of *A. diabolicum.*

A. pygmæum (dwarf). A garden name for a dwarf form of *A. platanoides integrilobum.*

A. rubrum Drummondi (Drummond's). *l.* streaked with red on the upper surface, glaucous beneath. 1892. (R. G. 1374.)

A. septemlobum (seven-lobed). A form of *A. palmatum.*

A. Trautvetteri (Trautvetter's). A synonym of *A. Van Volxemi.*

A. Van Volxemi erythrocarpum (red-fruited). A variety with red fruit. Caucasus, 1892.

A. velutinum (velvety). A synonym of *A. insigne.*

A. Wieri laciniatum (Wier's, cut). A weeping variety, having long, slender shoots clothed with delicately-cut foliage; it is admirably adapted for the outskirts of the lawn.

INSECTS AND DISEASES. Several of the commoner species of Maples used for the decoration of large gardens and parks are frequently almost defoliated early in the season. This is especially the case with the Norway Maple (*A. platanoides*), the Common Maple and its varieties, and less frequently, perhaps, with the Sycamore. Such defoliation usually takes place between August and September, and is very noticeable some years in our London parks.

Acer—*continued.*

It is due to a distinct and well-characterised fungus, *Rhytisma acerinum.* Popularly it is sometimes called Maple Blotch, on account of the roundish yellow patches found upon the foliage in late summer. These towards autumn take on a black colour, and the leaves are shed. In such cases spraying is out of the question, and preventive measures must alone be relied upon for lessening the attack another season. This is best done by collecting and burning the leaves, which otherwise would be the means of conveying the disease to the trees in the spring.

Another fungus frequently found upon Maples (*Acer*), as well as upon other trees used ornamentally in parks and large gardens, is *Nectria cinnabarina*, a near relative of that pest of Apple Orchards mainly responsible for the condition known as Canker. These are popularly known as Wound Fungi, on account of their only attacking a tree which has previously been injured either by atmospheric influences, or by careless use of tools at planting time, &c. *N. cinnabarina* is quite unable to attack a tree with absolutely sound bark; but once a wound has been made the fungus finds an entrance, and the wood is immediately involved, as the mycelium spreads rapidly, working in an upward direction. Naturally, the sap-flow is considerably interfered with, and that portion of the tree is unable to receive any nourishment, the wood assumes a blackened appearance, and the invaded branches die away. To an unpractised eye the causes may not at first be evident, though later they should be, when the very beautiful orange-red stromata are produced upon the bark in the vicinity of the wound. These are followed by the warted, button-like reddish growths, and the tree goes from bad to worse. As this is one of the fungi requiring not even a glass to see its beautiful stromata, it should be readily recognised, and preventive measures adopted. The importance of at once dealing with bark-wounds caused by frost, hail, as well as by implements, will be apparent. The best application is a smear of tar. When, however, branches die, and the presence of the fungus is noted in their vicinity, such dead portions should be cut away directly they are seen, and burned. Fallen branches and twigs should be also burned. This fungus is parasitic as well as saphrophytic.

One of the chief insect depredators to Maple foliage is a species of Sawfly, *Phyllotoma aceris*, whose larvæ are leaf-miners. Their presence may be indicated by an irregular blotch, especially if the leaf or leaves be carefully examined. The larvæ are usually feeding at midsummer, or a little earlier. Little can be done at that time, though later, when in the pupa-state, the cocoons may be collected from the tree-trunk and burned. These Sawflies seem most partial to *Acer Pseudo-platanus.*

Other insects in the form of the ubiquitous Vapourer Moth Caterpillar (*Orgyia antiqua*) also attack the trees, especially in towns; and where a good force of water can be applied, as from a stand-pipe or powerful engine, a good washing several times during a very dry summer would be useful in dislodging such pests.

ACERANTHUS (from *Acer*, the Maple, and *anthos*, a flower; the flowers resemble those of the Maple). ORD. *Berberideæ.* A monotypic genus. The species, *A. diphyllus*, is a hardy herbaceous perennial, with a creeping rhizome, also known as *Epimedium diphyllum* (under which name it is described in Vol. I.). Sepals seven or eight, resembling the petals, the outer ones rather smaller; petals flat; stamens four, free. Stem one-leaved, racemose at apex.

ACERATIUM. Bentham and Hooker include this genus under **Elæocarpus** (which *see*).

ACERINEÆ. The *Acerineæ* are now regarded as a sub-order of the Natural Order *Sapindaceæ.* It embraces the well-known genera *Acer* and *Negundo* (the latter now included under *Acer.* Flowers regular. Leaves always opposite, simple or pinnately three- to five-foliolate.

ACHANIA. A synonym of **Malvaviscus** (which *see*).

ACHERONTIA ATROPOS. *See* **Death's-Head Moth.**

ACHETA. This was the old generic name for the Crickets, of which there are four representatives in this country, and three of them injurious to field and garden produce. The more modern names for the Crickets are *Gryllus domesticus* (House Cricket), *Gryllus campestris* (Field Cricket), *Nemobius sylvestris* (Small Field Cricket), and *Gryllotalpa vulgaris* (Mole Cricket). *See* **Crickets** and **Mole Cricket.**

ACHILLEA. Yarrow. Upwards of 100 species have been described by botanists (but according to the authors of the "Genera Plantarum," the number may be considerably reduced): they inhabit Europe and Western Asia, *A. Ptarmica* (Sneezewort) and *A. Millefolium* being indigenous in Britain. Leaves alternate.

FIG. 7 ACHILLEA (THE PEARL).

The Achilleas are all sun-lovers, and though, as stated in Vol. I., many are coarse-growing, yet there are a few which are really choice, hardy perennials, decorative in the borders, and extremely useful for furnishing cut-flower material. The best for this are *A. mongolica* and the double-flowered forms of *A. Ptarmica*, like The Pearl (see Fig. 7) and Snowball. To the species described on pp. 11-12, Vol. I., the following should be added:

A. ageratifolia (Ageratum-leaved). The correct name of *Anthemis Aizoon*; it is also called *A. ageratoides* in gardens.

A. micrantha (small-flowered). *fl-heads* yellowish, in a compound, fastigiate corymb; ray florets five, obtusely three-toothed at apex. Summer. *l.* pinnatisect, with pinnatipartite segments; lobes linear, entire, acute. Stems erect. Cappadocia, &c. A decorative, hairy perennial.

A. rupestris (rock-loving).* *fl.-heads* white, greenish towards the centre, pedicellate, ½in. to ¾in. broad; corymbs 1in. to 1½in. in diameter. May. *l.* on the shoots rosulate, ½in. to ¾in. long, linear-spathulate, entire; cauline ones similar, scattered, spreading. Rootstock tufted. Southern Italy, 1886. (B. M. 6905.)

ACHIMENES. SYNS. *Cyrilla* (of L'Héritier), *Trevirana*. Including *Dolichoderia*, *Eucodonia*, *Kœrnickia*, *Locheria*, *Mandirola*. About a score species, all tropical American (from Brazil to Mexico), are included in this genus. To the species and varieties described on pp. 12-14. Vol. I., the following should be added:

A. amabilis (lovely). A synonym of *Nægelia multiflora*.

A. argyrostigma (silvery-spotted). A synonym of *Kœllikeria argyrostigma*.

A. candida. The correct name is *Dicyrta candida*.

A. cupreata. The correct name is *Episcia cupreata*.

A. gloxiniæflora. The correct name is *Gloxinia glabrata*.

A. Jaureguia (Jaureguia). A variety or synonym of *A. longiflora*.

A. lanata (woolly). *fl.*, corolla pinkish-lilac, swelling from the base, the lobes purple-veined and denticulate, the throat white, with orange dots; peduncles axillary, one-flowered, nearly four times the length of the petioles. October. *l.* broadly ovate, obtuse at both ends, crenulate, roughly veined on the upper surface. Stem (and foliage) more or less whitish-hairy. *h.* 6in. Mexico, 1856. SYN. *Scheeria lanata* (B. M. 4963).

A. ocellata. The correct name is *Isoloma ocellatum*.

Achimenes—*continued.*

A. picta (painted). The correct name is *Isoloma bogotense*.

A. Scheerii (Scheer's). *fl.* purplish or bluish; calyx hairy; corolla funnel-shaped, pubescent-hairy outside, puberulous within. August. *l.* opposite, petiolate, ovate, acuminate, serrated, greenish-purple beneath. Stems erect, hairy. *h.* 9in. Mexico, 1850. SYN. *Scheeria mexicana* (B. M. 4743).

A. tubiflora (tubular-flowered).* *fl.* pure white; corolla tube 4in. long, a little enlarged and curved upwards, with a broad gibbosity at base, the limb 1½in. broad, equally five-lobed; pedicels 2in. long; panicle several-flowered. Summer. *l.* opposite, oblong, acuminate, reticulated, downy, obscurely crenate; petioles short and thick. Buenos Ayres. See Fig. 8. SYNS. *Dolichoderia tubiflora*, *Gloxinia tubiflora* (B. M. 3971; B. R. 1845, 3).

VARIETIES. In addition to those given in Vol. I. the following may be named:

ARCTURUS, deep red; BRILLIANT, scarlet; CELESTIAL, white, violet-tinged, large flower; CHELSONI, dark blue, very free; COQUETTE, violet-purple, beautifully ringed at throat; EDMUND BOISSIER, white, tinged lilac; ESTELLE, violet, white centre; LADY LYTTELTON, violet-purple, with yellow throat; SIR TREHERNE THOMAS, rose-purple, very free; VIOLETTA, violet-purple, darkly veined at throat.

FIG 8. FLOWERING BRANCH OF ACHIMENES TUBIFLORA.

ACHIMENES (of Vahl). A synonym of **Artanema** (which *see*).

ACHRAS (from *Achras*, a kind of wild Pear). SYN. *Sapota*. ORD. *Sapotaceæ*. A monotypic genus. The species is the plant described in Vol. III. as *Sapota Achras*. *See also* **Sideroxylon.**

ACHROANTHES. A synonym of **Microstylis** (which *see*).

ACIDANTHERA (from *akis*, a cusp, and *anthera*, an anther; the anthers are cuspidate). SYN. *Sphærospora*. ORD. *Irideæ*. A genus consisting of seventeen species of stove and greenhouse perennials, natives of tropical and South Africa. Flowers few, loosely spicate; perianth-tube usually long, cylindrical, slightly dilated upwards, the segments sub-equal; stamens unilateral, inserted at or a little below the throat; spathe-valves like those of *Gladiolus*, green, long, lanceolate. Leaves linear. Rootstock a tunicated corm.

A. bicolor is one of the three species at present introduced which is upon the market. Although not quite hardy, still in favoured soils and situations in the south of England its culture may be attempted, treating it

Acidanthera—*continued.*

much on the lines of Ixias, which it approaches. It makes a very good pot-plant.

A. æquinoctialis (Equinoctial).* *fl.* about six in a distichous spike; perianth-tube 5in. to 6in. long, the limb 2in. in diameter, the segments white, with an acute, purple spot at base; outer spathe-valves 3in. to 4in. long. November. *l.* many, superposed, ensiform, 1ft. to 1½ft. long, strongly ribbed. Stem stiffly erect, 3ft. to 4ft. high. Corm large, depressed-globose. Sierra Leone, 1893. This requires a warm house. (B. M. 7393.)

A. bicolor (two-coloured). *fl.* few, in a very lax spike; perianth white, with a slender tube 4in. to 5in. long, the segments acute, 1¼in. to 1½in. long, the three lower ones conspicuously spotted with purple at the throat. Stem simple. Corm globose, ½in. in diameter. Abyssinia, 1896. Hardy. (G. C. 1896, xx., p. 393.)

A. capensis (Cape). The correct name of *Tritonia capensis*.

ACINETA. Syn. *Neippergia*. This genus comprises about eight species, all natives of tropical America. Though classed as cold-growing Orchids, the Acinetas thrive more satisfactorily in an intermediate temperature, especially during the dull winter months of the year. They require a liberal amount of moisture at the root during the growing season, but care must be taken to avoid stagnation, which causes the potting compost to decay, whereby the roots and the general health of the plant are affected, often leading to destruction. Syringing and damping overhead must also be done with discretion, and should only be attempted in bright, dry weather. It should always be done sufficiently early in the day to enable the foliage to become dry again before the evening, when a fall of temperature sets in. Excessive accumulation of moisture in the hearts of the young growths must also be strictly guarded against, or they will quickly rot off. Where accumulated moisture is observed, the plant should be held upside down, and by gently tapping the growth affected the moisture will be dispersed. These precautions are especially necessary when the plants are grown under cool conditions, or suspended in a house where the sash-bars are not properly grooved to carry off the condensed moisture. Propagation is effected by division of the pseudo bulbs, preferably when the new roots are emitted from the base of the newly made growths. Purchase of Imported plants is, however, by far the most satisfactory way of increasing the stock. To the species described on p. 14, Vol. I., the following should be added:

A. Hrubyana (Hruby's). *fl.* ivory-white, disposed in loose racemes; lip marked with a few purple spots, and having narrow, erect side lobes. Colombia, 1882. A fine and distinct species.

A. Humboldtii fulva (fulvous). *fl.* tawny-yellow, dotted all over with purplish-brown; lip of a brighter yellow, spotted with dark purple. A handsome variety. (B. M. 4156.)

A. H. straminea (straw-coloured). *fl.* pale straw-yellow, with very few spots. Colombia.

A. superba (superb). A synonym of *A. Humboldtii*.

A. Wrightii (Wright's). A synonym of *Lacæna spectabilis*.

ACINOS. Included under **Calamintha** (which *see*).

ACIOTIS. Syn. *Spennera*. About twenty-six species of this genus, natives of the West Indies and tropical America, have been described.

ACIPHYLLA. Syn. *Gingidium* (of F. Mueller). This genus includes about a score of species, natives of New Zealand and Australia. To those described on p. 14, Vol. I. (both of which are called "Wild Spaniard" by settlers), the following should be added:

A. Lyalli (Lyall's). *fl.* white; inflorescence long and contracted; female umbels almost concealed in the tumid sheaths of the bracts; male umbels on spreading, branched peduncles. *l.* simply pinnate or trifoliolate; leaflets rigid, pungent, 4in. to 6in. long, ¼in. broad. New Zealand, 1889.

ACIS. This genus is included by J. G. Baker under **Leucoium** (which *see*), the specific names remaining unchanged. *A. grandiflorus* is, however, regarded as merely a variety of *A.* (*Leucoium*) *trichophyllus*.

A. roseus longifolius (long-leaved). This differs from the type in its larger flowers, longer leaves, and more floriferous habit. Corsica, 1886.

ACISANTHERA. Syn. *Uranthera*. According to the "Genera Plantarum," this genus embraces about fourteen species of glabrous, pilose, or slightly hispid, stove herbs (often annuals) or sub-shrubs, inhabiting the West Indies and tropical South America. Flowers purple and pink, terminal and axillary, shortly paniculate; calyx with a hemispherical or campanulate tube and four or five acuminate lobes as long as the tube; petals four or five, obovate or orbicular; stamens eight to ten, unequal. Leaves almost sessile, entire or serrated. *A. quadrata* is probably the only species in cultivation.

ACMELLA. Included under **Spilanthes** (which *see*).

ACMENA. Bentham and Hooker include this genus under **Eugenia**.

A. floribunda. Synonymous with the plant correctly described in Vol. I. as **Eugenia Smithii**. (B. M. 5480.)

ACOKANTHERA. This is the correct name of the genus described on p. 63, Vol. IV., as **Toxicophlæa** (which *see*).

ACONITUM. According to Bentham and Hooker, the number of distinct species is only about eighteen, many of the plants described on pp. 15-17, Vol. I., being mere varieties. They are chiefly mountain plants, spread over the greater part of Europe and Central Asia, very few species being found in North America. *A. Napellus* is a British species.

Though Aconites will grow fairly well almost anywhere, they are best accommodated in a deep, fairly rich soil, and in partial shade. Their spikes of flowers look remarkably well in a mixed border of good width. They are best divided in autumn. The following are the only additions calling for mention:

Sect. I.—Roots Tuberous.

A. californicum (Californian). A garden synonym of *A. Fischeri*.

A. decorum (neat). A garden synonym of *A. Cammarum*

A. dissectum (dissected). This plant has much in common with *A. Napellus*, but it is more hairy. The principal difference is exhibited in the narrower helmet of the flowers. Himalayas, 1885. (R. G. 1886, p. 226, f. 16.)

A. Fischeri (Fischer's). *fl.* pale blue, large, puberulous, many in a straight, erect raceme. October. *l.*, cauline ones petiolate, tripartite; segments cuneate, trifid, incised-lobed. Europe, North America, &c., 1886. Plant erect, robust. (B. M. 7130.) Syn. *A. californicum* (of gardens).

A. hamatum (hooked). A synonym of *A. variegatum*.

A. hebegynum, of gardens. A synonym of *A. variegatum bicolor*.

A. longebracteatum (long-bracted). A fine garden form of *A. Napellus*.

A. Sterckianum (Sterck's). A synonym of *A. intermedium*.

Sect. II.—Roots Fibrous.

A. Fortunei (Fortune's). The correct name of *A chinense* (B. M. 3852; P. M. B. v., t. 3). Syn. *A. sinense*, of Lindley (P. F. G. i., p. 187, f. 116.

A. sinense (Chinese), of Lindley. A synonym of *A. Fortunei*.

A. grandiflorum (large-flowered). A synonym of *A. vulparia*.

ACRATHERUM. A synonym of **Arundinella** (which *see*).

ACRIDOCARPUS. Syn. *Anomalopteris*. This genus embraces about a dozen species of stove or greenhouse trees and shrubs, natives of tropical and South Africa, Madagascar, and Arabia. Flowers yellow, racemose or rarely corymbose; calyx deeply five-cleft; petals unequal, clawed, almost entire; stamens ten, all perfect; racemes or corymbs terminal and lateral, often paniculate. Leaves alternate, rarely opposite, entire, often glandular beneath, without stipules.

ACROCHÆNE (probably from *akros*, top, and *chaino*, to gape; reason not obvious). Ord. *Orchideæ*. A small genus (two species) of stove, epiphytal Orchids, natives of tropical Asia. Sepals spreading, sub-equal; petals small, lacerated; lip erect, shorter than the sepals, with a short claw; scape lateral, erect; raceme long, lax. *A. Rimanni* is said to be grown in this country; it requires

Acrochæne—*continued.*

similar culture to **Cœlogyne** (which *see*), and should be grown in an intermediate temperature.

A. Rimanni (Rimann's). *fl.* nearly equal to those of *Dendrobium Kingianum*; sepals lilac-purple, the lateral ones connate; petals lilac-purple, short, oblong, denticulate; lip very dark purple, having each lateral lobe semicircular and denticulate. 1882.

ACROCLINIUM. Bentham and Hooker include this genus under **Helipterum** (which *see*), the correct name of *A. roseum* being *H. roseum*.

A. roseum album flore-pleno (double-flowered). A pretty, double-flowered variety.

ACRONYCHIA. Syns. *Cyminosma*, *Gela*, *Huonia*, *Jambolifera*. About fifteen species are referred to this genus; they are stove or greenhouse trees, natives of tropical Asia, Australia, and Oceania. Corymbs pedunculate, axillary and termimal. Leaves opposite or alternate, with one to (rarely) three leaflets; leaflets ample, entire, pellucid-dotted. The plant formerly known as *A. Cunninghami* now forms the monotypic genus **Medicosma** (which *see*). To the information given on p. 18, Vol. I., the following should be added:

A. lævis (smooth). *fl.* white, in di- or trichotomous cymes, usually shortly pedunculate. July. *l.* irregularly opposite or alternate, consisting of a single leaflet, obovate-oblong to oblong-elliptical, obtuse, 1½in. to 4in. long. Australia, 1824. Syn. *Cyminosma oblongifolium* (B. M. 3222).

ACRONYCTA PSI. *See* **Grey Dagger Moth,** and also **Pear Insects.**

ACROPHYLLUM. Syn. *Calycomis* (of Don). Tribe *Cunonieæ* of Ord. *Saxifrageæ*. This genus is monotypic, the species being *A. venosum* (B. ii., t. 95), described in B. M. 4050 as *A. verticillatum*.

ACROSSANTHES. A synonym of **Vismia** (which *see*).

Fig. 9. Acrostichum aureum.

ACROSTICHUM. Including *Hymenolepis*, *Jenkinsia*, *Leptochilus*, *Macroplethus*, *Microstaphyla*, *Photinopteris*, *Pœcilipteris*, and *Teratophyllum*. The species number upwards of 180. The genus is exceedingly rich in plants of decorative value. Some of the strongest-growing kinds are particularly adapted for covering trunks of Tree-Ferns, walls, columns, &c., which they ascend by means of the extension of their rhizomes. In such situations they produce a very striking effect, hiding as they do unsightly supports or other equally objectionable objects. As before stated, in the work proper, the species with long fronds are most valuable for growing in hanging-baskets; while for most of the species, with entire or simple fronds, pot-culture must necessarily be resorted to. In whatever way they are grown, Acrostichums

Acrostichum—*continued.*

require a liberal supply of water at the roots; consequently, the compost used must be of a very porous nature. A mixture of two parts fibrous peat, one part chopped sphagnum, and one part coarse silver sand, will be found to suit nearly all known species.

One of the finest species in the large genus is *A.* (*Chrysodium*) *aureum* (see Fig. 9), which requires the temperature of a warm house, and to be treated as an aquatic. It should be potted in equal parts fibrous peat and loam, and, provided there is abundance of heat in the house, it will form a very striking object if the lower part of the pot can be kept in water.

Fig. 10. Acrostichum crinitum.

The Elephant's-Ear Fern (*A.* (*Hymenodium*) *crinitum*), has a very appropriate popular name, as the fronds (Fig. 10) have more than a fanciful resemblance to the ears of the elephant. A mixture, composed of two parts peat and one part chopped and partly-decayed sphagnum, is what this species prefers; but in such a compost care must be taken that it does not get treated too liberally with water at the roots, as in that case it is not unusual to find the fleshy fronds covered with circular marks, having all the appearance and transparency of oily spots, which gradually extend over their surface, and completely destroy it. This peculiar condition we have not found in any other species except Platyceriums, all of which are subject to it to the same extent; it is invariably due to stagnation at the roots. The most efficacious treatment consists in entirely removing the soil from the roots, by washing them, and re-potting in a smaller pot. After this operation, very little water should be allowed, and even when in good health, unless growing in great heat, *A. crinitum* should be watered only when showing signs of flagging.

Two or three other representatives of this interesting genus require special treatment if the best results are to be obtained. *A. peltatum* is one. Unless kept in a place naturally moist, this elegant little Fern, which does not like having its roots disturbed more than is necessary, and which, furthermore, requires a liberal supply of water *all the year round*, is considered a somewhat shy

Acrostichum—*continued.*

grower. When, however, in a place in which a permanently moist atmosphere may be depended upon, it grows freely in a mixture, in about equal proportions, of partly-decayed leaf-mould, fibrous peat, and silver sand. Also impatient of root-disturbance is the beautiful *A. scolopendrifolium*, which thrives best when pot-bound, providing the watering is carefully done.

FIG. 11. ACROSTICHUM AUBERTII.

A. scandens, though usually regarded as a stove fern, grows very well in the intermediate house, where the winter temperature occasionally falls below 50deg. Fahr. It prefers a compost of an open nature made of fibrous loam, fibrous peat, partly-decayed leaf-mould, and silver sand, in equal parts, with abundance of water at the roots all the year round. To the species, &c., described on pp. 18-20, Vol. I., the following should be added. Except where otherwise indicated, stove treatment is required.

FIG. 12. ACROSTICHUM CŒNOPTERIS.

Acrostichum—*continued.*

A. Aubertii (Aubert's). *rhiz.* woody, short-creeping, prostrate, densely scaly. *barren fronds* 1ft or more in length, borne on stems 4in. to 6in. long, clothed with squarrose, linear, brown scales. *fertile fronds* 2in. to 3in. long, suddenly narrowed at base, borne on stems 6in. to 9in. long. Bourbon, Natal, &c. A distinct species, resembling *A. viscosum*. See Fig. 11.

A. Burchellii (Burchell's). *rhiz.* short, woody, with small, dark brown scales. *sti.* 8in. to 12in. long, erect, nearly naked. *barren fronds* 1ft. to 2ft. long, ¾in. to 1¼in. broad, the point very acute, the lower part very gradually narrowed, naked and glossy on both sides. *fertile fronds* much smaller. Brazil.

A. buxifolium (Box-leaved). A variety of *A. sorbifolium*.

A. Cœnopteris (Cœnopteris). *rhiz.* woody, densely covered with rusty scales, trailing, as thick as a finger. *sti.* straw-coloured, 6in. to 12in. long, scaly below. *barren fronds* 2ft. to 3ft. long, about 1in. broad, simply pinnate; pinnæ coriaceous, 4in. to 8in. long, 1½in. broad, entire, toothed. *fertile fronds* narrower, bipinnate. Mexico. A strong-growing, stove or greenhouse species, better adapted for growing on partly-decayed branches of trees than for pot culture. See Fig. 12. SYN. *Soromanes serratifolium*.

A. conforme alatum (winged). This "has a more distinct haft to the frond" (Baker). There are several other varieties.

A. contaminans (contaminating). A form of *A. virens*.

FIG. 13. ACROSTICHUM DRYNARIOIDES.

A. costatum (ribbed). A form of *A. virens*.

A. crassinerve (thick-nerved). A variety of *A. latifolium*.

A. crispatulum (slightly curled). A form of *A. virens*.

A. cultratum (knife-shaped). *rhiz.* wide-creeping or long-trailing. *barren fronds* 6ft long, bright green; pinnæ ligulate, 6in. to 8in. long, 1½in. broad, cut down to a narrow wing into undivided, close, blunt lobes. *fertile fronds* having pinnæ more distant and only ¼in. broad. Solomon Islands. One of the most gigantic species in cultivation. SYN. *Chrysodium cultratum*.

A. decoratum (decorative). *cau.* stout, furnished with bright brown scales ¾in. long. *barren fronds* 1ft. or more in length, 3in. to 4in. broad, coriaceous, bright green, acute, rounded at base, the edges densely fringed with squarrose, brown scales. *fertile fronds* nearly as large as the barren ones. West Indies, &c. A handsome species.

A. drynarioides (Drynaria-like). *fronds* several feet long, 1ft. or more in breadth, stalkless; upper part furnished with Lomaria-like pinnæ quite 1ft. long, and which, although adnate to the rachis, break away from it readily. Penang and the Solomon Islands. A peculiar species. See Fig. 13. SYN. *Photinopteris drynarioides*.

A. Harlandii (Harland's). *sti.* firm, glossy, 1in. to 1½in. long, chestnut-brown, scaly at base. *barren fronds* usually entire, but sometimes having a spathulate terminal pinna 1ft. long and 3in.

Acrostichum—*continued.*

broad and one or two similar but smaller ones on each side, usually connected at the base, all coriaceous. *fertile fronds* similar, but with much smaller pinnæ. Hong-Kong and Formosa. A handsome species when well grown

A. hybridum (hybrid). *rhiz.* woody, densely clothed with dark chestnut-brown, crisped scales. *sti.* firm, erect, scaly, 6in. to 9in. long. *barren fronds* 6in. to 12in. long, about 2in. broad, acuminate, rounded at base, sub-coriaceous, scaly at the edges. *fertile fronds* much smaller. Tropical Africa. SYN. *A. Linbergii.*

A. latifolium. Other varieties of this species are: *angustifolium, callæfolium, conopodium, crassinerve,* and *Sartorii.*

A. laurifolium (Laurel-leaved). *cau.* firm, erect, naked. *fronds* pinnate, 3ft. long, 1½ft. broad, coriaceous; barren pinnæ 6in. to 9in. long, 1½in. broad, gradually narrowed from the cordate base, sharply but finely toothed; fertile ones a little longer, but seldom more than ¼in. broad, the lower ones 1in. to 2in. apart. Philippines, &c. A handsome species. SYN. *Stenochlæna laurifolia.*

A. laurifolium, of Thouars. A form of *A. conforme.*

A. Lechlerianum (Lechler's). *rhiz* woody, wide-scandent, scaly. *sti.* 6in. to 12in. long, firm, erect, scaly downwards. *fronds* 3ft. to 4ft. long, 1ft. to 1½ft. broad, the barren one quadripinnatifid; lower pinnæ 6in. to 9in. long, 4in. to 5in. broad; pinnules close, lanceolate; segments oblong, deeply lobed; rachises pubescent; fertile pinnules narrower, distant, the segments oblong-cylindrical, with a space between them, the lower ones rather beaded. Peru and Ecuador, 1886. SYN. *Polybotrya Lechleriana* (G. C. n. s., xxv., pp. 400-1).

A. Linbergii (Linberg's). A synonym of *A. hybridum.*

A. Lingua (tongue-like). This species differs from *A. latifolium* in the following points: *rhiz.* firm, wide-creeping or long-trailing, covered with small, ovate, dark brown scales. *fronds* coriaceous, suddenly narrowed at base. Tropical America. SYN. *Elaphoglossum Lingua.*

A. magnum (large). *rhiz.* sub-erect, the basal paleæ small, nearly black. *sti.* tufted, those of the barren fronds 3in. to 4in. long. *barren fronds* 2ft. to 3ft. long, 1½in. to 2in. broad, narrowed gradually to both ends, the paleæ of the upper surface numerous, minute, whitish, those of the under side ferruginous. British Guiana, 1880. SYN. *Elaphoglossum magnum.*

A. melanopus (black-footed). *rhiz.* short-creeping, densely covered with long, blackish or dark chestnut scales. *sti.* 2in. to 3in. long, also densely scaly. *barren fronds* 5in. to 8in. long, 2in. broad, elliptic-oblong, acute, rounded at base, coriaceous,

FIG. 14. ACROSTICHUM MUSCOSUM.

Acrostichum—*continued.*

scaly on the margins. Venezuela. SYN. *Elaphoglossum melanopus.*

A. muscosum. This beautiful species is illustrated in Fig. 14.

FIG. 15. ACROSTICHUM OSMUNDACEUM.

A. osmundaceum. Fig. 15 shows this handsome American species.

A. peltatum gracillimum (very slender). *fronds* larger and much more finely divided than in the type, than which it is of easier culture. Stove or greenhouse. The typical *A. Peltatum* is shown in Fig. 16.

A. Plumieri (Plumier's). A variety of *A. villosum.*

A. Prestoni (Preston's). *rhiz.* thick, woody, short-creeping. *sti.* 6in. to 9in. long, covered with brownish-black scales. *barren fronds* simple, 1in. to 1½in. long, 2in. broad, lanceolate, bordered on their whole length with a dense, persistent fringe of brown scales. Rio de Janeiro.

A. proliferum (proliferous) A form of *A. virens.*

A. Quoyanum (Quoy's). A variety of *A. repandum.*

A. repandum (uneven). *barren fronds* very decorative, 1½ft. to 2ft. long, 8in. to 12in. broad, sometimes elongated and rooting; pinnæ numerous, soft in texture, the lower ones 6in. long, 1in. broad. *fertile fronds* having stalked, bowed pinnæ 2in. to 3in. long. Tropical Asia. A robust species. SYN. *Gymnopteris repanda.*

A. r. Quoyanum (Quoy's). *fronds* having the pinnæ lobed half-way down or more, the lobes toothed.

A. Sartorii (Sartor's). A variety of *A. latifolium.*

A. setosum (bristly). A variety of *A. villosum.*

A. Smithii (Smith's). A variety of *A. sorbifolium.*

A. sorbifolium buxifolium (Box-leaved). *fronds* having the pinnæ sessile, coriaceous, dark green, oblong, very obtuse, less than 1in. long, ¼in. broad.

A. s. Smithii (Smith's). *fronds* sessile, tripinnatifid; pinnules numerous, small, dichotomously forked.

A. s. variabile (variable). *fronds* having the lower pinnæ deeply pinnatifid, with round, dented lobes.

A. tenuifolium (slender-fronded). A synonym of *Lomaria tenuifolia.*

A. terminans (terminating). A form of *A. virens.*

A. tomentosum (downy). *rhiz.* woody, with dense, black, fibrillose scales. *sti.* 3in. to 5in. long, rigid, erect, densely ciliated, scaly, the upper scales white. *barren fronds* 1ft. or more in length, 1in. to 1½in. broad, bluntish at apex, the lower part gradually narrowed, thick but flaccid, both sides matted with scales. *fertile fronds* narrower, on stems 1ft. or more in length. Bourbon.

A. undulatum (waved). A variety of *A. villosum.*

A. variabile (variable). *rhiz.* wide-creeping. *sti.* of barren fronds wanting or even 6in. long. *barren fronds* 6in. to 18in. long, 1½in. to 3in. broad, oblong-spathulate, with a very long, gradually narrowed

Acrostichum—*continued.*

haft, blunt or acute, entire, naked. *fertile fronds* 6in. to 12in. long, ¼in. to ¼in. broad, on stipes often 1ft. long. India.

A. variabile, of Fée. A variety of *A. sorbifolium.*

A. villosum. This species is very variable; among the principal deviations from the type may be named *A. Plumieri*, *A. setosum*, and *A. undulatum.*

A. virens (green). *rhiz.* hard, woody, short-creeping. *sti.* firm, erect, without scales. *barren fronds* coriaceous, 2ft. to 3ft. long, often 1ft. broad; lateral pinnæ 6in. to 8in. long, about 1in. broad, the edges bluntly lobed or sometimes sinuate; terminal one twice as long, generally rooting at the point. Tropical Asia. SYN. *Gymnopteris virens.* A very robust and decorative species, of which the following are merely forms: *A. contaminans*; *A. costatum*, pinnæ 8in. to 12in. long, 2in. to 3in. broad, tinged with red; *A. crispatulum*, pinnæ narrow, crisped, very coriaceous; *A. proliferum*, pinnæ broad; and *A. terminans.*

FIG. 16. ACROSTICHUM PELTATUM.

ACROTREMA (from *akros*, a point, and *trema*, a perforation; the pollen is shed through a hole at the tip of the anthers). ORD. *Dilleniaceæ.* A genus consisting of about a dozen species of almost stemless, stove or greenhouse herbs with a perennial or woody rhizome, natives of India, and especially plentiful in Ceylon. Flowers yellow; sepals five, spreading; petals five; filaments more or less aggregated in three bundles; peduncles axillary, loosely few-flowered or racemosely many-flowered. Leaves ample, pinnately lobed or dissected. For culture of *A. Walkeri*, the only species introduced, *see* **Delima.**

A. Walkeri (Walker's). *fl.* in very short, axillary racemes; stamens about fifteen; pedicels 1in. to 2in. long, laxly villous. June. *l.* narrowly obovate-oblong, bullate, 2in. to 4in. long, ¼in. to 1in. broad, sharply toothed, auricled at base, dull red and hairy on the veins beneath. Ceylon, 1851. Warm greenhouse. (B. M. 5353.)

FIG. 17. ACTINIOPTERIS RADIATA

ACTÆA. This genus embraces only the two species described on pp. 20-21, Vol. I., *A. spicata* (Herb Christopher) being broadly distributed over North temperate regions and indigenous in Britain. Several plants formerly included here are now referred to **Cimicifuga.**

A. dioica (diœcious). A synonym of *Xanthorrhiza apiifolia.*

A. palmata (palmate). A synonym of *Trautvetteria palmata.*

ACTINELLA. *Picradenia* is synonymous with this genus.

ACTINIDIA. About eight species, natives of the Himalayas, China, and Japan, are included hereunder.

ACTINIOPTERIS. The very decorative and attractive *A. radiata* (Fig. 17) and *A. r. Australis* (Fig. 18), with their striking Palm-like fronds, are erroneously considered as very difficult to manage, consequently they are not grown as extensively as they really deserve; they are most interesting, though of comparatively small dimensions. Failure in their culture must, in many cases, be attributed to the excessive heat to which they are subjected, which causes them to get "thrippy" and lose their vitality; but when kept in a temperature of 60deg. in the winter, raising to 70deg. in the summer, with constant moisture around them, they remain perfectly clean and healthy. They thrive best in fibrous peat, fibrous loam, broken in small pieces, coarse silver sand, and small crocks, in about equal proportions. It is also absolutely necessary that the pots in which these Ferns are grown should be half-filled with crocks, so as to insure perfect drainage, for they require frequent and abundant waterings to keep their roots in a permanently moist state all the year round. Being devoid of rhizomes or stems of any kind, Actiniopteris are usually propagated from spores, which germinate very freely when sown on a compost of brick-dust mixed with a little loam, and kept in a warm, close case. They may also be increased by the division of the crowns; but this operation, which should be done not later than the beginning of March, is of a somewhat risky nature, and requires a certain amount of experience and a good deal of attention to ensure the separate pieces getting established.

FIG. 18. ACTINIOPTERIS RADIATA AUSTRALIS.

ACTINOCARPUS. The correct name of this genus is **Damasonium** (which *see*).

ACTINOCHLOA. A synonym of **Bouteloua** (which *see*).

ACTINOLEPIS. SYN. *Hymenoxys.* This is the correct name of the genus described on p. 247, Vol. III., as *Ptilomeris*, and *P. coronaria* is properly known as *A. coronaria.*

ACTINOMERIS. SYN. *Ridan.* About nine species, natives of North America (including Mexico) comprise this genus.

A. alata. The correct name is *Verbesina occidentalis.*

A. procera is synonymous with *A. squarrosa.*

ACTINONEMA ROSÆ (SYN. *Asteroma radiosum*). A fungus responsible for the irregular black spots frequently seen on the foliage of roses in summer, causing it to turn yellow and prematurely fall in very bad attacks. Later these spots increase in size, and assume a more definite rounded form. Beyond removing the leaves and bare shoots and burning them little can be done, as the mycelium is in as well as upon the foliage. Where Roses are grown, and the disease was known to exist the previous season, it will be well to spray in spring, using a weak solution of **Bordeaux Mixture** (which *see*).

ACTINOSTROBUS (from *aktin*, a ray, and *strobos*, a cone; in allusion to the disposition of the cone-scales). ORD. *Coniferæ.* A small genus (two species) of greenhouse,

Actinostrobus—*continued.*

densely-branched shrubs, natives of South-western Australia. Flowers monœcious; amenta on very short peduncles, or almost sessile, in the axils. Cones ovoid-globular or acuminate, the six inner much-enlarged scales becoming almost valvate in a single whorl, with six or twelve of the outer barren scales more or less enlarged and closely appressed or adnate to their base. Leaves in whorls of three, very short, thick, rigid and acute, or those on the smaller branches appressed, obtuse, and three-angled. Only one of the species is known in our gardens. For culture *see* **Callitris** (to which this genus is closely allied).

A. pyramidalis (pyramidal). *fl.*, amenta one to three lines long. *cones* ½in. in diameter or more. *l.*, lower ones somewhat acicular and three to four lines long; those of the main branches acute and spreading, ⅛in. or less in length; those on the smaller branchlets still shorter, appressed and obtuse. A densely-branched, pyramidal, glabrous shrub.

ACTINOTUS. SYN. *Eriocalia.* Seven species are included in this genus. *A. Helianthi* is figured in B. R. 654, and as *Eriocalia major* in S. E. B. ii., t. 38.

ACULEATE HYMENOPTERA. This is a most important section of the Order *Hymenoptera*—an order which, judged by the intelligence displayed by the majority of its members, should be placed at the head of those which go to make up the Class *Insecta*. The insects falling under the above denomination are those which bear a sting. Many of them are amongst the most familiar of garden insects—Social Bees, Social Wasps, and Ants, for instance—and play a very important part in the economy of Nature. There are still others inhabiting gardens which are more readily passed over, useful though they be. Such are the Solitary Wasps, which provision their nests with caterpillars (usually of noxious species of moths) and spiders. Of these there are no less than twenty-nine species in two genera, *Eumenes* and *Odynerus*, mostly inhabiting sandy localities. All are not equally common. They are small in comparison with the Social Wasps, but prettily banded with yellow on black. They are further distinguished by a more or less narrow pear-shaped body, and by the tarsal hooks, which are simple in the Social and hooked in the Solitary Wasps.

Aculeate Hymenoptera are thus divided by Mr. S. Saunders: *Heterogyna*, *Fossores*, *Diploptera*, and *Anthophila*. The *Heterogyna*, or Ants, are insects whose economy is fairly well understood, and whose conformation is familiar. They are injurious insects to the gardener. The *Fossores*, or diggers, are friends; the insects comprising it usually burrow in the sand, and are carnivorous. Some species are frequently mistaken for Wasps, though they should readily be distinguished therefrom by the disposition of the wings, which in Wasps are folded (hence *Diploptera*) longitudinally when at rest; whereas those of the *Fossores* never are.

The *Diploptera*, or Wasps, are further sub-divided into *Vespidæ* and *Eumenidæ*. The former includes the Social Wasps, all of which, save the Hornet, are pests to the gardener, the good they do being quite discounted by the injury to the ripening fruit; and the latter the Sand Wasps, all of which are useful to the gardener.

Another useful genus in this group is that known as *Ammophila*. These insects have a markedly long petiole connecting the abdomen with the other parts of the body, and are in length from ½in. to ¾in., and variously coloured. The long petiole ought, however, to distinguish them as friends to the gardener; for like their relatives the Solitary Wasps, they furnish their nests with caterpillars, &c., to feed the larvæ when they hatch out. Then there are others which provision them with Aphides, or their near relatives—for instance, members of the genera *Psen* and *Mimesa*.

The last section of the Aculeates to be noticed is *Anthophila*. This contains not only the Hive Bee, but also many others which are not so well known, or their economy so perfectly understood. There are Social Bees

Aculeate Hymenoptera—*continued.*

and Solitary Bees, as there are Social Wasps and Solitary Wasps. Some of the Solitary Bees, in particular, are much maligned by gardeners and others, and are credited with injury they never inflict. *Anthidium manicatum* is a case in point. This is a locally distributed insect which is popularly supposed to destroy wood by boring into it; as a matter of fact this latter is untrue. What the Bee really does is to tenant some hole which has previously been occupied by another insect, and industriously line its nest with woolly substances laboriously collected from various parts of plants. It is deftly rolled up and then carried away. To this section also belongs the Corder Bees (certain *Bombus* species) whose nests are built upon the ground, and then carefully protected by grass, moss, or what not. These latter are Social Bees.

Other Solitary Bees unfavourably regarded by gardeners are the Leaf-Cutters, *Megachile circumcincta* and *M. centuncularis*. Clever insect-architects though they be, and undeniably ingenious, as they, with unerring aim and mathematical accuracy, remove from Rose-leaves (see Fig. 19), or it may be from Scarlet Pelargonium flowers, almost elliptical pieces that will fit into the required space of their nest lining, and carry it off, they are undesirable in gardens. The work is always that of the female, as the male takes no part in the provision of a home. Usually the insect steers clear of the midrib of the leaflet, but occasionally a portion of this also is removed. The piece of foliage is gradually detached with the insect in position on it, though the actual severance is made while she is on the wing. The whole operation occupies but very few seconds; while the pieces removed are identical in size. The former is a sand-loving insect, and local in its distribution, although in Surrey it may be plentifully found. For Marechal Niel Rose foliage it has a particular affection. The latter is common, and occasionally lays the Scarlet Pelargonium flowers under contribution to line its nest.

FIG 19. ROSE FOLIAGE ATTACKED BY LEAF-CUTTING BEES.

ADA. These charming orange-scarlet flowered Orchids thrive well under similar conditions to that recommended for **Odontoglossum.** They do best grown in pots, which should be placed within a reasonable distance of the roof-glass, where the plants can obtain a liberal amount of light and a free circulation of air whenever the outside conditions permit. Fibrous peat and living sphagnum make a good potting compost. Adas require a liberal supply of moisture at the root at all seasons of the year. To the species described on p. 22, Vol. I., the following should be added:

A. Lehmanni (Lehmann's). *fl.*, sepals and petals orange; lip white, with a yellow callus. Colombia, 1891. This is distinguished from *A. aurantiaca* by its white lip, shorter, broader, and darker green leaves everywhere marbled with grey, and more rigid habit; further, the flowers are produced in the summer.

ADAMIA. The three plants described under this name are all referred by Bentham and Hooker to one species, forming the genus **Dichroa** (which *see*).

ADAM'S FLANNEL. *See* **Verbascum Thapsus.**

ADANSONIA. SYN. *Ophelus.* Two species form this genus; both are stove trees, with dwarf trunks of enormous girth. Flowers white, large, pendulous; calyx ovoid or oblong, deeply five-cleft; petals five, obovate or oblong; peduncles axillary, one-flowered. Fruit oblong, woody, indehiscent, containing mealy pulp (Monkey Bread). Leaves digitate; leaflets three to nine, entire.

ADDER'S VIOLET. *See* **Goodyera pubescens.**

ADELASTER ALBIVENIS. The plant exhibited and described under this name (Proc. R. Hort. Soc., 1861, p. 568; I. H. t. 320) is probably some kind of *Eranthemum.*

ADELGES ABIETIS. *See* **Spruce-Gall Aphis.**

ADELIA (from *a*, not, and *delos*, visible; in allusion to the minute parts of the fructification). SYN. *Ricinella.* ORD. *Euphorbiaceæ.* A genus embracing about seven species of stove shrubs, natives of the West Indies and Central America. Flowers small, dicœcious, apetalous. Leaves alternate or crowded at the nodes, entire, shortly petiolate. A few of the species have been introduced, but they are of no particular horticultural value.

ADELMANNIA. A synonym of **Borrichia** (which *see*).

ADELOBOTRYS. SYN. *Truncaria.* Eight species, natives of Mexico, Colombia, North Brazil, Guiana, and Jamaica, have been referred to this genus.

ADENANDRA. SYN. *Glandulifolia.* Of this genus there are upwards of twenty-one species. Several of them were formerly classed under *Diosma; e.g., A. fragrans* (B. M. 1519), *A. umbellata speciosa* (B. M. 1271), and *A. uniflora* (B. M. 273).

A. linearis is a variety of *A. uniflora.*

ADENANTHERA. SYN. *Stachychrysum.* Three or four species, natives of tropical Asia, Africa, and Australia, are included in this genus, one being broadly cultivated in the warmer regions of the globe.

ADENEMA. A synonym of **Enicostema** (which *see*).

ADENILEMA. A synonym of **Neillia** (which *see*).

ADENOCARPUS. About eight species, natives of South and South-west Europe, tropical and North Africa, and the Canary Islands, are included in this genus; several of them were formerly classed under *Cytisus.* To those described on p. 23, Vol. I., the following should be added:

A. Anagyrus (Anagyris). A synonym of *A. frankenioides.*

A. decorticans (barkless).* *fl.* bright yellow, Pea-like, in short, compact racemes. May. *l.* densely set, two or three-foliolate; leaflets linear, soft, dark green. Spain, 1883. A beautiful, half-hardy, evergreen shrub, having the general aspect of Furze. (G. C. n. s., xxv., p. 725; Gn., 1886, p. 572; R. H. 1883, p. 156.)

ADENOCREPIS. A synonym of **Baccaurea** (which *see*).

ADENOPHORA. SYN. *Floerkia* (of Sprengel). Gland Bellflower. This genus embraces about ten distinct species, natives of temperate Asia and Western Europe.

A. coronata (crowned). A synonym of *A. intermedia.*

A. Potanini (Potanini's). *fl.* pale blue, bell-shaped, in elegant, slender spikes. *h.* 2½ft. Shrubby.

ADENOPODIA. A synonym of **Entada** (which *see*).

ADENOSMA (from *aden*, a gland, and *osme*, smell; alluding to the glands in most of the species which exhale a Mint-like odour). SYNS. *Anisanthera* (of Griffith), *Pterostigma.* ORD. *Scrophularineæ.* A genus embracing

Adenosma—*continued.*

about seven species of stove, glandular-pubescent or villous herbs, often aromatic, natives of the East Indies, Eastern Asia, the Malayan Archipelago, and Australia. Flowers blue, on very short pedicels; calyx five-parted; corolla tube cylindrical, the posterior lip erect, entire or emarginate, the anterior one spreading, entire or three-lobed; stamens four, included. Leaves opposite, wrinkled, crenulate. Only one species is known to cultivation. It thrives in a compost of sand and peat, and may be increased by seeds or by divisions.

P. grandiflorum (large-flowered). *fl.* violet, the lower ones axillary, the upper ones racemose; calyx ¼in. long; corolla 1in. long; pedicels shorter or longer than the calyx. *l.* petiolate, ovate, 1½in. to 2in. long, or the lower ones larger. *h.* 1ft. to 2ft. China, 1845. SYN. *Pterostigma grandiflorum* (B. R. 1846, t. 16).

ADENOSTEMMA (from *aden*, a gland, and *stemma*, a crown; in reference to the fruit being crowned by glandular awns). SYN. *Lavenia.* ORD. *Compositæ.* A genus comprising not more than five distinct species, mostly natives of the warmer parts of America, one being broadly dispersed over the globe. Flower-heads white, mediocre or small, homogamous, loosely corymbose, paniculate; florets tubular. Leaves opposite, petiolate, toothed or almost entire. *A. viscosum* (B. M. 2410, under name of *Ageratum strictum*) has been introduced, but is probably lost to cultivation.

ADENOSTYLES (from *aden*, a gland, and *stylus*, a style; in allusion to the long stigmas being covered with warty glands). ORD. *Compositæ.* A genus embracing three or four species of tall, hardy, perennial herbs, natives of Central and Southern Europe. Flower-heads homogamous, mediocre or rather large, disposed in an ample, corymbose panicle; florets purplish or whitish, rather long-exserted; involucre cylindrical-campanulate; receptacle flat, naked. Leaves alternate or radical, long-petiolate, often broad; petioles often dilated into stipule-like auricles at the base. Three species are in cultivation. They thrive in any fairly good soil, and may be increased by seeds or by divisions.

A. albifrons (white-leaved).* *fl.-heads* composed of three to six florets; involucre glabrous; corymb fastigiate. July and August. *l.* reniform-cordate, coarsely and unequally duplicate-toothed, somewhat tomentose beneath. Woody mountains.

A. alpina (alpine). *fl.-heads* composed of three to six florets. *l.* glabrous underneath, or hairy on the nerves; petioles rarely auricled.

A. leucophylla (white-leaved). *fl.-heads* in a compact corymb; florets ten to twenty on a head. *l.* white, tomentose on both sides. High Alps.

ADENOSTYLIS (of Blume). A synonym of **Zeuxina** (which *see*).

ADENOTRICHIA. Included under *Senecio, A. amplexicaulis* being now known as **S. Adenotrichia** (which *see*).

ADESMIA. About 110 species have been referred to this genus, but scarcely more than eighty are entitled to rank as such. To those described on p. 24, Vol. I., the following should be added:

A. balsamica (balsamic). *fl.* golden-yellow, ⅜in. in diameter; racemes terminal, effuse, three- to eight-flowered. March. *l.* 1in. to 1½in. long, shortly petiolate, pinnate; leaflets ten to thirteen pairs, ⅛in. to ¼in. long, sessile, dark green, oblong or cuneately obovate. Branches very slender, leafy. Chili, 1887. A nearly glabrous, excessively-branched shrub, covered with balsamic glands. (B. M. 6921.)

ADHATODA. SYN. *Duvernoia.* This genus embraces half-a-dozen species, natives of India, Africa, and South America. Flowers whitish or purple; calyx five-cleft; corolla having a short tube and a long bilabiate limb; stamens two; bracts and bracteoles spreading, often much exceeding the calyx. Leaves entire. *See also* **Justicia**, under which are now classed several species that were formerly included under *Adhatoda.*

ADIANTUM. Including *Hewardia*. This genus includes upwards of eighty species, "most of which are recognisable from all other Ferns but the typical Lindsayas by the texture, as also by the one-sidedness of their segments, and by the absence of an apparent and distinct midrib in their segments" (Schneider). Stipes and rachises usually black and glossy. Fronds varying from simple to decompound; pinnæ usually truncate, wedge-shaped at base, or dimidiate and soriferous only on the upper margin; veins simple, radiating, forked, anastomosing only in four species (section *Hewardia*).

Adiantums are, as a rule, easy to manage. Plenty of light should be allowed all of them, but, as with nearly all other Ferns, the full rays of the sun should be carefully avoided. A mixture of fibrous peat, or of partly-decayed leaf-mould, loam, and silver sand, in about equal parts, will suit most of them. None of them like to be potted very hard, and watering or syringing overhead, unless it be in a very airy, light, and warm house, is injurious to most of them.

The propagation of all kinds of Adiantums provided with running rhizomes may with advantage be effected by the division of the same, an operation which is best performed from February to April. Species with tufted crowns may also be increased by division, but in their case, and especially when quantities of plants are required, it is safer and more advantageous to depend on spores, which germinate freely, and which usually produce stronger and more shapely plants than those resulting from the division of the crowns. The spores may be sown with perfect safety at all times of the year, although the most favourable season is from January to April, as in that case the seedlings have ample time to produce crowns sufficiently strong to withstand the effects of the following winter.

There is scarcely any need to enlarge upon the many ways in which the Maidenhair Ferns may be utilised for bouquets, wreaths, &c., to refer to their value as decorative subjects, or yet again to their diversity of form and tint, though the last-named are not so well known as the other characteristics. There are numerous dwarf-growing forms of *A. cuneatum* and of *A. Capillus-Veneris*, all very pretty, and equally useful for edgings in the Fernery. Then there are, besides the light-coloured *A. polyphyllum*, with its gigantic fronds, the deservedly-popular *A. trapeziforme*, *A. peruvianum*, *A. Seemanni*, and others too numerous to be mentioned here. Again, we have some whose shape and general habit are totally different from ordinary Adiantums: such, for instance, as the curious *A. reniforme* (see Fig. 20), with its kidney-shaped fronds borne on slender, shining stalks; or the lesser-known *A. asarifolium*, with broad, entire fronds perfectly round, and measuring sometimes as much as 3½in. across. Very strange, also, is the general appearance of *A. Fëei*, whose climbing fronds expand to very great dimensions, and whose stalks are quite hairy and of a peculiarly ferruginous colour. There are also kinds whose fronds are of a metallic hue, and numerous others, such as *A. macrophyllum* (see Fig. 21), *A. tinctum*, &c., which

FIG. 20. ADIANTUM RENIFORME

Adiantum—*continued.*

are exceedingly interesting because of the beautiful rosy colour of their splendidly-tinted young fronds. Then there are the golden and silvered forms of *A. æthiopicum*, which of late years have become exceedingly rare; as well as the pendulous *A. caudatum* and *A. lunulatum*, so well adapted for basket-culture. With plants so diverse in character, a collection composed exclusively of Adiantums would be most interesting.

Mention has already been made of one or two kinds specially useful for basket-culture; there are, however, several others quite as desirable if their requirements are understood. *A. lucidum* is considered one of the best basket Ferns. The fact of it being deciduous accounts for its disappearance in many cases, as care must be taken during the winter that it does not become thoroughly dry, or it will never start into growth again It does much better if kept moderately moist at the roots all the year round. Although by this system of culture it does not get so much rest as if treated as a deciduous plant, it usually starts much stronger into growth in the spring. *A. Williamsii* is essentially a basket-plant, and it is especially for that purpose that it is most valuable; the more so that it is one among the very few Adiantums which really make a good, effective basket for the greenhouse.

FIG. 21. ADIANTUM MACROPHYLLUM.

A. palmatum, again, by reason of the flexuose character of the rachis, most marked towards the terminal end of the frond, is particularly well adapted for basket culture. Grown in that way it soon makes a very handsome plant, specially attractive through the pale-green colour of its foliage. Though deciduous, losing its fronds about November and starting into fresh growth about March, it should not at any time be allowed to get quite dry at the roots.

Hints as to the treatment that Adiantums generally should receive have been given. There are some few species which are notoriously difficult to grow. These it will be better to refer to specifically. First, as to *A. reniforme*. By most growers this species is considered difficult to manage; but it is generally when kept in too warm a house, or when potted in too loamy a soil, that it gives trouble. To be grown successfully it only requires greenhouse treatment, and it thrives best in a mixture of two parts peat, one part fibrous loam, and one part coarse silver sand (or, when procurable, one part of old lime rubbish, of which its roots are very fond). *A. cristatum* is seldom seen in perfection. It requires less water at

Adiantum—*continued.*

the roots than the majority of Adiantums, is very partial to lime rubbish, and should be grown in a somewhat dry part of the house

FIG. 22. PORTION OF FROND OF ADIANTUM TENERUM FARLEYENSE.

A. tenerum Farleyense (see Fig. 22) is a kind with which the grower's difficulties are more imaginary than real. Heat and moisture are the essential requirements of this plant, and it will not succeed where either of these is deficient, though it may be safely wintered in a house with a temperature of 60deg., occasionally falling to 55deg. In structures where this minimum temperature cannot be maintained in winter, the plants do not die off altogether, but they suffer so severely that several months of careful nursing are required to restore them to their former strength. As regards soil, this Adiantum is not so difficult to please as is supposed. Two parts of good fibrous peat and one of fibry loam and coarse silver sand together form a compost in which it will succeed; but plants in no way inferior have been grown entirely in pure, light fibrous loam, commonly called "yellow loam."

If in some places in England failure has attended the attempt at acclimatising *A. pedatum* outside, it is due to the fact that the underground rhizomes are generally kept too close to the surface of the ground, and that they are not protected in winter by either leaves or snow, and thus feel more keenly the effects of cold, though less severe than that of its own country. Although it is a perfectly hardy Fern, yet, like the other so-called hardy Adiantums, it never grows so luxuriantly out of doors as it does in the greenhouse. Some of the Continental growers yearly produce remarkably handsome plants of this species in large quantities by inserting in early spring, round the edges of their rhododendron beds, small specimens of it, which form good clumps during the summer season. These are lifted from the ground about January, put in 5in. or 6in. pots, and placed in houses or frames in which the temperature is between 40deg. and 60deg. The crowns soon start into growth, and produce a crop of foliage which, on account of its pleasing light green colour and elegant shape, makes the Fern one of the most effective in the conservatory, as it is later on for the rockery or for a shady nook outside.

Although classed among our native Ferns, the British Maidenhair (*A. Capillus-Veneris*) is too tender to bear a very cold temperature: the least frost injures it, and a severe frost kills it. It is a very accommodating plant, and not at all fastidious in its habits, for it grows equally well in a heated frame, in a greenhouse, or in the moist, shady part of a stove. In Europe, it is essentially a coast plant, being found growing exclusively in caves

Adiantum—*continued.*

and fissures of rocks near the sea-level, generally in a shady situation where there is an abundant supply of moisture. When grown in pots, an abundant drainage is essential, and the soil which it prefers is a compost of turfy peat, leaf mould, and lime rubbish, in equal parts; it is also necessary that the rhizomes should be kept on the surface of the soil. And what has been said of the type holds good with the interesting and handsome varieties which have been produced.

Just as there are some rather difficult species to manage in the genus *Adiantum*, so are there some whose culture is of the easiest. Such is *A. cuneatum*, which requires less attention than almost any other Fern, and thrives in almost any soil, although it prefers a rich, light compost. It is not very particular as to temperature, and, provided regular moisture at the roots be kept up, it will produce all through the year an immense quantity of its useful fronds from a tufted crown. It is so readily propagated from spores that wherever it is grown a stock of young plants spring up. Also of easy cultivation is *A. Henslovianum*, but, being entirely deciduous, it requires a period of rest from November to February, when it is almost, if not entirely, leafless.

To the species and varieties described on pp. 24-9, Vol. I., the following should be added:

A. asarifolium (Asarum-leaved). A variety of *A. reniforme.*

A. assimile cristatum (crested). *fronds* elegantly crested. 1887. Garden variety.

FIG. 23. ADIANTUM BIRKENHEADII.

A. Birkenheadii (Birkenhead's). *fronds* tripinnate, about 2½ft. long and 1ft. broad, deltoid, acuminate; pinnæ alternate, distant and long-stalked towards the base, closer together and sessile near the apex, the lower ones bipinnate, the upper ones pinnate; pinnules obtusely oblong-trapezoid, cut on the upper edge into shallow lobes. 1886. A fine garden Fern, of tufted habit. Intermediate house. See Fig. 23.

A. Bournei (Bourne's). A variety of *A. cuneatum.*

A. brasiliense (Brazilian). A form of *A. curvatum.*

A. bulbiferum (bulb-bearing). A variety of *A. Capillus-Veneris*

Adiantum—*continued.*

A. Burnii (J. B. Burn's). *sti.* smooth, ebeneous. *fronds* evergreen, glabrous, broadly ovate, acuminate, tri- or quadripinnate; pinnæ ovate, the lower ones with a long stalk, the upper ones almost sessile; pinnules stipitate below, the basal one 2in. to 2½in. long, narrowly ovate, the basal pinnulets compound, the upper ones still narrower because less divided at the base. *sori* numerous, roundish-reniform, seated at the base of a notch at the apex of the lobes. 1887. Garden hybrid. Stove.

A. Capillus-Veneris bulbiferum (bulb-bearing). A variety having little bulbils on the pinnæ—probably the only Adiantum possessing that character.

A. C.-V. cuneæformis (wedge-shaped). *fronds* very long, rather narrow, and loose. 1896. A very graceful, garden form.

A. C.-V. depauperatum (poor). *fronds* erect, narrow, about 1ft. long; pinnules much cut, in some cases reduced to thread-like segments. An interesting sport or natural hybrid.

A. C.-V. digitatum (digitate). *fronds* not symmetrical, but with a tendency to become unequally ovate, dwarfish, smooth, evergreen; pinnæ and pinnules unequal and irregular, the more perfect pinnules rhomboid, with a rounded apex, deeply furcate-lobed, the edges marginate. *sori* wanting. A curious variety.

A. C.-V. grande (large). A very handsome variety, larger, denser, and more bushy in habit than the type. 1886. Hardy.

A. C.-V. Hookeri (Hooker's). *fronds* erect; pinnæ and their ultimate sub-divisions disposed alternately, the latter cuneate at base and very finely toothed at the summit, which is rounded or fan-shaped. Crimea.

A. C.-V. imbricatum (imbricated). *sti.* and rachises glossy ebeneous. *fronds* ovate, 6in. long, densely imbricated, bi- or tripinnate, evergreen; pinnæ crowded, 2in. to 2½in. long, 1½in. wide; pinnules large, much overlapping, the lateral ones rhomboid, ⅔in. long and ½in. broad, the terminal ones broadly flabellate, 1in. or more in width. *sori* elongate-oblong. 1887.

A. C.-V. Kalon (Kalon). *fronds* ovate, 11in. long, 5in. broad, arching; pinnules very leafy and closely set. One of the few forms artificially raised from spores in this country.

A. C.-V. obliquum (oblique). *fronds*, pinnæ very large, oblique. 1885. (I. H. 1885, 546.)

A. C.-V. ramulosum (full of small branches). *fronds* having the main stem twice or thrice divided towards the summit, forming a spreading tuft of short, pinnate branches; pinnules in the lower portion narrow and depauperated. An extraordinary variety.

A. Catherinæ (St. Catherine's). A synonym of *A. trapeziforme Sanctæ-Catherinæ.*

A. chilense (Chilian). A form of *A. æthiopicum.*

A. Clæsianum (Claes'). *fronds* composed of rhomboid pinnules, which are pale green, with a silver blotch at the base and silver

FIG. 24. ADIANTUM CONCINNUM.

Adiantum—*continued.*

lines radiating to the bluntly-toothed margins. South America, 1894. A charming, stove Maidenhair. (I. H. 1894, p. 137, t. 9.)

A. Collisii (Collis'). *sti.* black, slender, 1ft. to 1½ft. long. *fronds* triangular, 1½ft. to 2ft. across; pinnules small, rhomboid, truncate on the inner and lower sides, and slightly toothed on the outer and upper margins. 1885. A beautiful, decorative, stove Maidenhair, of garden origin.

A. colpodes roseum (rosy). In this variety the young fronds are of a rich coppery-red tint. 1888.

A. concinnum. An illustration of this charming tropical American species is given in Fig. 24.

A. cornubiense (Cornish). A form of *A. Capillus-Veneris.*

A. cultratum (knife-like). A variety of *A. trapeziforme.*

A. cuneatum Bournei (Bourne's). *sti.* long. *fronds* dense, triangular. 1882. A garden variety in the way of *A. c. Pacotti*, but less refined in growth.

A. c. deflexum (deflexed). *fronds* triangular, three or four times pinnate; pinnules deflexed, lobed; lobes crenate-toothed. 1884. A garden hybrid between *A. Bausei* and *A. cuneatum.* Stove.

A. c. elegans (elegant). *sti.* glossy, 6in. long. *fronds* triangular, about 9in. long and broad; pinnæ ovate-triangular, with rather distantly-set, cuneate pinnules, which are ¼in. long and ⅛in. broad. Gardens, 1885. Stove.

A. c. fasciculatum (fascicled). A variety with crested fronds. 1897.

FIG. 25. ADIANTUM CUNEATUM GRANDICEPS.

A. c. grandiceps (large-headed). A crested variety, of drooping habit, well adapted for basket culture. See Fig. 25.

A. c. Lambertianum (Lambert's). A variety having the very small ultimate segments much crumpled and curled. 1890.

A. c. Pacotti (Pacott's). *fronds*, pinnules overlapping each other to an uncommon extent. Habit very dense.

A. c. strictum (upright). *fronds* erect, four times pinnate; pinnæ ascending, arranged somewhat spirally. 1884. Stove.

A. c. versaillense (Versailles). *sti.* branched for about two-thirds of their length. *fronds* erect, seldom exceeding 10in. in height, crested as in *grandiceps*, but much denser and more regular; pinnules of a pleasing light green. 1889. A valuable pot-plant, also useful for cutting and for decoration.

A. curvatum brasiliense (Brazilian). *rhiz.* stout, very slowly creeping. *sti.* hairy and brown. *fronds* often 3ft. in height, pubescent; pinnæ dark green, smooth, shorter, broader, blunter, and not so closely set as in the type. A very distinct variety.

A. cyclosorum (having circular sori). *sti.* stoutish, glossy black, 8in. to 10in. long. *fronds* 1½ft. to 2ft. long, triangular, tripinnate, glabrous; pinnæ spreading, ovate, stalked; pinnules five to nine lines long, rhomboid. *sori* eight to ten to a pinnule, circular,

Adiantum—*continued.*

marginal. Ecuador, 1887. A handsome and well-marked, deciduous, stove species.

A. Daddsii (J. Dadds'). *sti.* glossy ebeneous, about 8in. long. *fronds* above 1ft. long, fertile throughout, deltoid, decompound, evergreen, glabrous; pinnæ triangular-ovate, stipitate, furnished with numerous but not crowded pinnules; ultimate segments very numerous, quite small, distinct, everywhere pedicellate, the terminal ones cuneate with two or three lobes at the apex, the intermediate ones rhomboid-cuneate, more or less deeply lobed on the anterior side, the basal ones roundish or obovate, narrowed into the pedicels. *sori* roundish-reniform, situated in a notch at the apex of the marginal lobes. 1887. A supposed hybrid. Greenhouse.

A. daphnites (glistening). A variety of *A. Capillus-Veneris.*

A. deflexum (deflexed). A variety of *A. cuneatum.*

A. elegans (elegant). A variety of *A. cuneatum.*

FIG. 26. ADIANTUM FERGUSONI.

A. elegantissimum (most elegant). A sport from *A. cuneatum.*

A. excisum nanum (dwarf). *fronds* not more than 8in. high, rigid, produced in great abundance from a densely-tufted crown, tripinnate; pinnules cuneate, closely set. A garden variety, useful for edgings or for pot-culture.

A. fasciculatum (fascicled). A variety of *A. cuneatum.*

A. Fergusoni (Ferguson's).* *sti.* long, glossy purplish-black. *fronds* triangular-ovate, tripinnate, stiffly erect; pinnæ long-stalked, spreading; pinnules variable, mostly large, bluntly ovate, truncate at base, with a pair of large basal lobes, and three or four smaller lobes above, the pedicels continuous with the rachis, not articulated, all the lobes again lobulate, and, where sterile, finely toothed. *sori* oblong, at the tops of the ultimate lobes. Ceylon, 1884. Stove. See Fig. 26. (G. C. ser. iii., vol. ii., p. 469.)

A. festum (pleasant). *sti.* 8in. to 9in. long, purplish-ebeneous. *fronds* 1ft. long, glabrous, evergreen, decompound, drooping, triangular, acuminate; pinnæ deltoid, spreading; pinnules of ultimate segments small, crowded, cuneate or rhomboid-cuneate, larger towards their extremities, the terminal ones symmetrically or unequally cuneate, bipartite, with deeply-lobed divisions, the rest lobed on their anterior edge. *sori* roundish-reniform, placed in a sinus of the lobe. 1887. Greenhouse hybrid.

A. Footi (Foot's). A variety of *A. Capillus-Veneris.*

A. fragrantissimum (very fragrant). *sti.* 5in. to 6in. long, glossy ebeneous. *fronds* 1ft. to 1¼ft. long, deltoid, quadripinnate, glabrous, evergreen; pinnæ ovate, spreading, the basal ones long-stalked; ultimate pinnules or pinnulets large, on long, slender pedicels, cuneate, the terminal ones equally lobed at the apex, the lateral ones more or less obliquely cuneate, lobed. *sori* roundish-reniform, placed in a sinus at the apex of the lobes. 1887. Probably a hybrid. Stove. Reason for specific name not stated. (G. C. ser. iii., vol. ii., p. 199.)

A. Funckii (Funck's). A sub-variety of *A. trapeziforme.*

A. gracillimum nebulosum (cloud-like). A very pretty garden form, having fronds still finer and more delicate than in the type. 1893.

A. grandiceps (large-headed). A variety of *A. cuneatum.*

A. Hemsleyanum (Hemsley's). A distinct seedling, of elegant habit, having tall fronds, which are graceful, light in texture, pale green, with elongated-cuneate pinnæ not too closely set. Very useful as a pot plant. 1894.

A. Hendersoni (Henderson's). A variety of *A. tetraphyllum.*

A. hians (gaping). *sti.* black. *fronds* about 10in. long, triangular-ovate, tripinnate; pinnæ ovate, the upper ones stalked, the lower ones almost sessile; pinnules variable, roundish, balloon-shaped, transversely oblong, or rhomboidal, the end rounded, bearing one or two large, broadly-gaping sori. South Pacific Islands, 1887. An ornamental, stove Maidenhair.

A. Kaulfussii (Kaulfuss's). *sti.* wiry, upright, polished, blackish, 6in. to 9in. long. *fronds* 6in. to 12in. long, 3in. to 4in. broad, consisting of a large terminal lobe and eight or ten pinnæ on each side; lowest pinnæ 2in. to 3in. long, cordate and auricled at base, shortly stalked, those of the barren fronds slightly toothed. *sori* in interrupted marginal lines. West Indies, &c. Stove.

A. Lambertianum (Lambert's). A form of *A. cuneatum.*

A. lineatum (lined). A variegated form closely resembling *A. Cæsianum*, the fronds being marked with narrow pale lines. Brazil, 1895. (I. H. 1895, p. 312, t. 44.)

A. macrophyllum albo-striatum (white-striped). *fronds* pale green, with numerous white stripes and spots. 1894. A dwarf variety.

A. m. bipinnatum (bipinnate). This handsome variety differs from the type in having the fronds twice-pinnate in the lower part, and with smaller pinnules. Jamaica, 1885.

A. Mairisii (Mairis'). *fronds* triangular, quadripinnate; pinnæ ovate, on rather long stalks; pinnules cuneate-trapezoid, with an irregular, truncate apex, those near the ends of the pinnæ larger, with a lobate margin, the fertile ones cut into oblong, concave sinuses, giving a bluntly cornute aspect to the principal pinnule. 1885. Stove. Garden variety; perhaps a hybrid between *A. Capillus-Veneris* and *A. cuneatum.*

A. manicatum (having sleeves). This is described as a "seedling with bold, broad fronds and much-divided pinnules." 1890.

A. Matthewsianum (Matthews'). A synonym of *A. polyphyllum.*

FIG. 27. ADIANTUM MONOCHLAMYS.

A. monochlamys.* The habit of this beautiful Japanese species, which is allied to, but distinct from, *A. venustum*, is shown in Fig. 27.

A. Moorei plumosum (feathery). A charming plumose form for either pans or pots. 1894.

A. nebulosum (cloud-like). A form of *A. gracillimum.*

A. novæ-caledoniæ (New Caledonian).* *cau.* tufted. *sti.* and rachis blackish-purple, the latter clothed with dark brown hair-scales. *fronds* pedately pentagonal in outline, tripinnate at the basal part, bipinnate above; pinnæ narrow-lanceolate, the larger ones caudate; pinnules irregular in size and form, coarsely toothed, the largest 1in. to 1½in. long. New Caledonia. 1883. Stove. See Fig. 28, for which we are indebted to Messrs. W. and J. Birkenhead.

A. obliquum minus (lesser). *sti.* black. *fronds* pinnate; pinnæ falcate, acuminate, the sterile ones incised-toothed, the fertile ones with close-set, oblong sori, the apex trapeziform and lobed. 1883.

A. Oweni (Owen's). *sti.* about 8in. long, glossy ebeneous. *fronds* about 1¼ft. long, triangular-ovate, evergreen, glabrous, erect, quadripinnate; pinnæ ascending, triangular, stipitate, the lower ones on stalks about 1in. long, the upper ones gradually shorter;

Adiantum—*continued.*

basal pinnules ovate; pinnulets very small, shortly stipitate, slightly lobed, the terminal ones cuneate, the others mostly rhomboid. *sori* two to four to a pinnule, placed in a sinus of the marginal lobes. 1837. Stove hybrid.

A. Pacotti is a variety of *A. cuneatum.*

A. Paradiseæ (Miss Paradise's). *sti.* and rachis slender, naked, brownish-black. *fronds* deltoid, tripinnate, glabrous, 6in. long and nearly as broad; lower pinnæ deltoid, unequal, cut away on the lower side at base, conspicuously petiolate; ultimate segments rhomboid, ¼in. to ½in. long. *sori* one to three to a segment, broadly reniform, one to two lines long. Cape Colony, 1889. Greenhouse.

A. pentadactylon (five-fingered). A variety of *A. trapeziforme.*

Adiantum—*continued.*

A. roseum (rosy). *fronds*, when young, rosy-tinted. A dwarf, garden variety. Greenhouse.

A. Sanctæ-Catherinæ (St. Catherine's) A variety of *A. trapeziforme.*

A. scabrum (scurfy). A variety of *A. æthiopicum.*

A. schizophyllum (cut-fronded). *sti.* and rachises remote in varying degrees. *fronds* numerous, with stoutish, conspicuous, ebeneous rachises; pinnules small, commonly minute, most of them deeply cut into narrow lobes. *sori* small, lunate, sparingly produced in a perfect state. 1837. Stove or greenhouse. Although stated to be a seedling from *A. æmulum*, this is doubtless a form of *A. cuneatum.*

A. Schneideri (Schneider's). A handsome Fern, of graceful

FIG. 23. ADIANTUM NOVÆ-CALEDONIÆ.

A. plumosum (feathery). *fronds* about 8in. long, pale green. 1894. A pretty Maidenhair, of compact habit, resembling *A. fragrantissimum* and *A. cuneatum Pacotti.*

A. Reginæ (Queen's). *sti.* slender, black, shining. *fronds* shorter, broader, and more leathery than in *A. Ghiesbreghtii* (one of the supposed parents of this hybrid). *sori* sparingly produced, oblong, in an interrupted row round the outer margin. 1837. Stove.

A. rhodophyllum (rose-fronded).* *fronds* evergreen, triangular, tripinnate, elegantly spreading, about 1ft. long; pinnæ few, pinnate or bipinnate, the upper undivided ones 1½in. long, and, as well as the 1in. pinnules, rhomboid-trapezoid, and set on hair-like, black stalks; young fronds rosy-purple. *sori* at the apices of the lobes, but much broken up. 1884. A beautiful, stove hybrid.

habit, raised from spores of *A. Waltoni diffusum.* The pinnæ are long and deeply cut, after the manner of *A. cuneatum dissectum*, and the habit of the plant is dwarf and robust. 1894.

A. tenellum (tender). A pretty and delicate form, much resembling *A. gracillimum*, but with better-shaped fronds. 1894.

A. tenerum Bessonianum (Besson's). *fronds* having crowded, imbricating, kidney-shaped pinnæ. West Indies, 1896.

A. tetragonum (quadrangular). *sti.* slightly hairy, 1ft. or more in length. *fronds* pedato-tripinnate, 1ft. long, 1½ft. broad; terminal pinna spear-shaped, 6in. to 9in. long, 5in. to 6in. broad; pinnules deep green, spear-shaped, 2½in. to 3in. long, slightly lobed, rounded on their upper side, cuneate-truncate on their lower side at base. *sori* short, very narrow, disposed at the tips of the lobes down both sides. Brazil. Stove.

Adiantum—*continued.*

A. tetraphyllum acuminatum (taper-pointed). *fronds* pale green, tapering at the tip; pinnæ long, narrow-pointed. A particularly elegant variety.

A. t. gracile (slender). A handsome variety, of moderate stature, remarkable for the beautiful reddish tint assumed by the fronds when first developed.

A. t. obtusum (obtuse). *sti.* brown. *fronds* graceful, bipinnate, 8in. to 10in. long; pinnæ four to six; pinnules more rounded than in the type. 1889. (I. H. 1889, t. 86.)

A. trapeziforme. An illustration of this handsome West Indian species is given in Fig. 29.

FIG. 29. ADIANTUM TRAPEZIFORME.

A. Veitchii (Veitch's). A synonym of *A. monochlamys.*

A. versaillense (Versailles). A variety of *A. cuneatum.*

A. Victoriæ (Victoria's). *fronds* crowded, bipinnate, forming close, low tufts 4in. to 6in. high, rich green; pinnules rather large, bluntly conical or sub-rhomboidal. 1882. A handsome, dwarf, stove Maidenhair, "supposed to be a hybrid between *A. Ghiesbreghti* and *A. decorum* [*Wagneri*], but it appears more like a dwarf form of *A. tenerum Farleyense*" (Moore).

A. Wagneri (Wagner's). The correct name of *A. decorum.*

A. Waltoni (H. and E. H. Walton's). *sti.* 9in. long, glossy ebeneous. *fronds* nearly 1½ft. long, broadly ovate, erect, glabrous, evergreen, quadripinnate; pinnæ ascending, ovate, the lower ones long-stalked, the upper ones with the pinnules next the rachis elongated and compound; pinnulets pedicellate, more or less cuneiform, often somewhat oblique. *sori* abundant, four to six to a pinnule, placed in a sinus of the marginal lobes. 1887. Greenhouse hybrid.

A. W. diffusum (diffuse). An elegant and distinct form of *A. cuneatum*, having fronds much larger and better adapted for mixing with cut flowers. 1888.

A. Weigandii (Weigand's). *fronds* triangular, tripinnate, glabrous, about 1ft. long, forming a neat, tufted mass; pinnæ and pinnules long-stalked, the latter ovate from a broad base, lobed, with narrow sinuses. *sori* large, numerous, nearly circular, one or two on each lobe. America (garden origin), 1884. Greenhouse.

ADINA. This genus comprises about half-a-dozen species of stove trees or shrubs, natives of tropical and sub-tropical Asia and America. Flowers small or minute, in solitary or paniculate, globose heads. Leaves opposite, petiolate, ovate, lanceolate, or cordate.

A. globifera is the correct name of *Nauclea Adina.*

ADLUMIA. This genus belongs to the TRIBE *Fumarieæ* of ORD. *Papaveraceæ.*

ADONIS. Of this genus there are, according to Bentham and Hooker, about four species, broadly dispersed over the North temperate regions of the Old World (*A. autumnalis* is a native of Britain). To those described on p. 29, Vol. I., the following should be added:

A. amurensis (Amur River).* *fl.* golden-yellow, white, rose-coloured, or bright red, striped, 2in. across; petals twenty to fifty, rather longer than the sepals. February. *l.*, cauline ones (which are really two or three connate leaves) 3in. to 6in. long and broad, trisected to the base; segments crowded, pinnatisect to the base. Stem 8in. to 18in. high. Manchuria and Japan, 1895. Cool-house perennial. (B. M. 7490.)

ÆCHMANDRA. A synonym of **Kedrostis** (which *see*).

ÆCHMEA. Under this genus the following are included by J. G. Baker: *Androlepis, Canistrum* (kept distinct in Vol. I.), *Chevaliera* (also spelt *Chevalliera*), *Hohenbergia, Hoplophytum, Lamprococcus, Macrochordium, Pironneava,* and *Pothuava.* It now embraces about 130 species, natives of tropical America. The flowers are smaller than in *Billbergia,* and are very variable in colour. To the species described on p. 30, Vol. I., the following should be added:

Æ. amazonica (Amazon). A synonym of *Karatas amazonica.*

Æ. augusta (pleasing). *fl.* rosy-lilac, small, glomerulate; inflorescence paniculate. *l.* spreading, broad, ligulate, obtuse, denticulate, bright green, irregularly spotted with dull green. South Brazil, 1833. A large and robust species. SYNS. *Æ. ferruginea, Hohenbergia ferruginea* (R. H. 1831, p 437, f. 104).

Æ. aurantiaca (orange). The correct name of *Canistrum aurantiacum.*

Æ. aureo-rosea (golden-pink). *fl.*, petals reddish-yellow, in a rather loose, erect spike 3in. to 4in. long; peduncle 1ft. long, upper bract-leaves bright crimson. *l.* few, 1½ft. long, 1in. to 1¼in. broad. Brazil, 1863. Probably a variety of *Æ. nudicaulis.*

Æ. Barleei (Barlee's). *fl.* distichous; calyx with a globose, mealy tube; corolla pale yellow; lower bracts red, upper ones green; stem central, paniculately branched. *l.* eight or nine in a rosette, lorate-ensiform, green, 2ft. to 3ft. long, 2in. broad, thinly white-lepidote, prickly on the margins. British Honduras, 1883.

Æ. bracteata (bracteate). The correct name of the plant described on p. 213, Vol. I., as *Bromelia bracteata.*

Æ. brasiliensis (Brazilian). *fl.*, calyx, bracts, and rachis scarlet; petals blue, erect, emarginate-rounded at base; panicle contracted, oblong, 5in. long, highly glabrous, the branchlets sessile, short, two- to six-flowered. *l.* recurved-spreading, ligulate-linear, much dilated at base, rigid, channelled, the margins spiny-toothed, acuminate, 1½ft. to 3ft. long. Rio Janeiro, 1885. (R. G. 1202.)

Æ. bromeliæflora (Bromelia-flowered). *fl.* embedded in white, cottony tomentum; petals lemon-yellow, turning brownish-black; spike dense, 2in. to 6in. long; peduncle 1ft. to 2ft. long; bract-leaves bright red or pale greenish-white. *l.* twelve to twenty, rosulate, 2ft. to 3ft. long, 1½in. to 2in. broad, lorate from a large, ovate base. Trinidad, &c.

Æ. calyculata. SYNS. *Hohenbergia calyculata* (Ref. B. 236), *Hoplophytum calyculatum* (B. H. 1865, p. 162, t. 11), *Macrochordium luteum* (R. G. 1867, p. 164, t. 544).

Æ. Chantini (Chantin's). *fl.*, calyx and ovary reddish-yellow, ¾in. long; inflorescence a dense, ovoid, bipinnate panicle, 4in. to 6in. long; peduncle 1ft. long; upper bract-leaves bright red. *l.* ten to twelve in a utricular rosette, lorate, 1ft. long, 1½in. to 2in. broad, transversely zoned with green and white, cuspidate, minutely toothed. Amazon Valley, 1877. SYN. *Billbergia Chantini* (R. H. 1878, p. 112, f. 22; 1880, p. 272, f. 54-56).

Æ. cœlestis (F. d. S. 2146). SYNS. *Hohenbergia cœlestis* (Ref. B. 234), *Hoplophytum cœleste* (B. H. 1862, p. 97).

Æ. conspicuiarmata (conspicuously armed). *fl.* yellowish, fading to black, sessile, in a small, globose head; peduncle white-woolly, shorter than the leaves, with long, narrow bracts. *l.* long, recurved, and bent, spiny-toothed, dark, shining green above, densely white-punctate-striate beneath. Brazil, 1886. A fine Bromeliad. SYN. *Macrochordium macranthum* (R. G. 1886, p. 297, f. 34).

Æ. Cornui (Professor Cornu's). A form of *Æ. nudicaulis.*

Æ. crocophylla (Saffron-leaved). *fl.* green, small, in a dense, globose head 2½in. in diameter; peduncle erect, 6in. to 8in. long. *l.* about twenty in a rosette, lorate, 1½ft. to 2ft. long, 3in. broad, cuspidate, minutely serrated, the outer ones rose-coloured during the flowering period. Brazil, 1885. SYNS. *Ananas crocophylla, Chevaliera crocophylla.*

Æ. discolor (B. M. 4293; G. M. B. 1850, t. 121). This is a variety of *Æ. fulgens.*

Æ. Drakeana (Drake's).* *fl.*, calyx bright rose; corolla bright blue, 1½in. long; spike oblong, loose, 6in. long; peduncle 1½ft. long, violaceous at base, red above, white-tomentose. *l.* about twelve in a rosette, 1½ft. to 2ft. long, 2in. broad, channelled, mucronate, with distant spines. Ecuador, 1888. A fine species.

Æ. exsudans (sweating). SYN. *Bromelia exsudans* (B. H. 1879, p. 352, t. 18).

Æ. fasciata. SYNS. *Billbergia fasciata* (B. R. 1130), *B. rhodocyanea,* of Lemaire (B. M. 4383; F. d. S. 207).

Æ. Fernandæ (Fernanda's). The correct name of *Bromelia Fernandæ.* SYN. *Ananas Mensdorfianus.*

Æ. ferruginea (rusty). A synonym of *Æ. augusta.*

Æ. flexuosa (flexuous). A synonym of *Æ. spectabilis.*

Æ. Fuerstenbergii. The correct name of this plant is now *Streptocalyx Fuerstenbergii.*

Æchmea—*continued.*

Æ. Germinyana (Germiny's).* *fl.*, petals reddish-white, nearly twice as long as the sepals; spike dense, 6in. to 8in. long; peduncle half as long as the leaves; bracts bright red, the lower ones 1in. long. *l.* twenty to thirty, rosulate, lorate from an ovate base, 2ft. to 2½ft. long, 3in. broad, bending over from the middle. Colombia. SYNS. *Bromelia daguensis* (of gardens), *Chevaliera Germinyana* (R. H. 1881, p. 230).

Æ. gigantea (gigantic). *fl.*, petals reddish-blue, half as long again as the sepals; inflorescence a dense spike, 1½ft. to 2ft. long, 4in. to 5in. in diameter, at first globose, finally oblong; peduncle stout, erect, 2ft long; bract-leaves bright red, spreading. *l.* densely rosulate, ensiform, 6ft. to 8ft. long, 6in. to 8in. broad at base, firm, gradually tapering, with stout, black spines. South Brazil, 1888. SYN. *Chevaliera gigantea.*

Æ. Glaziovii (Glaziou's).* *fl.*, petals reddish-purple, half as long again as the sepals; inflorescence a dense, oblong panicle 4in. to 6in. long; peduncle 1ft. or more in length; bract-leaves imbricated. *l.* twenty in a rosette, lorate, generally 1½ft. long (but one plant at Kew had, according to J. G. Baker, leaves 7ft. to 8ft. long), horny, deltoid-cuspidate at apex. South Brazil, 1880. (B. H. 1881, p. 271, t. 13.)

Æ. glomerata (B. M. 5668). SYNS. *Hohenbergia erythrostachys* (R. H. 1869, p. 217, f. 53), *Pironneava Morreniana* (R. G. 805.)

Æ. Lalindei (Lalinde's).* *fl.*, calyx green, ellipsoid, pink at the tips; corolla not exserted; spike dense; bracts crimson, large, acute, reflexed; stem tall. *l.* 3ft. to 4ft. long, broad, concave, acute, denticulate, green. Colombia, 1883. A handsome plant. (I. H. n. s. 481.)

Æ. Legrelliana is a synonym of *Ortgiesia Legrellcana.*

Æ. Lindeni (B. M. 6565). SYN. *Hoplophytum Lindeni* (B. H. 1873, p. 81, t. 5).

Æ. lineata (lined). *l.* oblong-ligulate, concave, abruptly acuminate, finely and remotely toothed, green, with alternating broad stripes of white, disposed in cylindrical tufts, spreading at the apex; marginal spines black. Brazil, 1893. SYN. *Hoplophytum lineatum.*

Æ. macracantha (large-spined). A synonym of *Æ. Schiedeana.*

Æ. Mertensii (Mertens'). *fl.*, petals rose-pink, twice as long as the sepals; inflorescence a dense, cylindrical panicle 6in. to 9in. long; flower-bracts green, ½in. long; peduncle 1ft. to 1½ft. long; upper bract-leaves large, bright red. March. *l.* twelve to twenty in a utricular rosette, lanceolate, ovate at base, 2ft. long, 1½in. to 2in. broad, with small teeth. Dutch and British Guiana, 1830. (B. M. 3186.) SYN. *Hohenbergia Mertensii* (Ref. B. 284).

Æ. mexicana (Mexican). *fl.* on erecto-patent pedicels ½in. long; calyx green, ½in. long; petals bright crimson, connivent, protruding ½in. from the calyx; panicle oblong-cylindrical, 1ft. long, 4in. to 5in. broad, the lower branches 2in. to 3in. long; peduncle stout, 1ft. long; bracts colourless, erect. Winter. *l.* twenty to thirty in a dense rosette, lorate, with a deltoid-cuspidate tip, above 2ft. long, 3in. broad, the dilated base 4in. to 5in. broad, pale green, with darker green spots; prickles small, the lower ones tipped with brown. Mountains of Orizaba, 1886.

Æ. mucroniflora (having pointed flowers). *fl.*, petals bright yellow, cuspidate, ½in. long; inflorescence a dense, oblong spike 3in. to 4in. long; flower-bracts having a large cusp; peduncle less than 1ft. long, the upper leaves bright red. *l.* about a dozen in a rosette, lorate, 1ft. to 1½ft. long, 1½in. broad, firm, channelled, ovate at base, rounded to a cuspidate apex, with horny teeth. Demerara, 1855. (B. M. 4832.)

Æ. myriophylla (many-leaved). *fl.* distichous; calyx bright red; corolla pink, fading to lilac; scape 1½ft. high, panicled above, and, as well as the bracts, bright red. *l.* forming a dense rosette, narrow, channelled, attenuated, 2ft. to 2½ft. long, 1in. broad, dull green, sprinkled with silvery scales on the back, the margins armed with close, brown prickles. Tropical America, 1887. (B. M. 6939.)

Æ. nudicaulis (naked-stemmed). *fl.*, petals pale lemon-yellow; inflorescence a loose, drooping spike 3in. to 6in. long; peduncle 1½ft. to 2ft. long; bract-leaves bright red. *l.* about a dozen in a utricular rosette, lorate from an oblong base, 2ft. to 3ft. long, 2in. to 3in. broad, horny, with small prickles. Tropical America, 1825. SYNS. *Bromelia nudicaulis* (H. E. F. 143), *Pothuava nudicaulis* (R. G. 1096).

Æ. n. Cornui (Professor Cornu's). A form of the above, with a short, dense, oblong spike. Brazil, 1885. (R. H. 1885, p. 36, under name of *Æ. Cornui.*)

Æ. n. distans (distant). A variety having a loose flower-spike and short, broad leaves.

Æ. odora (odorous). *fl.* sessile, spreading; petals pale yellow; panicle loose, bipinnate, 1ft. to 1½ft. long; peduncle 1½ft. long; bract-leaves appressed. *l.* ten to twelve, 2ft. to 3ft. long, lorate, lepidote on both sides, but especially at the back. West Indies, 1879. A distinct but not very showy species.

Æ. Ortgiesii. This is now correctly known as *Ortgiesia tillandsioides.*

Æ. Pineliana (Pinel's). *fl.* in a dense, simple spike 2in. to 3in. long; sepals having a large cusp; petals bright yellow, ½in. long; peduncle 1ft. to 1½ft. long; bract-leaves bright red. *l.* twelve to fifteen in a utricular rosette, lorate, 1ft. to 1½ft. long, 1½in. broad, ovate at base, deltoid at apex, with brown-pointed spines. South Brazil, 1851. SYN. *Echinostachys Pineliana* (B. M. 5321).

Æ. purpurea (purple). *fl.* about 1in. long; bracts a dozen or more, bright red, 2in. to 3in. long; peduncle about 1ft. long; bract-leaves large, tinged with red. *l.* twelve to twenty in a utricular rosette, lanceolate, dilated at base, 2ft. long, 1½in. to 2in. broad, narrowed to the apex. South Brazil, 1831.

Æ. regularis (regular). *fl.* white; petals twice as long as the sepals; inflorescence a dense, oblong, bipinnate panicle 6in. to 8in. long, the lower branches subtended by large, red, lanceolate bracts; peduncle above 1ft. long; upper bract-leaves bright red. September. *l.* 1½ft. to 2ft. long, 1½in. to 2in. broad, lorate, horny, cuspidate, with a dilated, utricular base, and horny prickles ¼in. long. South Brazil, 1870.

Æ. rosea (rosy), of Baker. The correct name of *Canistrum roseum.* *fl.* white and green; inflorescence a dense head, 2in. to 3in. in diameter; peduncle erect; bract-leaves pink. *l.* about twenty in an open rosette, 1½ft. to 2ft. long, 1½in. to 2in. broad, mottled with darker green. South Brazil. (B. H. 1833, p. 195, tt. 14, 15, under name of *Canistrum roseum.*)

Æ. rosea (rosy), of gardens. A synonym of *Æ. suaveolens.*

Æ. Schiedeana (Schiede's). *fl.*, petals pale yellow, shortly protruded; inflorescence a tripinnate panicle 1½ft. long; lower branches subtended by large, red bracts; peduncle 2ft. long; upper bract-leaves bright red. *l.* about twenty in a rosette, lorate from an ovate base, 2ft. to 3ft. long, 2in. to 3in. broad, deltoid-cuspidate at tip, with large marginal teeth. Central Mexico, 1880. SYN. *Æ. macracantha.*

Æ. setigera (bristle-bearing). A garden synonym of *Billbergia pyramidalis Croyiana.*

Æ. Skinneri (Skinner's). *fl.* without bracts; petals yellow, shortly protruded; inflorescence an almost cylindrical panicle 1ft. long; peduncle erect, 1½ft. long; bract-leaves pale. March. *l.* about twenty in a utricular rosette, lanceolate, 2ft. to 2½ft. long, 2½in. to 3in. broad, ovate at base, with minute teeth. Guatemala, 1850. SYNS. *Androlepis Skinneri* (under which name it is briefly described in Vol. I.), *Billbergia Skinneri* (of gardens).

Æ. speciosa (showy). *l.* tufted, spreading, leathery, oblong, acute, mucronate, finely toothed, concave above, more or less densely covered with silvery scales, especially on the under-surface; upper surface bright shining green, with broad, longitudinal stripes of clear yellow. Brazil, 1893. A highly ornamental species, of moderate size. SYN. *Lamprococcus speciosus.*

Æ. spectabilis (showy).* *fl.* distant, sessile, erecto-patent; calyx pale pink, ½in. to ⅝in. long; petals bright red, lingulate, shortly protruded; panicle ovate, bipinnate, 1½ft. to 2ft. long, 6in. to 8in. in diameter, the lower branches 3in. to 4in. long; peduncle erect, stout, 1½ft. long; bracts pale, erect. Winter. *l.* twenty to thirty in a dense rosette 3ft. to 4ft. in circumference, lanceolate from a dilated base, bright green, horny, 3in. broad, channelled, with scattered, whitish spots. Guatemala, 1886. Plant stemless. SYN. *Æ. flexuosa* (R. H. 1876, p. 311).

Æ. suaveolens (sweetly-scented). *fl.*, sepals mucronate; petals reddish-purple, ½in. long; inflorescence an oblong, bipinnate panicle 6in. to 8in. long; bracts mucronate; peduncle slender, 1½ft. long; bract-leaves inconspicuous. April. *l.* few, in a long, utricular rosette, the outer ones linear, the inner ones lanceolate, 1½ft. to 2ft. long, 1in. to 1½in. broad, horny, with ascending prickles. Brazil, 1831. SYNS. *Æ. rosea* (of gardens), *Billbergia purpureo-rosea* (B. M. 3304).

Æ. tillandsioides (Tillandsia-like). *fl.*, petals twice as long as the sepals; panicle 4in. to 5in. long, consisting of four to eight sessile spikes; peduncle 1ft. long; upper bracts bright red, serrated. *l.* about a dozen in a utricular rosette, lanceolate, 1ft. to 1½ft. long, 1½in. broad, gradually narrowed, horny. Amazon Valley, &c., 1881. This must not be confounded with *Ortgiesia tillandsioides.*

Æ. Veitchii (B. M. 6329). SYN. *Chevaliera Veitchii* (B. H. 1878, p. 177, t. 5; R. H. 1880, p. 450).

Æ. viridis (green). The correct name of *Canistrum viride* (B. H. 1874, p. 376, t. 16).

Æ. Weilbachii (Weilbach's).* *fl.*, sepals bright lilac; petals lilac at first, but turning brownish-black; ovary bright red; inflorescence a loose, bipinnate panicle 4in. to 6in. long, with a bright rachis; peduncle 1ft. to 1½ft. long, dull red. *l.* twelve to thirty in a rosette, bright green on both sides, lorate, 1ft. to 1½ft. long, 1½in. broad, pliable, ovate at base, cuspidate at apex, with minute teeth. South Brazil, &c., 1854. SYN. *Lamprococcus Weilbachii* (B. H. 1861, p. 305; B. M. 6435; R. G. 539).

Æ. W. leodiensis (Weilbach's, Liége).* *fl.* violet-rose, changing to dark red; bracts scarlet, mixed with violet and green; scape shorter than the leaves. *l.* about forty in a rosette, the basal half armed with larger and more crowded spines than in the type, the upper surface dark olive and bright green, the basal part beneath washed violet-brown and spotted blood-red. Brazil, 1887.

ÆCIDIUM. Formerly these fungi, which belong to the *Uredineæ*, or Rusts, were accorded generic rank; but now they are believed to be but a subordinate stage

Æcidium—*continued.*

in a very complex life-cycle of such genera as *Uromyces* and *Puccinia*. This, however, has not been proved in regard to all the reputed species of this form-genus. An excellent example of this Æcidium-form is to be found in the Barberry Rust (*Æ. berberidis*), which is seen upon the common Barberry and other species in spring, as well as upon the allied genus *Mahonia*, in the form of bright orange-yellow spots on the leaf-blades, stalks, as well as less frequently upon the flowers and the berries. Later they give rise to the purple, brown, and, finally, almost black spots on Wheat and other cereals, and known by the name of *Puccinia graminis*. Nearly a hundred years ago the fungologists of the time thought there was a connection between the two, but it is only within comparatively recent years that the life-cycle has been worked out by the late Professor De Bary. This destructive fungus is not restricted to Wheat and other cereals, but is also found on several species of ornamental and other grasses; hence the specific name (*graminis*). Both uredospores, or summer-spores, and teleutospores exist, the former being differentiated from the latter by being one-celled instead of two-celled. The summer-spores are the means by which the area of infection is spread, and the teleutospores (or final spores), those by which the fungus is tided over the winter, to develop again as soon as the conditions are favourable in the spring. The grain and straw are both rendered useless by this fungus, which is difficult to cope with, as even if there are no Barberries or Mahonias in the vicinity of the Wheat the rust-fungus has been proved to exist.

Other Æcidium-forms occur in species of *Abies*; one, *elatinum*, being very destructive, and responsible for the extraordinary malformations found upon Silver Firs, known as Witches' Brooms. The needles of such infested trees are sickly-looking, and only last one season. Sometimes, too, the extraordinary branch growths proceed from a large, gouty swelling. Yet other species affecting Firs are *Æ. pseudocolumnare*, in the needles of several species of *Abies*, notably on *A. pectinata*; and *Æ. strobilinum* on cones of Spruce. For further information upon Pine Fungi, *see* **Pinus.**

ÆGERIA TIPULIFORMIS. This is an old name for the Currant Clearwing Moth (*Sesia tipuliformis*).

ÆGICERAS. SYN. *Melaspinæa.* This genus is monotypic. The correct name of *Æ. fragrans* is *Æ. majus.*

ÆGILOPS (of Linnæus). A synonym of **Triticum** (which *see*).

ÆGINETIA. A synonym of **Bouvardia** (which *see*).

ÆGIPHILA. SYNS. *Manabea, Omphalococca.* This genus embraces about thirty species, natives of tropical America, from Brazil to the West Indies and Mexico.

Æ. grandiflora. The correct name is *Clerodendron grandiflorum.*

ÆGLE. Golden Apple. This genus embraces two or three species of spiny, stove trees, natives of tropical India, Java, and tropical Western Africa. Flowers white, hermaphrodite, rather large; calyx small, four- or five-toothed; petals four or five, oblong-lanceolate, spreading, imbricated; panicles axillary, few-flowered. Berries large, very hard, with edible pulp. Leaves trifoliolate; leaflets slightly crenulate, pellucid-dotted, membranous. *Æ. Marmelos* is known in India as the Bael-tree.

Æ. sepiaria (hedge-loving). The correct name of *Citrus trifoliata.* SYN. *C. triptera.*

ÆGOCHLOA. Included under **Gilia** (which *see*).

ÆONIA (name not explained by author). Also spelt *Œonia.* ORD. *Orchideæ.* A small genus (four or five species) of stove Orchids, natives of Madagascar, and closely allied to *Angræcum.* Flowers racemose, shortly pedicellate; sepals and petals sub-equal, free; lip sessile at the base of the column, produced into a spur at base;

Æonia—*continued.*

column very short; peduncles lateral, simple. Leaves distichous, coriaceous. Stems not pseudo-bulbous. The following species is the only one calling for mention here. For culture, *see* **Angræcum.**

Æ. polystachya (many-spiked). *fl.* like those of a small Brassavola, but spurred; sepals and petals whitish or greenish; base of the lip green; racemes numerous. *l.* ligulate, bilobed. 1889. SYNS. *Angræcum Kimballianum, A. polystachyum.*

ÆONIUM. Included under **Sempervivum** (which *see*).

AËRANTHUS. This genus embraces about three species. Flowers often solitary, rather large, pedicellate; sepals erecto-patent, free; petals similar to the dorsal sepal, but smaller; lip produced into a spur-like process; column very short. Leaves distichous. To the species described on p. 31, Vol. I., the following should be added. *See also* **Mystacidium,** and for culture *see* **Angræcum** (to which this genus is allied).

A. brachycentron (short-spurred). This scarcely differs from *A. grandiflorus.*

A. Grandidierianus (Grandidier's). A synonym of *Angræcum Grandidierianum.*

A. Leonis (Leon Humblot's). A synonym of *Angræcum Humblotii.*

A. ophioplectron (snake-spurred). A synonym of *Angræcum ophioplectron.*

A. trichoplectron (hair-spurred). *fl.* white, solitary, axillary; sepals lanceolate, acute; petals linear, acute; lip broad, nearly conchoid at base, acuminate at top; spur long, filiform; peduncle one-flowered. February. *l.* 5in. long, ¼in. wide, soft, linear, bidentate at apex. Madagascar.

AERIAL. Growing in the air. Aerial Roots are those that appear above the ground.

AËRIDES. These lovely plants are best grown under stove or hot-house treatment. They require a liberal amount of moisture both at the roots and in the atmosphere, during the growing season. Under cooler conditions, while the plants are at rest, only sufficient moisture is needed to maintain the foliage in a plump condition. Though usually classed as suitable for pot-culture, many *Aërides* are dwarf-growing, and possessing a compact habit they are better adapted for baskets, in which they may be easily suspended near the roof-glass. The most suitable kinds for this purpose are *A. affine, A. crassifolium, A. Lobbii,* and the *A. maculosum* section. If these are removed to the brighter, cooler, and drier conditions of the intermediate house during the resting season beneficial results will be derived; this especially applies to *A. crassifolium,* which is usually a somewhat shy flowerer. Under the above conditions this difficulty is overcome. To the species described on pp. 31-3, Vol. I., the following should be added:

A. ampullaceum (flask-like). A synonym of *Saccolabium rubrum.*

A. Augustianum (Auguste Linden's).* *fl.* light rose-colour, 1in. to 1¼in. long; lip three-lobed, the side lobes falcate, rounded or nearly truncate above, the front lobe much longer, with crenulate margins, slightly bilobed at apex; racemes arching. *l.* 6in. to 7in. long, 1¼in. broad, dark green, bilobed at apex. Philippine Islands, 1890. (G. C. 1890, f. 36; L., t. 210.)

A. Ballantinianum (Ballantine's). A variety of *A. suavissimum.*

A. Bernhardianum (Bernhard's). *fl.*, side lobes of the lip overlapping each other, the front lobe covering both in front; raceme having the appearance of that of *A. quinquevulnerum. l.* narrow, strap-shaped. Borneo, 1885. A distinct and fine species.

A. Brookeii (F. d. S. 151; P. M. B. ix., t. 145) is identical with *A. crispum.*

A. Burbidgei splendens (Burbidge's splendid). *fl.* rich purple; side lobes of the lip ochre, spotted with brown; tip of the spur ochre. 1885.

A. cornutum (horned). A variety of *A. odoratum.*

A. Ellisii (Ellis'). A variety of *A. virens.*

A. Emericii (Emeric Berkeley's). *fl.* pale pink, with darker tips to the perianth segments and purple mid-lobe of the lip, numerous, ½in. in diameter; perianth segments short, incurved, with rounded tips; lip funnel-shaped, passing into the stout,

Aërides—*continued.*

incurved spur; raceme axillary, 5in. to 6in. long, shortly pedunculate. May. *l.* distichous, nearly 1ft. long, 1in. to 1½in. broad, linear, coriaceous, deeply bifid at apex. Andaman Islands, 1832. (B. M. 6723.)

FIG. 30. FLOWERS OF AËRIDES FIELDINGII.

A. expansum (expanded). A synonym of *A. crassifolium.*

A. falcatum compactum (compact). A variety differing from the type principally in its shorter inflorescence, shorter and broader leaves and thicker and stronger stems.

A. f. Houlletianum. The correct name of *A. Houlletianum.* (R. X. O. iii., t. 204.)

A. f. Leoniæ (Mrs. Leonie Allan Goss'). *fl.*, side laciniæ blunt, retuse, even dolabriform. 1882. (W. O. A. vii., t. 328, under name of *A. expansum Leoniæ.*)

A. Fieldingii alba (white). *fl.* snow-white, closely disposed on the spikes. 1883. A lovely variety. (L. 1896, t. 538.) Flowers of the typical plant are shown in Fig. 30.

A. flavidum (yellowish). A synonym of *A. suavissimum.*

A. formosum (beautiful). *fl.* white, spotted, disposed in graceful, pendent spikes; lip trifid, beautifully coloured with amethyst. 1832. A handsome plant, supposed to have been bred between *A falcatum* and *A. odoratum.*

FIG. 31. PORTION OF RACEME OF AËRIDES LAWRENCEÆ.

A. Godefroyanum (Godefroy's). A variety of *A. multiflorum.*

A. Hughii (Hugh Low's). *fl.* well formed, about ten to a spike; sepals pale rose with darker shading; petals pale rose, with darker spots; lip bright rose and purple. *l.* about 6in. long. 1894.

A. Huttoni (Hutton's). A name used in gardens for both *A. Thibautianum* and *Saccolabium Huttoni.*

A. Iansoni (I'Anson's). Probably a natural hybrid between *A. expansum* and *A. odoratum.* Birma, 1890.

A. illustre (lustrous). A form of *A. maculosum.*

Aërides—*continued.*

A. Lawrenceæ (Lady Lawrence's).* *fl.* nearly as large as those of *A. crispum;* sepals and petals white, changing to yellowish-tipped rosy-purple; lip having its side lobes high, oblong-dolabriform, its central lobe tipped rosy-purple, two purple lines running back to the mouth of the spur, which is conical, acute, entire; racemes 2ft. long, bearing upwards of thirty flowers. Tropical Asia, 1832. See Fig. 31. (Gn. 1839, t. 702; W. O. A. vi. 270.)

A. L. Amesianum (Ames's). *fl.* of a rich, pale orange-yellow, larger than in the type, borne on stalks over 2ft. in length; sepals and petals tipped with purple; racemes very long. Malay Archipelago. (R. X. O. iii., p. 252.)

A. L. Sanderianum (Sander's).* *fl.* 1½in. across; sepals and petals creamy-white, tipped magenta, recurved at the margin; lip large, the upper half of the side lobes yellow, frilled at the edges, the middle lobe obovate, folded, magenta; spur greenish-yellow at the end; racemes long. *l.* broad, short, retusely bilobed. Eastern tropical Asia, 1884.

A. Leeanum (W. Lee's). *fl.* sweet-scented, less than 1in. long; sepals and petals rose-purple, white at base; lip small, three-lobed, deep purple, with a green-tipped spur; racemes short and dense. Winter. *l.* 7in. to 9in. long, 1½in. broad. Origin unknown. Allied to *A. quinquevulnerum.*

A. lepidum (charming). *fl.* white, as large as those of *A. affine;* sepals and petals tipped with purple; lip having the projected anterior part purple; spur cylindrical, curved; racemes ascending, many-flowered. *l.* lorate, obtusely bilobed. India. A pretty species.

A. Lindleyanum (Lindley's). A variety of *A. crispum.*

A. Lobbii is now regarded as a form of *A. multiflorum.*

A. L. Ainsworthii (Ainsworth's). *fl.* brighter-coloured than in the type; spikes about 2ft. long. Moulmein. A fine variety.

A. maculosum formosum (beautiful). *fl.* large and numerous; sepals and petals white, marked with numerous rose-purple spots; lip white at base, marked on the crests and auricles with rose-purple lines, the large, elliptic front lobe entirely rose-purple. 1885. A fine form.

A. m. illustre (lustrous). A robust form, having large flowers blotched with purple and tipped with amethyst, and fewer and shorter leaves.

A. margaritaceum (pearly). *fl.* pure white, produced in spikes. Summer. *l.* spotted. India. A pretty species, something in the way of *A. maculosum.*

A. marginatum (margined). *fl.* densely packed on the rachis; sepals and petals pale yellow, the anterior border purple; side lobes of lip semi-oblong, deep orange, the central one oblong-ligulate, toothleted, yellow, changing to sepia-brown; spur light green, conical; racemes drooping. *l.* rather broad; lorate, bilobed or emarginate, keeled on the under-side. Philippine Islands, 1885. Probably a variety of *A. quinquevulnerum.*

A. McMorlandi (McMorland's). *fl.* white, spotted with peach-colour, freely produced in long, branched racemes. June and July. *l.* bright green, nearly 1ft. long. India. A fine but rare species.

A. multiflorum (many-flowered). The correct name of *A. affine* (B. M. 4049; W. S. O. i. 21). *A. Lobbii* (I. H. 1868, t. 569) and *A. roseum* (P. F. G. ii., t. 60; R. G. viii., t. 267) are regarded by Hooker as synonyms or forms of this species.

A. m. Godefroyanum (Godefroy's). *fl.* light rosy-white, streaked and spotted with amethyst on the sepals and petals, comparable with those of *A. maculosum;* lip triangular, with a retrorse, hooked, solid tooth, and a very small, angular spur, the disk rich amethyst. Cochin China, 1886.

A. m. Veitchii (Veitch's).* *fl.* white, dotted with soft rose-pink; racemes long, drooping, branched. June and July. *l.* 8in. long, dark green, spotted. (B. H. 1881, 8-9.)

A. nobile (W. S. O. ser. i., t. 11; R. G., t. 641) is identical with *A. suavissimum.*

A. odoratum birmanicum (Birma). *fl.* smaller than in the type; lateral sepals having a light purple line outside; middle lacinia of the lip purple, very narrow, with a few teeth at the margin; side laciniæ apicular. 1837.

A. o. Demidoffi (Demidoff's). *fl.* white, large, forming a rich spike; tips of the sepals, petals, and lip marked with purple; spur spotted with purple, and tipped with green. 1885. (L., t. 14.)

A. Ortgiesianum (Ortgies'). *fl.*, sepals and petals blotched and warted with purple; side segments of the lip purple, the middle one white, blunt, bilobed, not serrated, the spur green, all dotted and barred red. 1885. This looks like a small *A. quinquevulnerum*

A. pachyphyllum (thick-leaved). *fl.* resembling those of *A. Thibautianum,* few in a short raceme; sepals and petals light crimson-lake, nearly as large as in that species, oblong-ligulate; laciniæ of the lip small, painted with more or less warm purple; spur prominent, and, as well as the column, white. *l.* very fleshy, short. Birma, 1830.

A. paniculatum (panicled). A synonym of *Sarcanthus paniculatus.*

A. Picotianum (Picot's). A synonym of *A. falcatum Houlletianum.*

Aërides—*continued.*

A. platychilum (flat-lipped). *fl.* 1in. across; sepals and petals of a light buff colour; lip yellow and purple, flat, with a reflexed spur; scape 5in. long. *l.* 6in. long, more than 1in. broad. Habitat unknown. 1893. This is closely allied to *A. falcatum Houlletianum.*

A. quinquevulnerum Schadenbergianum (Schadenberg's). A variety of more compact habit, having shorter and broader leaves than the type. 1836. A portion of the inflorescence of the typical species is shown in Fig. 32.

A. radicosum (rooting). *fl.* ⅜in. across; sepals and petals light rose-purple, spotted with deep purple, the lateral sepals largest; lip three-lobed, the mid-lobe deep rose-purple; spur horn-like compressed; pedicels pale rose-purple; peduncles racemose, rarely branched. *l.* 7in. to 10in. long, ⅜in. to 1¼in. broad. Southern India. SYN. *A. rubrum* (of gardens).

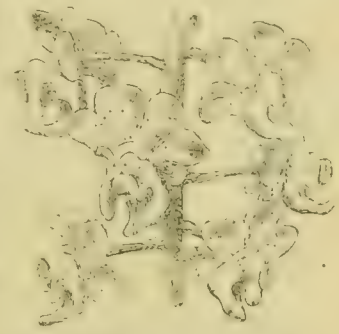

FIG. 32. PORTION OF RACEME OF AËRIDES QUINQUEVULNERUM.

A. Reichenbachii (R. X. O. ii., t. 104) is synonymous with *A. suavissimum* (P. F. G. ii., t. 66).

A. R. cochinchinense (Cochin China). *fl.*, inflorescence denser than in the type; yellow of the lip much deeper. Cochin China. A grand variety.

A. Roebelenii (Roebelen's). *fl.* very fragrant, the size of those of *A. quinquevulnerum*; sepals and petals greenish-white, tipped with white; petals often minutely toothed; lip rosy, with yellow, oblong side lobes lacerated on the upper edge, as is also the much longer, oblong, curved middle lobe; spur short, conical; racemes erect, 1ft. long, about twenty-five-flowered. Philippine Islands, 1884. Probably a variety of *A. quinquevulnerum.*

A. Rohanianum (Prince Camille de Rohan's). A synonym of *A. suavissimum.*

FIG. 33. PORTION OF RACEME OF AËRIDES VIRENS ELLISII.

A. rubrum (red) of gardens. A popular name for *A. radicosum.*

A. Sanderianum (Sander's). A variety of *A. Lawrenceæ.*

A. Savageanum (Savage's). *fl.* less than 1in. across; sepals and petals white stained with crimson-purple in the lower half, the upper half crimson-purple; lip deep crimson-purple, with erect side lobes, a small, incurved middle lobe, and a greenish straight spur; racemes as long as the leaves. *l.* 7in. to 9in. long, 1in. to 1¼in. broad. Origin unknown. (R. ii., t. 81.)

A. Schrœderi (Baron Schrœder's). A form of *A. maculosum.*

A. suavissimum aurantiacum (orange). A much handsomer plant than the type, more robust in growth, and having a deep, rich, orange-yellow lip. Borneo, 1866.

A. s. Ballantinianum (Ballantine's). *fl.* variable; dorsal sepal and petals somewhat toothed; lateral

Aërides—*continued.*

sepals white, with a purple eye-blotch at the top; lip white, with orange or self-coloured side lobes, or marked with purple streaks and transverse bars. A fine variety.

A. s. B. aureum (golden). *fl.* large, sweetly-scented; sepals and petals white, tinged with pink or pale purple; lip having a few tiny dots of brown. 1893. A handsome variety.

A. s. maculatum (spotted). *fl.* delightfully fragrant; sepals and petals white, profusely spotted with pink, as is also the lip.

A. Thibautianum (Thibaut's). *fl.*, sepals and petals rose-coloured; lip bright amethyst; raceme very long, with the flowers rather openly set upon it. Java. Allied to *A. quinquevulnerum.*

A. Vandarum is the correct name of *A. cylindricum* (B. M. 4932).

A. Veitchii (Veitch's). A variety of *A. multiflorum.*

A. virens Dayanum (Day's). A fine variety, with very long racemes. India.

A. v. Ellisii. A portion of the inflorescence of this grand variety is shown in Fig. 33.

A. v. grandiflorum (large-flowered). *fl.* white, spotted with pink, larger and more gracefully disposed than in the type. April and May. India.

A. v. superbum (superb). *fl.* brighter, and spikes longer, than those of the type. India.

A. Warneri (Warner's). A variety of *A. crispum.*

A. Wightianum (Wight's). A synonym of *Vanda parviflora.*

A. Williamsii (W. S. O. ser. i., t. 21) is a form of *A. Fieldingii* (B. H. 1876, t. 18-19; W. O. A. vii., t. 309).

A. Wilsonianum (Wilson's). *fl.*, sepals and petals pure white; lip lemon-yellow. A distinct, dwarf species, in appearance much resembling *A. odoratum.*

ÆRUA (from *Eroua*, the Arabic name). ORD. *Amarantaceæ.* A genus embracing about ten species of stove herbs or under-shrubs, inhabiting the warmer regions of Africa and Asia. Flowers white or brownish, small or minute, in solitary or paniculate spikes. Leaves alternate, opposite, or somewhat whorled. Two of the species have been introduced, but they are probably lost to cultivation.

ÆRUGINOSE. Light bluish-green—the colour of verdigris.

ÆSCHYNANTHUS. About forty species are included in this genus; they are found in the East Indies, the Malayan Archipelago, and Eastern tropical Asia, extending as far as China. To those described on p. 33, Vol. I., the following should be added:

Æ. bracteata (bracteate). *fl.*, calyx lobes red, ⅜in. long; corolla scarlet, 1¼in. long, nearly glabrous outside, the lower lip with reflexed lobes; peduncles 1in. long, one- to seven-flowered; bracts scarlet, 1in. long. April. *l.* elliptic, acuminate, fleshy, 4in. long, cuneate or rounded at base. Branches terete. Temperate Himalayas, 1839. Plant epiphytic. SYN. *Æ. Paxtoni* (J. H. S. iv., p. 79).

Æ. grandiflora parasitica (parasitic). *fl.*, calyx and corolla rather large, and leaves narrower, than in the type, the calyx lobes slightly longer than the tube. (B. iv., t. 167, under name of *Æ. parasitica*; B. R. 1841, t. 49, under name of *Æ. grandiflora*).

Æ. Hildebrandii (Hildebrand's). *fl.* orange-scarlet, few, from the upper leaf-axils, the segments margined with deep red, 1in. long, glandular, pubescent, the tube curved. *l.* rather crowded, opposite and alternate, 1in. long, somewhat fleshy, ovate, narrowed to a very short petiole. Stem creeping; branches 2in. to 4in. high. Birma, 1894. (B. M. 7365.)

Æ. Horsfieldii (Horsfield's). *fl.* pale scarlet; calyx segments linear-lanceolate. August. *l.* ovate-lanceolate, somewhat acuminate. *h.* 2ft. Java, 1842. Plant glabrous. (R. G. 297.)

Æ. maculata (spotted). This is hardly distinguishable from *Æ. ramosissima* except by the small calyx. (B. R. 1841, t. 28.)

Æ. marmoratus (marbled). *fl.* axillary; corolla with a curved, green tube, and an oblique limb of roundish, ciliated segments blotched with chocolate-brown. *l.* oblong-lanceolate, obovate-lanceolate, or ovate, acuminate, scarcely toothed, obscurely veined, reddish-purple below, 3½in. long. Origin unknown, 1882.

Æ. obconica (obconical). *fl.* blood red, in pairs on a very short peduncle; calyx broadly campanulate, nearly 1in. across, with a recurved margin; corolla short, often having yellow lobes banded with red. July. *l.* 2in. to 2½in. long, 1½in. broad, orbicular-ovate, obtuse or slightly acute, fleshy; petioles ⅛in. long. Stem slender, elongated. Malayan Peninsula and Islands, 1825. (B. M. 7336.)

Æ. parasitica (parasitic). A form of *Æ. grandiflora.*

Æschynanthus—*continued.*

Æ. Paxtoni (Paxton's). A synonym of *Æ. bracteata.*

Æ. purpurascens (purplish). *fl.* green; calyx segments dark purple, as long as the corolla. March. *l.* oblong-lanceolate, acuminate, fleshy, sinuate-toothed. Java, 1845. More curious than beautiful. (B. M. 4236.)

Æ. ramosissima (much-branched). *fl.* scarlet; sepals free or united half-way; corolla 1in. long, scarcely contracted. *l.* 4in. long, 1¾in. broad. Sub-tropical Himalayas, 1837. This scarcely differs from *Æ. grandiflora parasitica.* (P. M. B. vi., p. 195.)

ÆSCULARIA ANISOPTERYX. *See* **March Moth.**

ÆSCULUS. Syn. *Hippocastanum.* This genus includes about fourteen species of trees and shrubs, natives of North America and the mountains of Colombia, Mexico, the Himalayas, Persia, and the Malayan Peninsula. Flowers white, red, or pale yellow, polygamous, irregular, disposed in terminal, thyrsoid racemes or panicles; calyx campanulate or tubular, five-cleft; petals four or five, unequal, clawed, imbricated; stamens five to eight, free. Capsules coriaceous, smooth or prickly, three-lobed or sub-globose, three-celled, or by abortion one- or two-celled. Leaves opposite, without stipules, digitately five- to nine-foliolate; leaflets serrated. To the species described on p. 34, Vol. I., the following should be added. *See also* **Pavia** (which is included under this genus by modern botanists).

Æ. californica (Californian). A synonym of *Pavia californica.*

Æ. chinensis (Chinese). *fl.* rather small, disposed in a panicle. *l.* distinctly stalked, oblong-oblanceolate, finely serrated. China, 1889. Syn. *Æ. sinensis.*

Æ. chinensis, of gardens. A synonym of *Æ. turbinata.*

Æ. glabra. There is a double-flowered form of this (*flore-pleno*).

Æ. Hippocastanum has now been definitely proved to be a native of the mountains of Greece.

Æ. macrostachya (large-spiked). A synonym of *Pavia alba.*

Æ. parviflora (small-flowered). A synonym of *Pavia alba.*

Æ. Pavia (Pavia). A synonym of *Pavia rubra.*

Æ. Plantierensis (Plantier's). A garden hybrid between *Æ. Hippocastanum* and *Æ. rubicunda.* 1894.

Æ. rubicunda Watsoniana (Watson's). A variety having darker flowers and shorter stamens than in the type.

Æ. sinensis (Chinese). A synonym of *Æ. chinensis.*

Æ. turbinata (top-shaped). *fl.* white. *fr.* globose-turbinate, without spines; seeds about two in each fruit. Japan, 1838. This tree closely resembles *Æ. Hippocastanum* in general appearance, but is readily distinguishable by its leaves being of a pale greyish colour beneath. Syn. *Æ. chinensis,* of gardens.

Æ. Watsoniana (Watson's). A form of *Æ. rubicunda.*

ÆTHEILEMA. A synonym of **Phaylopsis** (which *see*).

ÆTHIONEMA. About sixteen species, natives of the mountains of Southern Europe, Asia Minor, and Persia, are included in this genus. Flowers pink or purple, small, without bracts, on slender pedicels.

There is no better subject for the rock-garden than *Æ. grandiflorum,* once it is established. It is, however, a true sun-lover, and if a little lime be mixed with the soil in the particular nooks in which it is grown, a fine mass of pink blossom will be produced in summer. Its prostrate habit lends itself well to rockery decoration.

ÆTHONIA. Included under **Tolpis** (which *see*).

AFRICAN CORN LILY. A name applied to Ixias.

AFRICAN CYPRESS. *See* **Widdringtonia.**

AFRICAN HEMP. *See* **Sparmannia africana.**

AFRICAN TOAD-FLOWER. *See* **Stapelia.**

AFZELIA. This genus embraces about ten species of unarmed, stove trees, natives of tropical Africa and Asia. Flowers rather large, racemose; calyx segments four, imbricated; petal clawed, orbicular or reniform, the lower rudimentary ones small or wanting; stamens three to eight, free; racemes crowded in panicles at the tips of the branches. Pods obliquely oblong, compressed. Leaves abruptly pinnate or rarely almost imparipinnate; leaflets in few pairs, coriaceous. *A. africana* is the best-known species.

AGALLOCHUM. A synonym of **Aquilaria** (which *see*).

AGALLOSTACHYS. A synonym of **Bromelia** (which *see*).

AGALMA VITIENSIS. *See* **Heptapleurum vitiense.**

AGALMYLA. Syn. *Orithalia.* This is a monotypic genus, *A. longistyla* being merely a long-styled form of the true species, *A. staminea.*

AGANISIA. Syn. *Koellensteinia.* The half-dozen species of this genus are confined to tropical America. To those described on p. 35, Vol. I., the following should be added:

A. cærulea. The correct name is *Acacallis cyanea.*

A. cyanea (blue). *fl.* rather small, in a short, erect raceme; sepals and petals white, ovate, acute; lip blue, roundish-cuneate, undulated at the tip; scapes slender. June. *l.* evergreen, forming a close, upright tuft, broadly lanceolate, strongly ribbed. Columbia. Syn. *Warrea cyanea* (B. R. 1845, 28).

A. c. alba (white). *fl.* pure white. 1885.

A. lepida (scaly). *fl.* pure white, about 1½in. across, very handsome, disposed in tall, many-flowered spikes. *l.* erect, Grass-like. Brazil, 1893. A well-marked species. (L. 400; R. X. O. 1865.)

A. tricolor (three-coloured). *fl.* closely resembling those of *A. cyanea,* but the sepals are whitish on both sides, the petals are light blue, and the callus of the saddle-shaped, orange-brown lip is different in shape. Amazons, 1886. A fine Orchid.

AGANOSMA. This is regarded by Bentham and Hooker as synonymous with **Ichnocarpus** (which *see*).

AGAPANTHUS. Syns. *Abumon, Mauhlia.* According to Baker ("Flora Capensis," vol. iii.) this genus is monotypic. To the varieties described on p. 36, Vol. I., the following should be added:

A. umbellatus atrocæruleus (dark blue). *fl.* of a beautiful dark violet.

A. u. giganteus (gigantic). A very robust form, with a very large umbel of 150 to 200 dark blue flowers, and leaves 2in. broad. *h.* 3ft. to 4ft. 1879.

A. u. pallidus (pale). *fl.* a pale porcelain-blue.

A. u. Saundersonianus (Saunderson's). *fl.* darker than in the type.

AGAPETES. This genus includes about twenty-five species, natives of India, the Malayan Peninsula, and Fiji. To those described on p. 36, Vol. I., the following should be added:

A. macrantha (large-flowered). *fl.* white, yellow, and red; corolla 1¾in. long, ¼in. to ⅜in. broad. December. *l.* shortly petiolate, lanceolate, narrowed at both ends. Khasia, Moulmein, &c., 1849. This closely resembles *A. variegata,* but has much larger flowers. Syn. *Thibaudia macrantha* (B. M. 4566).

A. Mannii (Mann's). *fl.* white, ¼in. long, with a cylindrical corolla. *l.* lanceolate. Branches almost glabrous. Otherwise like *A. obovata.* Northern India, 1892. Greenhouse.

A. obovata (obovate). *fl.* reddish-brown, solitary, about ¼in. long, borne on stalks scarcely as long as the leaves. *l.* coriaceous, obovate, about ¼in. long. Branchlets scurfy and thickly leafy. Northern India, 1892. A dwarf, densely-branched, not very ornamental, greenhouse shrub.

A. pulcherrima (very pretty). A synonym of *A. variegata,* with which *Thibaudia pulcherrima* (B. M. 4303) and *T. variegata* are also identical.

AGARICUS. To this genus belong several very destructive and common fungi met with upon various conifers and other subjects, as well as upon orchard trees. The best known is *A. melleus (Armillaria mellea),* or Honey Agaric, an edible fungus found in late summer upon trees of many kinds, but particularly upon Spruce, Pines, Larch, Beech, and less often upon Plum. This species, fully dealt with under **Pine Fungi,** is responsible for the condition known as Tree-Root Rot. Not so well known as the Honey Agaric is *A. adiposus (Pholiota adiposa),* a species with bright yellow slimy cap, covered with reddish-brown scales; the gills are yellow, changing to reddish-yellow, and the reddish pileus scales extend on to the stem. Like *A. melleus,* it grows in clusters; but, unlike that species, it is not edible. This is found much later than *A. melleus,* and on both living and dead

Agaricus—*continued.*

wood. Firs, again, are the principal host-plants, and the wood of stems so attacked breaks up in a remarkable manner as the fungus spreads, and usually takes on an unhealthy, yellowish-brown colour. Trees subject to canker are frequently attacked by this species, whose sporospores may be found growing out of the wounds caused by the canker-fungus. Besides being of a bright yellow, the cap, as well as the stem, is covered with darkish scales. See **Pine Fungi** and **Honey Agaric** for remedies.

AGARISTA (a name of mythological origin, after the beautiful daughter of Clisthenes; in allusion to the beauty of the flowers). SYN. *Amechania.* ORD. *Ericaceæ.* A genus embracing about twenty-two species of greenhouse, glabrous or pubescent, usually evergreen shrubs, natives of Brazil, New Granada, Peru, and Mexico. Flowers white, pink, red, or purple, in axillary and terminal racemes; calyx free, five-lobed or parted; corolla conico-tubular or urceolate, with five recurved teeth; stamens ten, included; filaments shortly adherent. Leaves alternate, hard, coriaceous, reticulate-veined. The two species here described thrive in a compost of peat and sand. Cuttings, not too young, will strike in sand, under a hand-glass, in moderate heat. *See also* **Agauria.**

A. neriifolia (Nerium-leaved). *fl.* crimson, urceolate, tubular, secund, drooping, disposed in a terminal, racemose panicle. June. *l.* petiolate, oblong-lanceolate, acute, 3in. long, 1in. broad, ovate at base, coriaceous, entire, pale beneath. *h.* 2ft. Brazil, 1849. Plant highly glabrous. SYNS. *Andromeda neriifolia, Leucothoe neriifolia* (B. M. 4593).

A. pulchra (pretty). *fl.* greenish-white, in axillary and terminal racemes. May. *l.* petiolate, ovate, mucronate, coriaceous, entire. Branchlets obtusely angular. *h.* 2ft. Brazil, 1846. SYNS. *Andromeda pulchra, Leucothoe pulchra* (B. M. 4314).

AGARISTA (of De Candolle). Included under **Coreopsis** (which *see*).

AGATHÆA. Blue Marguerite; Cape Aster. Bentham and Hooker refer this genus to *Felicia*, but the correct name of *A. cœlestis* is *Aster rotundifolius.*

A. amelloides (Amellus-like). A synonym of *A. cœlestis* (*rotundifolius*).

AGATHELPIS (from *agathos*, pleasant, and *thelpis*, hope; reason for name not obvious). ORD. *Selagineæ.* A small genus (less than half-a-dozen species) of greenhouse shrubs or under-shrubs, natives of South Africa. Calyx limb shortly five-cleft; corolla spreading, star-like; stamens two, affixed above the middle of the tube; spikes usually slender, elongated. Leaves scattered, linear or small. *A. angustifolia* and *A. parvifolia* have been introduced, but it is doubtful if they are still in cultivation.

AGATHIS. According to the authors of the "Genera Plantarum," this is the correct name of **Dammara** (which *see*).

AGATHOMERIS. A synonym of **Humea** (which *see*).

AGATHOPHYLLUM. This is now regarded as a synonym of **Ravensara** (which *see*).

AGATHOSMA. As many as a hundred species are included in this large genus.

A. acuminata is a variety of *A. imbricata.*

A. bruniades is a variety of *A. cuspidata* (the type is not in cultivation).

A. villosa (villous). *fl.* flesh-coloured, lilac, or white. *h.* 1ft. or more. This is probably identical with *Diosma Wendlandi.*

AGATHOTES. A synonym of **Swertia** (which *see*).

AGATI. This is now included, by Bentham and Hooker, under *Sesbania, A. coccinea* being regarded as a form of **S. grandiflora** (which *see*).

AGAURIA (name not explained by author). SYNS. *Agarista* and *Leucothoe* (in part). ORD. *Ericaceæ.* A small genus (four species) of greenhouse, evergreen, highly glabrous or glandular-pubescent shrubs or small trees, natives of tropical Africa, Madagascar, and Mauritius. Flowers generally white, in axillary and terminal racemes; calyx free, five- or six-cleft or parted; corolla cylindrical with five recurved teeth; stamens ten to twelve, included. Leaves almost opposite and alternate, oblong or lanceolate, entire, pale beneath. For culture of the two species described, *see* **Andromeda.**

Agauria—*continued.*

A. buxifolia (Box-leaved). *fl.* pink, in terminal racemes; pedicels somewhat secund. Summer. *l.* very shortly petiolate, coriaceous, highly glabrous, broadly ovate or nearly oblong, mucronate, somewhat cordate at base, glaucous and at length almost ferruginous beneath. *h.* 1ft. Mauritius, 1822. Greenhouse. SYN. *Andromeda buxifolia* (B. M. 2640; L. B. C. 1494).

A. salicifolia (Willow-leaved). *fl.* purplish-violet or (in cultivation) whitish; corolla oval-oblong; pedicels spreading-recurved, somewhat secund. June. *l.* petiolate, narrow-lanceolate, acuminate at both ends, entire, green above, woolly beneath. *h.* 4ft. Mauritius, 1825. Hardy. SYN. *Andromeda salicifolia* (B. M. 3286; H. E. F. iii., t. 192).

AGAVE. Including *Littæa.* According to J. G. Baker's monograph of the *Amaryllideæ*, this genus embraces nearly 140 species, natives of tropical America, and especially plentiful in the Southern United States. Flowers greenish-yellow; perianth tube short, the segments almost equal, oblanceolate, falcate; stamens inserted at or below the throat of the tube; filaments filiform, usually much longer than the segments; inflorescence densely sub-spicate or a thyrsoid panicle; peduncle having only reduced leaves. Fruit an oblong capsule, loculidally three-valved. Leaves densely rosulate, more or less fleshy and usually firm in texture, with a pungent spine at the tip and numerous horny prickles on the margins. The great majority of Agaves are *monocarpic, i.e.*, only fruiting once. Several *polycarpic* species have been noted at Kew, and it is worthy of mention that all these belong to the sub-genus *Littæa*, in which the flowers are borne in pairs, forming a dense sub-spicate inflorescence. So far as is known at present, none of the sub-genus *Euagave*, of which the common *A. americana* may be taken as the type, are polycarpic, but die after flowering.

To the species and varieties described on pp. 38-42, Vol. I., the following should be added:

A. albicans (B. M. 7023). This is scarcely more than a variety of *A. micracantha.* There is a form with variegated leaves.

A. Alibertii (Alibert's). *fl.* 1in. long, on short pedicels; perianth tube greenish, funnel-shaped, the segments short, lanceolate-deltoid; peduncle (including the lax, simple raceme) 4ft. to 5ft. high. *l.*, produced ones ten to twelve, lanceolate, denticulate, forming a rosette. Probably Mexico, 1877. SYN. *Alibertia intermedia.*

A. angustissima (very narrow). *fl.* yellow, with purple stamens, borne in pairs, 1½in. long, very narrow; peduncle 12ft. high. *l.* 12in. to 20in. long, ¼in. broad, flat on both sides, the margins filiferous, the apex pungent. Mexico, 1893. Allied to *A. filifera.* (G. and F. 1893, vi., p. 5, f. 1.)

A. atrovirens is the correct name of *A. Salmiana.*

A. attenuata (R. H. 1875, p. 149, f. 31, 32). SYNS. *A. glaucescens* (B. M. 5333; G. C. 1887, ii., p. 219, f. 55), *A. spectabilis*, of gardens.

A. Baxteri (Baxter's). *fl.* disposed in a thyrsoid, loose panicle 4ft. to 5ft. long; perianth tube yellow, ¼in. long, dilated at the middle; filaments ⅜in. to 1in. long; anthers linear, ¼in. long; ovary cylindrical-trigonous, 1in. long; peduncle 4ft. to 5ft. long before the flowers appear. March. *l.* about thirty in a dense, sessile rosette, oblanceolate, about 1ft. long, and 3in. across at the widest part, the tip pungent, brown, shortly decurrent, the marginal spines spreading, hooked, deltoid-cuspidate, brown, about ⅛in. long. Mexico (?).

A. Beauleuriana (Beauleur's). A synonym of *A. Theometel.*

A. Bouchei (Bouche's). *fl.* greenish-yellow, 1½in. long, including the ovary; spike dense, 2ft. long. *l.* thirty or forty in a dense rosette, oblong-lanceolate, rather fleshy, 1½ft. to 2ft. long, 3in. to 4in. broad, ½in. thick, with very small, reddish-brown teeth. Caudex short, cylindrical. Mexico, 1861. (B. M. 7558.)

A. bracteosa (bracted). *fl.* in pairs, forming a dense spike; perianth segments about ½in. long, the ovary slightly longer; stamens about 2in. long; stem 3ft. high, the flowerless part densely covered with spreading or recurved bracts 5in. to 6in. long. *l.* ten to fifteen, broadly linear-attenuate, 1½ft. to 1¾ft. long, 1½in. broad at base, the margins minutely serrulated. Monterey, Mexico, 1883. (G. C. 1892, ii., p. 776, f. 138, 139.)

A. Celsiana. There is a small variety of this, having leaves only 8in. to 9in. long.

A. Fenzliana differs from *Hookeri* in its smaller prickles.

A. Franzosini (Francesco Franzosini's). *fl.* green and yellow, borne in a huge, candelabrum-like panicle, on a stout peduncle

Agave—*continued.*

40ft. long. *l.* thirty or forty in a rosette, oblong-spathulate, persistently glaucous, 8ft. to 9ft. long, 1ft. broad, very rigid, with a very pungent end-spine decurrent for about 6in., and distant, dull brown, hooked or straight teeth. 1892. Plant stemless. (G. C. 1892, xii., p. 179, f. 31.)

A. geminiflora (twin-flowered). *fl.* greenish-brown, 1½in. to 2in. long; tube ¼in. long; peduncle 18ft. to 24ft. long, including the dense spike. *l.* 200 to 300 in a dense rosette, recurved, linear, 1½ft. to 2ft. long, ¼in. to ½in. broad, bright green, convex on both sides, the pale edge splitting off into fine threads, the tip slightly pungent. Mexico, 1797. Stemless. (B. R. 1145.) SYNS. *Bonapartea juncea* (of gardens), *Littæa geminiflora.*

A. Ghiesbreghtii is identical with *A. pruinosa.*

A. glaucescens (bluish-grey). A synonym of *A. attenuata.*

A. Haseloffii (Haseloff's). *fl.* green, 1½in. long; tube short; segments ¼in. long; peduncle 7ft. long, including the dense spike (2ft.). *l.* about twenty in a rosette, lanceolate, 1½in. to 2in. long, 3in. broad, the end-spine brown, ¼in. long, the marginal teeth close and brown. Probably Mexico. Plant shortly caulescent. (B. M. 7527.)

A. Henriquesii (Henriques'). *fl.*, perianth segments tinged dark brown, lanceolate, 1in. long; style purplish-brown; panicle spike-like; peduncle, including the inflorescence, 12ft. to 14ft. long. *l.* in a dense rosette, oblong-lanceolate, bright green, margined with dark brown, 2ft. long, 5in. broad, narrowed to the base and to the pungent apex, armed with spreading prickles. Mexico (?), 1887. (G. C. 1887, i., p. 732, f. 70.) SYN. *Littæa Henriquesii.*

A. heteracantha (variable-spined). A garden synonym of *A. multilineata.*

A. Hystrix (Hystrix). A synonym of *A. striata.*

A. Ixtli (native name) and **A. ixtlioides** (Ixtli-like). These are synonymous with *A. rigida.*

A. Jacquiniana (Jacquin's). A variety of *A. lurida.*

A. kewensis (Kew). *fl.* unknown. *l.* thirty to forty in a rosette, oblanceolate-oblong, 3½ft. to 4ft. long, 7in. to 8in. broad, bright green, the somewhat pungent end-spine short and brown, the face concave in the middle, the marginal prickles small, close and brown. Mexico. Plant shortly caulescent. (B. M. 7532.)

A. laxifolia (lax-leaved). *fl.* green, about 2in. long, including the ovary; stamens 2in. long; anthers very large, linear; panicle lax, 4ft. to 5ft. long; peduncle the same length. *l.* twenty to thirty in a lax rosette, oblong-lanceolate, firm, 1½ft. to 2ft. long, with copious very small marginal spines and a pungent one at the apex. Mexico. Plant shortly caulescent. (B. M. 7477.)

A. Leopoldii II. (Leopold II.'s). *l.* succulent, very numerous, narrow, deep green, acutely pointed, the thin shreds on the margin pure white and curiously curled. 1893. A garden seedling.

A. lurida (lurid). *fl.* greenish-yellow, 3in. long, the tube ½in. long; stamens twice as long as the segments; peduncle 12ft. to 16ft. long, including the thyrsoid panicle (3ft. to 6ft.). June. *l.* thirty to forty in a rosette, oblanceolate, 2ft. to 3ft. long, 2½in. to 3½in. broad, very glaucous, the pungent end-spine 1in. long, the small, rather distant prickles reddish-brown, changing to black. Mexico, 1731. Plant nearly or quite stemless. (B. M. 1522; Ref. B. 307.)

A. l. Jacquiniana (Jacquin's). *fl.* small. *l.* 2½ft. to 3ft. long. Trunk 1ft. to 1½ft. long. 1848. (B. H. ix., t. 25, and B. M. 5097, under name of *A. Jacquiniana.*)

A. maculata (spotted). *fl.* purplish-green, 1½in. long, in a lax, somewhat spicate raceme 6in. to 12in. long; peduncle 1½ft. to 3ft. long, the bract-leaves few and much reduced. *l.* twelve to twenty in a rosette, lanceolate, spreading, 6in. to 12in. long, ¾in. to 1in. broad, glaucous-green, with irregular brown blotches on both sides, the point not pungent, the edges serrulated. Texas, 1856. Stemless. SYN. *A. maculosa* (B. M. 5122; G. C. 1872, p. 1194, f. 273).

A. maculosa (spotted). A synonym of *A. maculata.*

A. Maximowicziana (Maximowicz'). *fl.* green, sessile, borne in pairs, disposed in a cylindrical spike; peduncle, including the spike, 6ft. to 7ft. high. *l.* in a dense rosette, obovate-lanceolate, 3½in. broad, densely and irregularly toothed, the terminal spine sometimes forked. 1889. Allied to *A. densiflora.*

A. mexicana (Mexican). *fl.* greenish-yellow, 2½in. to 3in. long; peduncle 18ft. long, including the thyrsoid panicle (7ft. to 8ft.). *l.* twenty to thirty in a rosette, oblanceolate-spathulate, 2ft. to 3ft. long, 5in. to 6in. broad, very glaucous, the brown, pungent point 1in. long, the prickles rather distant, ¼in. to ½in. long. Mexico. Stemless. A common plant in European gardens. (G. C. 1883, i., f. 22.)

A. mitis (mild). *fl.* about 2in. long, the segments about as long as the tube; peduncle 9ft. to 10ft. long, including the dense spike (3ft. to 4ft.). *l.* about thirty in a rosette, oblanceolate, 1ft. to 1½ft. long, 3in. broad, bright green, flat in the middle, the end-spine weak, the crowded teeth very small. Mexico, 1860. Shortly caulescent. (G. C. 1877, ii., p. 717, f. 137.) SYN. *Littæa mitis.*

Agave—*continued.*

A. Morrisii (Morris'). *fl.*, perianth bright yellow, 2in. to 2½in. long; stamens nearly twice as long as the segments; panicle thyrsoid, the main branches 1½ft. long; peduncle, including the inflorescence, 15ft. to 20ft. long. *l.* twenty or more in a dense rosette, oblanceolate-spathulate, 6ft. to 7ft. long, nearly 1ft. broad, gradually narrowed to the pungent-spiny apex, dull green, the margins prickly. Jamaica, 1887. (G. C. 1887, i., p. 643, f. 105.)

A. multilineata (much-lined). *fl.* 1½in. long; tube very short; spike slender, not dense, finally 5ft. long; peduncle 3ft. long. Autumn. *l.* thirty to forty in a dense rosette, ensiform, 1ft. long, 1in. broad, gradually narrowed to a pungent apex, with a narrow grey edge, small irregular teeth, rounded on the back, with copious darker green lines. Probably Mexico. Stemless. SYN. *A. heteracantha* (of gardens).

A. Nickelsi (Nickels'). This is described as a new species, resembling *A. Victoriæ Reginæ.* 1895.

A. Poselgerii is identical with *A. heteracantha.*

A. pubescens (downy). *fl.* greenish, 1½in. long; tube longer than the segments; spike 6in. long, loosely twelve- to fifteen-flowered; peduncle 3ft. long. *l.* twelve to fifteen in a rosette, spreading, lanceolate, 9in. to 12in. long, 1in. to 1½in. broad, papillose and minutely pubescent all over, dull green, spotted with purple towards the base, not serrulated. Mexico, 1870. (R. G. 1873, p. 227, t. [illegible].)

A. regia (royal). *fl.* unknown. *l.* twelve to fifteen in a rosette, oblong-spathulate, 1½ft. to 1¾ft. long, 4in. to 5in. broad, bright green on the flat face, the somewhat pungent brown tip ¼in. long, the prickles moderately close, very small, brown, the upper ones ascending, the lower ones deflexed. Probably Mexico. (G. C. 1877, ii., p. 620, f. 124). SYN. *A. revoluta* (of gardens).

A. revoluta (revolute). A garden synonym of *A. regia.*

A. rigida (rigid). *fl.* greenish, 1½in. to 2in. long, the tube very short; stamens twice as long as the segments; peduncle, including the thyrsoid panicle, 12ft. to 15ft. long. *l.* thirty to forty in a rosette, ensiform, 1½ft. to 2ft. long, 1½in. to 2in. broad, rigidly erecto-patent, glaucous, the end-spine 1in. long, the teeth small, brown or nearly black. South Mexico. Plant nearly or quite stemless, yielding a valuable fibre. SYNS. *A. Ixtli, A. ixtlioides* (B. M. 5395).

A. Salmiana (R. H. 1873, p. 373, tt. 40, 41; G. C. 1871, ii., p. 141, t. 31; 1877, ii., f. 33). The correct name is *A. atrovirens.*

A. Schottii (Schott's). *fl.* bright yellow, 2in. long; panicle lax, somewhat spicate, 1ft. long; peduncle and pedicels very short; scape 4ft. to 5ft. long. *l.* forming a dense, sessile rosette, linear from an ovate base, 1ft. long, pungent at apex, the edges breaking up into fibres. Arizona. (B. M. 7567.)

A. spectabilis (remarkable). A garden synonym of *A. attenuata.*

A. striata (B. M. 4950). SYN. *A. Hystrix;* also known in gardens as *Dasylirion junceum* and *Yucca Hystrix.*

A. Taylori (Taylor's). A garden hybrid between *A. geminiflora* and probably *A. filamentosa* ("not *A. densiflora*"—Baker).

A. Terraccianoi (Dr. Terracciano's). *fl.* greenish-yellow, sessile, solitary or in pairs in the axils of the bracts; inflorescence about 5ft. high. *l.* many in a rosette, narrow-lanceolate, about 1ft. long, 2in. broad, deep green, speckled with blood-red. Probably Mexico or Texas, 1895. (R. G. 1895, p. 66, f. 14.)

A. Theometel (native name). *fl.* yellowish-green, 3in. long; stamens twice as long as the segments; peduncle 10ft. to 12ft. long, including the thyrsoid panicle. *l.* about thirty, oblong-spathulate, 1½ft. to 2ft. long, 4½in. to 5in. broad, nearly flat on the face, green, the dark brown end-spine 1in. long, the distant prickles ¼in. long. Mexico. Stemless. SYN. *A. Beauleuriana.*

A. univittata variegata (variegated). *l.* deep bronzy green, margined with white, and having a band of bright green running down their centre. 1893. A handsome seedling.

A. Villarum (Villa Brothers'). *l.* quite spineless, as in *A. filifera,* but much longer, more spreading, and less dense. 1886. An Italian hybrid between *A. filifera* and *A. zylonacantha,* the former being the seed-bearer.

A. vivipara. This name is also applied in gardens to *A. sobolifera* (G. C. 1877, ii., f. 150).

A. weissenburgensis (Weissenburg). *fl.* erect, tubular, 1½in. long, disposed in clusters along the side of a long flower-stalk, which, with the panicle, measures 7ft. to 8ft. *l.* thirty to forty, 8in. to 9in. long, 2½in. broad, upwards of ¼in. thick, oblong-lanceolate, mucronate, with remote, spiny teeth on the margins. Probably Mexico, 1885.

AGENORA. Included under **Hypochæris** (which *see*).

AGERATUM. SYN. *Carelia* (of Adanson). Bentham and Hooker include here *Cœlestina,* which has been described on p. 356, Vol. I. This genus embraces about sixteen species of herbs and shrubs, natives of tropical or sub-tropical America, one being broadly distributed over the warmer regions of the globe.

Ageratum—*continued.*

Few bedding-plants are superior to Ageratums alike as regards their freedom of colour of flowers, and the time over which their beauty extends. Frequently they are the last of the summer occupants of beds and borders to succumb to frost; while they are most useful in providing cut-flower material throughout the season. Where it is not desired to utilise them as bedding-plants they may be effectively employed as edgings—the Imperial Dwarf Azure and the Imperial Dwarf Blush White being very suitable on account of their compactness of habit—a quality which is wanting in some few of the garden varieties.

To the species described on p. 42, Vol. I., the following should be added:

A. corymbosum (corymbose). The correct name of *Cœlestina ageratoides.*

A. strictum (erect). A synonym of *Adenostemma viscosum.*

A. Wendlandi (Wendland's). *fl.* blue, with rosy reflections, produced in abundance. *l.* cordate, dark green. Stems hairy. Mexico, 1885. A dwarf, compact species.

AGLÆA. A synonym of **Melasphærula** (which *see*).

AGLAONEMA. About a score species—all tropical—are included here. Spadix sessile or stipitate; spathe straight, at length marcescent; peduncles fascicled. Leaves ovate- or oblong-lanceolate. To the species described on p. 42, Vol. I., the following should be added:

A. acutispathum (acute-spathed). *fl.*, spadix sessile, 1¾in. long; spathe light green, 3¼in. long, 1¼in. broad, ovate-lanceolate, acuminate, widely expanded; scape as long as the petioles. *l.* 6in. to 8in. long, 2½in. to 3½in. broad, elliptic-ovate, acuminate, slightly oblique, rounded and slightly cuneate at base, the apex gradually attenuated into a fine point 1in. long; petioles 3in. to 4½in. long, sheathing. Hong Kong (?), 1885. Nearly hardy.

A. angustifolium (narrow-leaved). *fl.*, spathe whitish, 1½in. long, ellipsoid; spadix, including the stalk, 1½in. long. *l.* 5in. to 9½in. long, ½in. broad, elongated-linear-oblong, acuminate, cuneate-rounded at base, the margins undulated; petioles 1½in. to 2in. long. Stem ¼in. thick, erect, shining. Penang, 1895.

A. costatum (ribbed). *fl.*, spathe light green, 1in. long; spadix very large, protruding. *l.* 4in. to 5in. long, 2½in. to 3in. broad, ovate, acute or cuspidate, retuse or somewhat cordate at base, dark green, spotted and veined with white; midrib stout. Perak, 1892.

A. Curtisii (Curtis's). A variety of *A. oblongifolium.*

A. Hookerianum (Hooker's). *fl.*, spathe dark green, cymbiform, 1½in. to 2in. long, oblong, cuspidate. *l.* 8in. to 11in. long, 3½in. to 4½in. broad, elliptic-ovate or elliptic-oblong, acuminate. Stem elongated, ½in. thick. Khasia Hills, 1874.

A. integrifolium (entire-leaved). A synonym of *A. oblongifolium.*

A. Lavallei (Lavalle's). A synonym of *Schismatoglottis Lavallei.*

A. nebulosum (clouded). *l.* 5in. to 8in. long, 1in. to 1½in. broad, oblong or obovate-oblong, obliquely cuspidate-acuminate at apex, obtuse at base, green, irregularly marked with greenish-white above; petioles 1½in. to 2in. long, channelled above, sheathed. Java, 1887. (I. H. ser. v. 24).

A. nitidum (shining). A synonym of *A. oblongifolium.*

A. oblongifolium (oblong-leaved). *fl.*, spathe green, margined with white, 2in. to 4in. long, cuspidate; spadix stout, nearly as long as the spathe; peduncle 4in. to 8in. long. *l.* 8in. to 2ft. long, 2in. to 4in. broad, linear-oblong, acuminate, acute at base, dark green, shining; petioles 4in. to 6in. long. Stem 1ft. to 3ft. high. Penang, &c. SYNS. *A. integrifolium, A. nitidum.*

A. o. Curtisii (Curtis's). *l.* variegated with white along the principal lateral veins. Penang, 1897.

A. pictum compactum (compact). *fl.* spathe green, pointed, the outer surface shining. *l.* short, oblong-ovate, acuminate, unequal-sided, dark sap-green, sparingly blotched grey; petioles sheathing, green, with a membranous, whitish margin. Stems very short, erect. Java, 1883. There is another variety, *gracile.*

A. pumilum (dwarf). *fl.*, spathe ⅜in. long. *l.* 3in. to 4½in. long, ovate or ovate-lanceolate, acuminate, rounded at base, deep sea-green, marbled and blotched with white; petioles shorter than the blades. Caudex rooting. Birma, 1894.

A. rotundum (round). *fl.*, spathe green, hooded, 2½in. long. *l.* roundish-ovate, 5in. long, dark green tinged with pink above, purple beneath. Stems short. Malaya (?), 1893. (J. H. xxvii., p. 379, f. 56.)

A. versicolor (variously coloured). *l.* ovate, green in two shades, with white patches. East Indies, 1893. The genus of this plant is uncertain.

AGNUS-CASTUS. *See* **Vitex Agnus-castus.**

AGONIOPTERIS. *See* **Acrostichum.**

AGONIS (from *agon*, a gathering, a collection; in allusion to the number of the seeds). SYN. *Billiottia* (of Brown). ORD. *Myrtaceæ.* A genus comprising ten species of greenhouse, evergreen shrubs or small trees, natives of West Australia. Flowers rather small, sessile, in dense, globose, axillary or terminal heads; calyx segments five, often scariose; petals five, spreading; stamens free, sometimes ten, opposite and alternate with the petals, sometimes twenty or more; bracts imbricating, often involucrate. Leaves alternate, often crowded on the branchlets, small or narrow and coriaceous, entire. *A. flexuosa* and *A. marginata* are rare in this country, but are grown at Kew. They should be firmly potted in a compost of turfy loam and peat, with a liberal addition of sand. Water must be frequently given during the growing season, but more sparingly during winter. In autumn the plants may be placed in a sheltered and sunny position, to ripen their wood and induce the formation of buds. In the South of England these plants may prove hardy. Propagation may be effected by cuttings of the half-ripened shoots, inserted in sandy peat, under a bell glass.

A. flexuosa (flexible). *fl.-heads* white, axillary, surrounded by broad bracts, which, with the numerous long, white stamens, are the most attractive features of the inflorescence. Summer. *l.* lanceolate, like those of the Willow, smooth, dark green, the margins tinged with purple. *h.* (in Australia) 40ft.; may be limited to the size of a small pot shrub. (Gn. xxix. 534.)

A. marginata (margined). *fl.-heads* white, axillary and terminal, about twenty-flowered; petals small; stamens long, hair-like. Summer. *l.* coriaceous, slightly hairy, in other respects like those of the common Box. Branches twiggy, numerous, the youngest ones silky-hairy. SYN. *Fabricia stricta.* (L. B. C. 1219.)

AGOSERIS. A synonym of **Troximon** (which *see*).

AGRICOLÆA. A synonym of **Clerodendron** (which *see*).

AGRILUS. ORD. *Coleoptera.* Out of some 500 known species only five are found in Britain. They usually inhabit the stems of young Beech; but one species, a most beautiful insect, is credited with inflicting damage upon Roses. It is, however, such a rare insect that the likelihood of a severe attack is very remote.

AGRIOTES. ORD. *Coleoptera.* To this genus belong several most destructive species in the garden, as their larvæ, together with those of a few others, are popularly known as "Wireworms." The worst offenders are *A. sputator*, ⅓in.; *A. obscurus*, ⅓in.; and *A. lineatus*, ⅓in. The female beetles deposit their eggs, which are of a dirty white, either in the soil close to the food-plants on which they have elected the larvæ when hatched

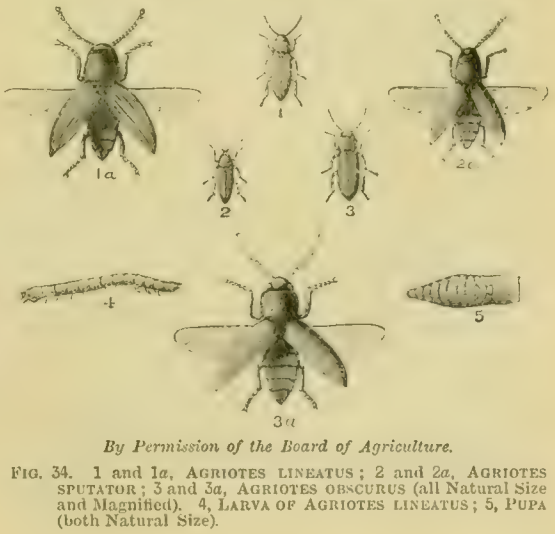

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FIG. 34. 1 and 1*a*, AGRIOTES LINEATUS; 2 and 2*a*, AGRIOTES SPUTATOR; 3 and 3*a*, AGRIOTES OBSCURUS (all Natural Size and Magnified). 4, LARVA OF AGRIOTES LINEATUS; 5, PUPA (both Natural Size).

Agriotes—*continued.*

shall feed, or else in the plants themselves, towards the base. The larvæ live a long time as grubs, three to even five years. Finally, they become yellowish-white pupæ in cells of soil. See Fig. 34. *See* **Wireworms.**

AGRIPHYLLUM. A synonym of **Berkheya** (which *see*).

AGROPYRUM. A genus of Grasses, comprising one or two British species. *See* **Triticum.**

AGROSTEMMA. Bentham and Hooker include this genus under **Lychnis** (which *see*), the specific names remaining unchanged. To the species described on p. 43, Vol. I., the following should be added:

A. Walkeri (Walker's). *fl.* richly coloured, compact, and very freely produced. 1890. A garden hybrid between *A. coronaria* and *A. flos-Jovis.*

AGROSTICULA. A synonym of **Sporobolus** (which *see*).

AGROSTIS. Syn. *Vilfa* (of Adanson). Nearly a hundred species are embraced in this genus; they are broadly dispersed over the globe, but are mostly found in North temperate regions. *See also* **Sporobolus.**

A. algeriensis (Algiers). A garden synonym of *Aira capillaris.*
A. capillaris (hair-like), of gardens. A synonym of *A. nebulosa.*
A. capillaris, of Thore. A synonym of *A. elegans.*
A. Spica-venti. The correct name is *Apera Spica-venti.*

AGROTIS. A very large genus of moths, several of whose Caterpillars are amongst the most destructive of garden insects. The chief depredators, however, are *A. segetum*, or Turnip Moth, and *A. exclamationis*, the Heart and Dart Moth. In this country the larvæ are amongst those popularly known as Surface Caterpillars, because of their habit of feeding just beneath the surface of the soil. In America some near allies are known as Cutworms, and are, if anything, more destructive than their English relatives. The latter popular name is a very appropriate one, and is in allusion to the insects' habits of severing the stems of their food-plants. All the members of the family seem practically omnivorous, and by reason of their very accommodating tastes they are most objectionable visitors to flower-gardens, market-gardens, and agricultural lands. The Moths are on the wing in summer, and the eggs are deposited on the leaves of the plants on which they have elected to feed, but close to the ground. As stated in Vol. III., the larvæ of the two species are very difficult to distinguish. The chief point of distinction, however, lies, according to Buckler, in the fact that in *A. exclamationis* the black spiracles are always larger than the spots before and behind them; while upon each of the first five segments there is a pear-shaped blotch which is rather darker than the body-colour. Again, if carefully examined, it will be seen that the larvæ of *A. exclamationis* are darker than those of the other species.

Less destructive than the two species already noted are *A. suffusa* (*A. ypsilon*) and *A. nigricans.* In America the former is a great pest in certain seasons, the Cabbage and Tomato crops being the chief sufferers. Here it chiefly lives upon such coarse weeds as Plaintain, Cow Parsley, and the like; but like its congener already named it is not very fastidious in its tastes. In wing expanse it is about 1½in., blackish as to fore-wings, relieved by a slight tinge of red, with blackish spots and dots; the hind-wings are greyish-white. The larva is brown, with a paler stripe at the sides; it feeds from April to June, the perfect insect appearing in July and August. *A. suffusa* is a slightly larger insect, having brown and yellowish fore-wings, with black outlined spots and other black markings; the hind-wings are greyish. The larva is yellowish-brown, with light greenish sides, and feeds from May to July.

Turnips, swedes, and mangels are often badly attacked; and, less often, celery, potatoes, carrots, beet, cabbage, radishes, and lettuce; while the roots of corn and grass are

Agrotis—*continued.*

also laid under contribution by these pests. Auriculas, Polyanthuses, Asters, and herbaceous plants generally are frequently quite spoilt by the caterpillars, though the insects actually responsible for the mischief seldom get the credit.

Soot which has not been exposed has been found of great benefit for dusting round infested plants. Kainit has also been successfully employed. The object of the cultivator should be to get the plants to grow quickly; and this may be done by the judicious employment of artificial manures suitable to the particular crop. Nitrate of soda is most useful in the case of mangels. The hoe should be frequently employed, as this stirring of the soil exposes the larvæ (which, as a rule, feed some 2in. or 3in. beneath the soil) or their pupæ to the eyes of insectivorous birds, some of the most useful of which are the much-abused rook and its relative the starling, partridges, and plovers. In the case of gardens the use of an illuminated Moth trap (as employed by collectors) might be tried with success on summer evenings, as the Moths are readily attracted by light. If this trap were set early in the summer, doubtless many females would be captured before they had a chance of depositing their eggs. A powerful lamp, such as an electric or acetylene, would be equally useful. The time at which each species is found upon the wing would have to be taken into account, as *A. segetum* and *A. exclamationis* are earlier Moths than the other two mentioned. See also **Surface Caterpillars** and **Turnip Fly.** The Moths are seldom seen in the daytime, as they are so well protected by their colouring.

AGYLOPHORA. A synonym of **Uncaria** (which *see*).

AILANTHUS [not *Ailantus*]. Four species of somewhat fœtid, tall trees, natives of India, China, and Australia, are included in this genus. Flowers small, polygamous, on bracteolate pedicels; calyx short, five-lobed; petals five, spreading; disk ten-lobed, panicles terminal, branched. Samaræ rather large. Leaves alternate, imparipinnate; leaflets alternate.

A. erythrocarpa (red-fruited). A form of *A. glandulosa*, with fruits more brightly coloured than usual.
A. flavescens (yellowish). A synonym of *Cedrela sinensis.*

AIPHANES. A synonym of **Martinezia** (which *see*).

AIRA. Syn. *Fussia.* Four or five species, all European, are included in this genus. To those described on p. 44, Vol. I., the following should be added. Several plants formerly placed hereunder are now referred to **Deschampsia** (which *see*).

A. capillaris (thread-like). This plant possesses all the general characters of *A. pulchella*, but is of larger proportions, attaining a height of 1½ft. under cultivation; the branches of the panicle being long, irregular, and divaricate. It is very useful in the making-up of bouquets. Provence, &c. Syns. *A. provincialis* (R. H. 1892, f. 21), *Agrostis algeriensis* (of gardens).
A. provincialis (Provence). A synonym of *A. capillaris.*

AIZOON. Ord. *Ficoideæ.* This genus embraces about eight species, natives of South Europe, North and South Africa, Arabia, Australia, &c.

A. canariensis. A synonym of *Sesuvium Portulacastrum.*

AJUGA. Including *Chamæpithys.* The species of this genus number about thirty, and are distributed over extra-tropical regions. To those described on p. 45, Vol. I., the following varieties should be added:

A. reptans variegata (variegated). *l.* glaucous-green, with a broad, white edging. There are also purple-leaved and white-flowered forms of this species.

AKEBIA. Tribe *Lardizabaleæ* of Ord. *Berberideæ.* Four species of climbing shrubs, natives of China and Japan, are referred to this genus. Flowers violet, monœcious, in axillary, few-flowered racemes; sepals three, somewhat valvate; petals wanting. Leaves digitately

Akebia—*continued.*

three- to five-foliolate. To the species described on p. 45, Vol. I., the following should be added:

A. lobata (lobed). *fl.* pale purple, in a nodding or pendulous raceme; males numerous, ¼in. across; females few, below the males, ¼in. to 1in. across. January. *l.* long-petiolate, trifoliolate, 3in. to 5in. long; leaflets petiolulate, 1in. to 2in. long, broadly ovate, repand-lobulate. China and Japan, 1895. A tall, climbing shrub. (B. M. 7485.)

ALA (*pl.* Alæ). A wing.

ALANGIUM. ORD. *Cornaceæ.* This genus embraces eight or ten species, natives of tropical Asia and Africa.

ALARÇONIA. A synonym of **Wyethia** (which *see*).

ALATERNUS. *See* **Rhamnus Alaternus.**

ALBERTA (named in honour of Albertus Magnus, of the house of Bolstadt, a famous philosopher and theologian of the thirteenth century, who wrote a treatise in seven books entitled "De Vegetabilibus et Plantis"). ORD. *Rubiaceæ.* A small genus (two species) of ornamental, stove or greenhouse shrubs or small trees, one native of Madagascar and the other of Natal. Flowers small or rather large, in terminal panicles; calyx often coloured when fruiting, ten-ribbed, five-lobed; corolla tubular, elongated; stamens five. Fruit small, dry, two-celled. Leaves opposite, sub-sessile or petiolate. For culture of the only species introduced, *see* **Vangueria.**

A. magna (large). *fl.*, corolla reddish-purple, silky-pubescent, 1in. long, the segments obliquely ovate, acute. January and February. *fr.* oval, ¼in. long; calyx lobes scarlet, nearly 1in. long. *l.* shortly petiolate, oblong or elliptic-oblong, 4in. to 5in. long, 1½in. to 2in. broad, flat, with recurved margins. Young branches reddish-brown. Natal, 1891. (B. M. 7454.)

ALBIKIA. A synonym of **Hypolytrum** (which *see*).

ALBINA. A synonym of **Alpinia** (which *see*).

ALBIZZIA. This genus embraces about two dozen species, natives of the warmer regions of Asia, Africa, and Australia. Flowers generally five-parted, hermaphrodite or rarely polygamous; stamens white, pink, or (rarely) purple, elongated, usually numerous; peduncles axillary or paniculate at the tips of the branches, bearing globose heads or cylindrical spikes. Pods broadly linear, straight, flat-compressed, slender. Leaves bipinnate; leaflets small and many pairs or ample and few.

A. Lebbek (Lebbek). The correct name of *Acacia Lebbek.*

ALBUCA. About thirty species are known, all natives of South and tropical Africa. To those described on p. 45, Vol. I., the following should be added. They are Cape plants, and require greenhouse treatment except where otherwise stated. *See also* **Urginea.**

A. Allenæ (Mrs. Allen's). *fl.* greenish-white, about ¾in. long, disposed in a lax raceme. *l.* about six, lanceolate, flaccid, glabrous, 1ft. to 1½ft. long, 1½in. to 2in. broad. Stem 3ft. to 4ft. high. Bulb globose, 2in. or more in diameter. Zanzibar, 1887. A stove species, allied to *A. Wakefieldii.*

A. Buchanani (Buchanan's). *fl.* yellow, racemose, borne on a long, thin scape. *l.* linear. Bulb small, ovoid. Nyassaland, 1891. A stove species, nearly allied to *A. Wakefieldii.*

A. corymbosa (corymbose-flowered). *fl.* five or six in a lax corymb; perianth yellow, banded green, the inner segments hooded, connivent; outer stamens having no anthers; peduncle 6in. long. July. *l.* six to eight, terete, 1ft. or more in length. 1895.

A. fibrosa (fibrous). *fl.* three or four in a lax raceme; perianth pale yellow, broadly keeled with green, less than 1in. long; peduncle flexuous, glaucous, 1ft. long. August. *l.* two, terete, bright green, glabrous, 1ft. or more in length, ¼in. in diameter at base. Bulb small, the outer tunics clothed with persistent bristles, 1½in. to 2in. long. 1874.

A. Gardeni (Garden's). A synonym of *Speirantha convallarioides.*

A. glandulosa (glandular). *fl.* very fragrant, permanently erect; perianth white, banded with green, ¾in. long; raceme corymbose, three-flowered; peduncle 1ft. long, densely glandular. April. *l.* two or three, 6in. long, linear at base, ¼in. to ½in. broad, rounded at back. Bulb globose, 1in. in diameter. 1875.

A. juncifolia (Rush-leaved). *fl.* greenish-yellow, inodorous, drooping, ten to fifteen in a deltoid panicle 4in. to 5in. long; perianth 1in. long. August. *l.* twenty to thirty, sub-terete, 1ft. long, ¼in. to ½in. in diameter, tapering to a point. 1876. (B. M. 6395.)

Albuca—*continued.*

A. polyphylla (many-leaved). *fl.* few in a corymbose raceme; perianth white, banded with green, permanently erect; peduncle terete, 6in. long. March. *l.* twelve to fifteen, subulate, bright green, glabrous, 2in. to 3in. long, half a line broad. Bulb ovoid, 1½in. to 2in. in diameter. 1874.

A. trichophylla (hair-leaved). *fl.* few, arranged in a lax raceme 6in. long; perianth bright yellow, ¾in. long; peduncle as long as the leaves. *l.* seven or eight, erect, sub-terete, 9in. to 10in. long, ⅛in. in diameter, deeply channelled down the face. Bulb ¾in. in diameter. 1889.

A. Wakefieldii (Wakefield's). *fl.* pale green, ten to twelve in a lax raceme 6in. to 9in. long; perianth 1in. long, the inner segments bordered white; scape longer than the leaves. Autumn. *l.* four or five, linear-ensiform, flaccid, glabrous, 1ft. to 1½ft. long, 1in. broad at base, tapering to a point. Eastern tropical Africa, 1878. Stove. (B. M. 6429.)

ALCHORNEA (commemorative of Stanesby Alchorne, Assay-master in the Mint, who died in 1799 or 1800). Including *Cœlebogyne.* ORD. *Euphorbiaceæ.* A genus comprising about thirty species of stove or greenhouse trees or shrubs, inhabiting the warmer regions. Flowers diœcious or rarely monœcious, apetalous, in axillary or lateral spikes. Leaves alternate, entire or toothed. Only one species, *A. ilicifolia*, calls for mention here, and that not for any particular horticultural merit, but on account of the curious fact of its having reproduced itself from seed in European gardens (including Kew) through several generations from female plants alone, without the intervention of any male flowers.

ALECTOROLOPHUS. A synonym of **Rhinanthus** (which *see*).

ALEGRIA. A synonym of **Luhea** (which *see*).

ALETRIS. SYN. *Stachyopogon.* About eight species are included in this genus; they are found in North America, Japan, China, India, and Borneo.

ALEURITOPTERIS. *See* **Cheilanthes.**

ALEURODES, also called **ALEYRODES.** ORD. *Hemiptera.* A genus of very minute insects (about ¼in.) allied to the Aphides and the Scales. From the former, however, they differ in having broad powdery wings, as well as in their life-cycle; and from the latter in being four-winged in both sexes. The head is minute, and the eyes are divided. The antennæ, contrary to the general belief, are seven-jointed, though the articulations are not readily recognised. Signoret is one of the few naturalists who credit the insect with having seven-joints to the antennæ; the majority, and among them Bouché and Westwood, give but six. Signoret's description is as follows: 1, short, globose; 2, twice as long, clavate; 3, two and a-half times as long as 2, nearly as long as the last four, undulated, very small at its base, afterwards thicker; 4 and 7, of equal length, and shortest; 5 and 6, of equal length, and a little longer than 4 and 7; 5, globose at the extremity; the last five circularly striate. The wings are, as before stated, four in number, oval in shape, and when at rest are disposed nearly horizontally. The legs are short, simple, two-jointed; the tarsi are two-jointed and provided with two hooks. The larva is short, oval, flat, and generally scale-like in appearance. The pupa is fixed, and enveloped in the skin of the larva. There is, however, little to distinguish the one from the other generically. There are about twenty-five species, and all are extremely prolific.

The most noteworthy species is *A. proletella* (*A. chelidonii*) which infests a number of subjects, including such dissimilar ones as the Oak and the Cabbage. It is, however, in connection with the latter that the insect has chiefly been noticed in gardens. Mr. J. W. Douglas a few years ago described a new species, *A. ribium*, which he found on both Red and Black Currants. Fortunately this has not occurred in sufficient numbers to be regarded as pests. See also **Cabbage Powdered Wing** and **Snowy Fly.**

ALFONSIA. A synonym of **Elæis** (which *see*).

ALGA. A synonym of **Zostera** (which *see*).

ALIBERTIA. SYN. *Cordiera.* About a score species of trees and shrubs, restricted to tropical America, are included in this genus.

ALIBERTIA INTERMEDIA. A synonym of **Agave Alibertii** (which *see*).

ALIBREXIA. A synonym of **Dolia** (which *see*).

ALIPSA. A synonym of **Liparis** (which *see*).

ALISANDERS. *See* **Smyrnium.**

ALISMA NATANS. The correct name is *Elisma natans.*

ALKANNA (an Arabic name). SYNS. *Baphorhiza, Camptocarpus.* ORD. *Boragineæ.* A genus embracing nearly forty species of hispid or glutinous, mostly hardy, perennial herbs, natives of South Europe, North Africa, and Western Asia. Flowers yellow, blue, violet, or white, in simple racemes or cymes; calyx five-parted; corolla tube cylindrical, the five lobes imbricated. Leaves alternate. Roots often tinged with red. Only two species call for mention here. For culture, *see* **Lithospermum.**

A. orientalis (Eastern). *fl.* yellow; corolla tube twice as long as the calyx. June. *l.*, radical ones attenuated at base; cauline ones very narrow, decurrent; floral ones somewhat cordate-ovate at base. Stem ascending. Levant, 1813. SYN. *Lithospermum orientale* (B. M. 515).

A. tinctoria (dyers'). The correct name of *Anchusa tinctoria.* SYN. *Lithospermum tinctorium* (A. B. R. 576).

ALKEKENGI. *See* **Physalis Alkekengi.**

ALLAGOPTERA. A synonym of **Diplothemium** (which *see*).

ALLAMANDA. SYN. *Orelia.* A dozen species have been referred to this genus, but the rank of some of them is very uncertain; they inhabit South America, one extending as far as Central America. To those described on pp. 47-8, Vol. I., the following should be added:

A. Blanchetii (Blanchet's). A synonym of *A. violacea.*

A. cathartica Hendersoni (Henderson's). *fl.* orange-yellow, with five white spots at the throat, tinged brown outside, the lobes finely formed, immensely thick and wax-like. (R. G. 1887, pp. 560-1, f. 142.) SYNS. *A. Hendersoni* (F. M. 1866, 263; I. H. 1865, 452), *A. Wardleyana.*

A. c. Williamsii (Williams's). This form differs from the others in being of erect habit. 1891. (J. H. 1891, xxiii., f. 14, and Gn. xl., t. 832, under name of *A. Williamsii.*)

A. Hendersoni (Henderson's). A variety of *A. cathartica.*

A. magnifica (magnificent). A variety of *A. Schottii.*

A. Schottii magnifica (magnificent). *fl.* clear yellow, with a deep orange-yellow throat, about 5in. in diameter, freely produced in clusters. 1888.

A. violacea (violet). *fl.* rosy-purple, large, axillary and in few-flowered, tomentose cymes. October. *l.* three to five in whorls, sessile, oblong or obovate-oblong, cuspidate-acuminate, puberulous above, tomentose beneath. Branches pubescent-tomentose. Brazil, 1839. Plant erect or climbing. (B. M. 7122.) SYN. *A. Blanchetii.*

A. Wardleyana (Wardley's). A synonym of *A. cathartica Hendersoni.*

A. Williamsii (Williams's). A variety of *A. cathartica.*

ALLANTODIA. Like the strong-growing Asplениums, the Allantodia requires a substantial yet light soil, in which its fleshy roots delight to run: a mixture of equal parts fibrous peat, leaf mould, turfy loam, and silver sand, suits it best. The plant has a great objection to being potted hard, and to imperfect drainage. If there is stagnation of water about the roots the foliage soon becomes flabby and begins to show unmistakable signs of ill-health. The Allantodia is also averse to strong light, and to preserve the bright green colour peculiar to its fronds it is necessary to protect them from the strong rays of the sun. The waterings must be copious during the summer, and gradually lessened, until in winter the roots are kept only sufficiently moist to prevent the plant from shrivelling. The propagation of this species is effected exclusively from spores, which are produced in abundance and germinate freely.

A. australis. A synonym of *Asplenium umbrosum.*

ALL-HEAL. *See also* **Valeriana officinalis.**

ALLIONIA (named in compliment to C. Allioni, an Italian botanist). SYN. *Wedelia* (of Linnæus). ORD. *Nyctagineæ.* A monotypic genus. The species, *A. involucrata,* is a prostrate, dichotomously branched, American annual, allied to *Mirabilis,* with small, purple flowers, and opposite, entire leaves. It has no particular horticultural value.

ALLIONIA (of Loefler). A synonym of **Oxybaphus** (which *see*).

ALLIUM. Including *Nectaroscordum* and *Ophioscorodon.* This genus embraces about 250 species, mostly inhabiting Europe, North Africa, Abyssinia, and extra-tropical Asia, but many are found in North America and Mexico. Our garden Leek (*A. Porrum*) is a cultivated form of *A. Ampeloprasum;* Chives, of *A. Schœnoprasum;* and Rocambole, of *A. Scorodoprasum,* all of which are British plants.

A. neapolitanum, the well-known South European species, may be employed as a pot plant, and is useful for forcing. The bulbs should be potted up in autumn, using well-drained pots and a sandy soil. They should then be stood in a bed of ashes outside and covered with cocoa-fibre. When well-rooted, and top growth is evident, they should be transferred to a cold frame, and shaded for a few days, after which they may be stood in the greenhouse. *A. neapolitanum* is one of the flowers which is sent into this country in vast quantities in early spring, and is commonly, but erroneously, called Star of Bethlehem.

To the species described on pp. 48-9, Vol. I., the following should be added:

A. Akaka (Akaka). *fl.* rose-coloured, ¼in. long; umbel dense, many-flowered, convex. Spring. *l.* usually in pairs, flat, ovate or ovate-oblong, ¾in. to 1¼in. broad, obtuse or with a short point at apex. Stem very short. Bulb ovate. North Persia, 1894. Allied to *A. karataviense.*

A. album (white). A synonym of *A. neapolitanum.*

A. Alexianum (Alexis'). *fl.* whitish, striped with brownish-purple; umbel many-flowered, somewhat fastigiate, convex. *l.* two, three, or more, elliptic-oblong or oblong-lanceolate, 1in. to 2in. broad, the inner ones often narrower, glabrous. Bulb sub-globose. Turkestan, 1889.

A. amblyophyllum (obtuse-leaved). *fl.* lilac; perianth segments lanceolate, acute; umbel about 1½in. in diameter, globose. Summer. *l.* five or six, broad, linear, obtuse, flat, spaced along the stem. Bulb small. Turkestan, 1885. A rather distinct species, of dwarf habit. (R. G. 1190.)

A. anceps (two-edged). *fl.* purple or greenish-white, ¼in. long; umbel very many-flowered, fastigiate. May. *l.* broadly linear, attenuated at both ends, falcate or more or less curved. Stems erect, ancipitous, shorter than the leaves. Bulb ovate. North-west America, 1875. (B. M. 6227.)

A. Backhousianum (Backhouse's). *fl.* white, in a dense, globose head; perianth segments narrow-linear and totally reflexed; stamens united into a cup at the base. *l.* radical, bluish-white. *h.* 3ft. to 4ft. Himalayas, 1885. A tall species, resembling *A. giganteum.* (R. G. 1885, 215.)

A. cabulicum (Kabul). *fl.* whitish, with keels of reddish-brown; umbel dense, globose, many-flowered, about 2in. in diameter. *l.* single, lorate-oblong, glabrous, 6in. to 8in. long, 2in. broad, gradually narrowed to the clasping base. Kabul, 1893. (B. M. 7294.)

A. ciliatum (ciliated). A synonym of *A. subhirsutum.*

A. cyaneum (blue). *fl.* very numerous, in a hemispherical or sub-globose umbel; perianth blue, campanulate. *l.* narrow-linear or filiform, channelled above. Stems erect or slightly nodding at apex, 6in. to 12in. high. Bulbs tufted, elongated. Kansu, China, 1890. (R. G. 1316.)

A. c. brachystemon (short-stamened). A synonym of *A. kansuense.*

A. clatum (tall). *fl.* purple, numerous, disposed in a large, globose head; perianth segments spreading, oblong, obtuse; scape stout, 3ft. or more high. *l.* oblong, obtuse, 8in. to 12in. long, 2in. to 4in. broad. Central Asia, 1887. (R. G. 1251.)

A. Fetisowi (Fetisow's). *fl.* of a rosy-lilac; umbel many-flowered, at first hemispherical, at length sub-globose. *l.* oblong- or linear-lanceolate, flat, 10in. to 16in. long. Stems erect, 2ft. high, terete, smooth, with one or two leaves at the base. Turkestan, 1879.

A. fragrans (fragrant). A synonym of *Nothoscordum fragrans.*

A. giganteum (gigantic). *fl.* numerous, forming a dense globose umbel 4in. in diameter; perianth bright lilac, ¾in. long, the segments widely spreading; peduncle erect, 3ft. to 4ft.

Allium—*continued.*

long. June. *l.* six to nine, springing from the base of the peduncle, lorate, flaccid, glaucescent, 1½ft. long, 2in. broad in the middle. Bulb globose, 2in. to 3in. in diameter. Merv, 1883. (B. M. 6823; R. G. 1113.)

A. Holtzeri (Holtzer's). *fl.* many, in a capitate, hemispherical umbel 1½in. in diameter; perianth white, the segments elliptic-oblong, acute, with a green middle nerve; anthers red; ovary green, prominent; scape flexuous, 5in. to 7in. long. *l.* filiform, more or less terete, equalling or exceeding the scape, glabrous. Bulbs fascicled-tufted, oblong-cylindrical. Turkestan, 1884. (R. G. 1169, a-c.)

A. kansuense (Kansu).* *fl.* blue, with the stamens shorter than the perianth segments; umbel hemispherical, many-flowered. *l.* linear, channelled in the lower part, having the margins rough. Stem leafy to near the middle. Bulbs slender, cylindric, tufted. Kansu, China, 1889. (R. G. 1870, 1317.) SYN. *A. cyaneum brachystemon.*

A. lacteum (milky). A synonym of *A. neapolitanum.*

A. Macleanii (Maclean's). *fl.* in a dense, globose umbel 3in. to 4in. in diameter; perianth mauve-purple, ¾in. long, the segments oblong-lanceolate, acute; spathe valves two, membranous; peduncle flexuous, 2ft. to 3ft. long. Summer. *l.* four or five, evanescent, lanceolate, about 1ft. long, 1in. to 1½in. broad, glabrous. Kabul, 1882. (B. M. 6707.)

A. macranthum (large-flowered). *fl.* fifty or more in a loose, globose umbel 3in. to 4in. in diameter; perianth bright mauve-purple, nearly ¾in. long, permanently campanulate; pedicels 1½in. to 2in. long; scapes several in a tuft, 2ft. to 3ft. long. July. *l.* numerous, linear, thin, 1ft. to 1½ft. long, tapering gradually to a long point. Rootstock indistinctly bulbous, with a dense tuft of fleshy root-fibres. Eastern Himalayas, 1883. (B. M. 6789.)

A. narcissiflorum (Narcissus-flowered).* *fl.* of a beautiful rose-colour, campanulate, ¾in. long; umbel at first nodding, then erect, few-flowered, fastigiate or almost hemispherical. *l.* linear. Stems erect, terete, striated, 4in. to 15in. high. Bulbs tufted. Italy, &c., 1875. (B. M. 6182.)

A. oreophilum (mountain-loving). *fl.* reddish-purple, nearly ¼in. long; umbel very many- (or rarely few-) flowered. *l.* linear, broadly linear, or narrowly linear-lanceolate, channelled above, convex beneath. Stems 1½in. to 4in. above the ground. Bulb sub-globose, white-skinned. Caucasus, Siberia, &c. (R. G. 1873, t. 775, f. 1-3.)

A. orientale (Oriental). *fl.* white, with greenish or reddish nerves; umbel many-flowered, almost hemispherical. *l.* linear-lanceolate, ¼in. to ¾in. broad, very flexuous or undulated, attenuated-acute. Stems erect, 4in. to 8in. high, with one or two leaves at base. Bulb large, roundish-ovate, white-skinned. Syria.

A. o. rubellum (reddish). *fl.* bright rose-coloured. *l.* small, glaucous. 1889.

A. Ostrowskianum (Ostrowsky's).* *fl.* rose-coloured, disposed in a many-flowered umbel; scape 8in. to 12in. high. *l.* two or three, linear, flat, flaccid, acute, glaucous. Turkestan, 1883. (R. G. 1089.)

A. oviflorum (ovate-flowered). *fl.* deep violet-purple, ovate-conical, nodding; sepals connivent; umbel lax, roundish; scape acutely four- to six-angled. *l.* produced at the apex of the short, bulbless stems, sub-biseriate, lax, keeled, glabrous. Chumbi Valley, India, 1883. A pretty and interesting plant. (R. G. 1134.)

A. parciflorum (scanty-flowered). *fl.* purple, small, three to six in an umbel. *l.* two to four, slender, filiform, placed at from one-third to half-way up the stems. Stems one to three, slender, 4in. to 10in. high. Bulb ovoid. Corsica and Sardinia, 1838. SYN. *A. pauciflorum.*

A. pauciflorum (few-flowered). A synonym of *A. parciflorum.*

A. Przewalskianum (Przewalski's). *fl.* rosy-lilac; umbel many-flowered, hemispherical or fascicled. *l.* semi-terete-filiform. Stems terete, slender, 6in. to 10in. high, leafy below. Bulbs tufted, conico-cylindrical. Kansu, China, 1889.

A. pulchellum (rather pretty). *fl.* violet; perianth obconical-campanulate; filaments one-and-a-half times longer than the perianth; umbels many-flowered; scape tall, terete, leafy to the middle. *l.* narrow-linear, channelled above, striated beneath, equalling the scape. Orient.

A. Schuberti (Schubert's).* *fl.*, perianth rose-red, the segments connate at base, lanceolate, acute, twice exceeding the stamens; umbel very large (sometimes 1ft. in diameter when bearing seed), sub-globose, containing fifty to 200 flowers; scape terete, thick, about 1ft. high. *l.* broadly lorate-lanceolate, flat, more or less undulated. Bulb ovate, thick. Orient, 1898. (B. M. 7587-8.)

A. Semenovi (Semenow's). *fl.* yellow, on very short pedicels; outer perianth segments longer than the inner ones; stamens very short, united in a tube round the ovary; umbel small, dense; scape usually shorter than the leaves. *l.* glaucous, fistular, flat on the face, rounded at back. Alatau Mountains, 1884. (R. G. 1156.)

A. semiretschenskianum (name not explained). *fl* flesh coloured, 1½in. long; umbel many-flowered, hemispherical. *l.* linear, channelled above, convex beneath. Stems erect, terete, 1½ft. high. Bulb tunics entire. Wernoe, 1879.

Allium—*continued.*

A. Sprengeri (Sprenger's). *fl.* yellowish, many in an umbel. *l.* flat, linear. Bulbs ovoid, crowded on a short rhizome. Jaffa, Syria. 1889.

A. stipitatum (stalked). *fl.* rosy-lilac, odorous; umbel hemispherical or sub-globose, bractless. *l.* all radical, narrow-linear-lanceolate, slightly hairy on the margins, glabrous above. Stem 2½ft. to 3ft. high. Bokhara, 1881.

A. subhirsutum (somewhat hairy). *fl.* white, or with the middle nerve more or less purplish; umbel few- or many-flowered, convex. July. *l.* broadly linear, more or less villous or hairy, attenuated-acute towards the apex. Stems erect, 4in. to 12in. high. Bulb ovate-globose. South Europe. (L. B. C. 943.) SYN. *A ciliatum* (B. M. 774).

A. Suworowi (Suworow's). *fl.*, perianth dark mauve-purple, ¼in. long, the segments keeled with green; umbel very dense, globose, 2in. to 3in. in diameter; scape stout, erect, 2ft. long. May and summer. *l.* six or seven in a basal rosette, ensiform, 1ft. to 1½ft. long, 1in. broad, glaucous-green, flaccid. Central Asia. (B. M. 6994.)

ALLOMORPHIA (from *allos*, diverse, and *morphe*, form; application not obvious). ORD. *Melastomaceæ.* A small genus (two or three species) of stove, branched shrubs or under-shrubs, natives of the Malayan Peninsula and islands. Flowers small, whorled, in terminal or almost radical panicles; calyx obtusely four- or five-toothed, persistent; petals four or five, acute, small; stamens eight or ten, almost equal. Leaves long-stalked, ample, ovate, ovate-oblong, or orbicular, entire or slightly toothed. Only one species has been introduced. For culture, *see* **Melastoma.**

A. Griffithii (Griffith's). *fl.* white, numerous, spreading; panicle elongated, narrow; scape red, erect, 8in. long. June. *l.* ample, orbicular, deeply cordate, leathery, glandular-toothed, seven- to nine-ribbed, bronzy green above, reddish beneath. Malayan Peninsula, 1893. (B. M. 7324.)

ALLOPHYLLUS. A synonym of **Schmidelia** (which *see*).

ALLOPLECTUS. SYNS. *Crantzia* (of Scopoli) *Lophia.* Including *Heintzia* and *Macrochlamys.* About thirty species have been referred to this genus, all natives of tropical America, from Brazil to the West Indies and Central America. To those described on p. 49, Vol. I., the following should be added:

A. concolor (one-coloured). A form of *A. dichrous*, with red flowers. Brazil, 1846. (B. M. 4371.)

A. Lynchei (Lynch's). *fl.* yellow, hairy, in axillary clusters, the large calyces tinged with red. July. *l.* oblong-lanceolate, acuminate, unequally crenate-serrate, green above with a red midrib and veins, sanguineous-purple beneath, thickened into a short petiole. Stem robust. Colombia (?), 1890. (B. M. 7271.)

A. Schlimii (Schlim's). *fl.*, calyx cinnabar, spotted with green, large; corolla scarlet or yellowish in the lower part, of a beautiful violet above, urceolate, nearly regular; pedicels, axillary, twin or few. *l.* oblong, acuminate, rounded or almost cordate at base, dark green above, purplish-violet beneath. Colombia, 1851. (F. d. S. 827.)

A. tigrinus (tiger-marked). *fl.* erect or nearly so; calyx yellowish-green, tinged with red; corolla white, funnel-shaped, half as long again as the calyx, the lobes spotted with purple. Midwinter. *l.* large, opposite, fleshy, ovate, acuminate, hoary and pale beneath, strongly veined. *h.* 2ft. to 5ft. Caracas, 1852. SYN. *Heintzia tigrina.* (B. M. 4774.)

ALLOTMENTS. These are readily procured in any district where the demand for such exists, as they are now regulated by Acts of Parliament—the Allotments Act of 1887, the Allotments Act of 1890, and the Local Government Act of 1894—the duty of making enquiries into such demands for allotments being delegated to the sanitary authority. Parish councils also have power to hire land for allotment purposes, and if they are satisfied that allotments are required, and are unable to hire by agreement land suitable for the purpose, they may make representations to the County Council. That body is still further empowered, and may make an order authorising the Parish Council to hire compulsorily such land as they specify. The period over which such hiring extends must not be less than fourteen years, nor more than thirty-five years. It is also provided that the Parish Council

Allotments—*continued.*

may let to one person an allotment or allotments exeeeding one acre; but in the case of compulsorily hired land it must not exceed four acres of pasture or an acre of arable and three acres of pasture. By the Allotments Compensation Act holders are, moreover, compensated for growing crops, labour, and manure expended in anticipation of a crop; and where the previous consent of the landlord has been obtained for fruit-trees, bushes, drainage, and such buildings as are allowed to be erected. This Act applies alike to cottage gardens and to holdings under two acres cultivated as a garden or as a farm, or partly as a garden or as a farm. Another point for which provision is made is to relieve holders of allotments from being assessed for sanitary purposes at a higher rate than other lands under cultivation. At one time England only was included in the Act, but now Scotland also participates.

ALMEIDIA. SYN. *Aruba.* About ten species are known, all natives of Brazil.

ALNUS. Including *Clethropsis.* About fourteen species, broadly dispersed over Europe, Central and North Asia, North America, and the Andes of South America, are here included. The only British species is *A. glutinosa.*

The gold and silver-leaved varieties may be increased by grafting in the open air in March on stocks of the common species *(Alnus glutinosa),* which should have been inserted the previous spring, as the plants should be firmly established before the scions are put on. The latter should be of well-ripened wood and about 4in. in length.

To the species, &c., described on p. 50, Vol. I., the following should be added:

A. acuminata (taper-pointed). *barren catkins* cylindrical, sessile or pedicellate, often racemose and terminal, rarely axillary. *fertile catkins* ovate-oblong, racemose, usually axillary. *l.* ovate or roundish-ovate, usually acuminate, rarely acute, rounded at base, irregularly or doubly toothed. Mountains of tropical America, &c.

A. a. Mirbelii (Mirbel's). *l.* unequally toothed, glaucous beneath, the nerves and veins pale ferruginous-pubescent. Peru, &c.

A. cordata (cordate). A synonym of *A. cordifolia.*

A. glutinosa acutifolia (acute-leaved). *l.* obovate or oblong, almost acuminate at apex, wedge-shaped at base. SYN. *A. oblongata.*

A. incana hirsuta (hairy). *l.* almost orbicular, obtuse, downy on both surfaces.

A. i. pendula nova (pendulous, new). An elegant, weeping variety, adapted for moist places.

A. i. pinnatifida (pinnately cleft). *l.* pinnatifid.

A. i. sibirica (Siberian). *l.* elliptic-orbicular, glabrescent, heart-shaped at base, rounded at the apex.

A. japonica (Japanese). *catkins* ellipsoid, obtuse, ½in. to ¾in. long, nearly or quite ¼in. thick. *l.* elliptic or elliptic-ovate, acuminate, serrated, acute at base, 2in. to 4in. long, 1in. to 2in. broad. Japan, 1836. Tree. (G. & F. 1893, p. 345, f. 53.)

A. Mirbelii (Mirbel's). A variety of *A. acuminata.*

A. nepalensis (Nepaul). *barren catkins* 4in. to 10in. long, in terminal, drooping panicles. *fertile catkins* ½in. long, pendulous in flower. *fr.*, spikes in lateral, erect panicles. *l.* elliptic-lanceolate, acute, entire or nearly so, 3in. to 7in. long, 2in. to 4in. broad, slightly glaucous beneath; petioles ½in. to 2in. long. Temperate Himalayas. SYN. *Clethropsis nepalensis.*

A. nitida (shining).* *fl.* appearing after the leaves; barren catkins 2in. long, in terminal, erect racemes; fertile catkins 1in. to 2in. long. *fr.*, spikes solitary or in erect racemes. *l.* elliptic-ovate or elliptic-acuminate, 4in. to 8in. long, sometimes 3½in. broad, obscurely crenate or entire, cuneate or rarely rounded at base. Branchlets pubescent. Trunk sometimes 15ft. in girth. *h.* 100ft. Temperate Himalayas. (B. M. 7654.)

A. oblongata (oblong). A synonym of *A. glutinosa acutifolia.*

A. oregana (Oregon). A form of *A. rubra.*

A. orientalis (Eastern). *catkins,* young ones of both sexes glutinous, pedunculate. *l.* ovate-elliptic or ovate-oblong, rounded or rarely almost cordate at base, the margins simply or doubly crenate-toothed. Orient, &c.

A. pubescens (downy). A hybrid between *A. glutinosa* and *A. incana.*

A. rhombifolia (rhomb-leaved).* *l.* ovate or ovate-oblong, 2in. to 3in. long, obtuse or acute, cuneate at base, irregularly glandular-toothed, smooth above, slightly pubescent beneath.

Alnus—*continued.*

California, 1888. An ornamental tree, similar to *A. rubra,* but having slenderer branches, the dark brown bark scarcely dotted with white, and the nutlets with a thickened margin, not winged. (Sargent, Silva of N. America, p. 456—California, &c.)

A. rubra (red). *catkins* ovate-elliptic. *fr.*, nutlets winged. *l.* ovate-elliptic, obtusely lobulate or crenate, large, petiolate, acute or obtuse, glaucescent and prominently reddish on the nerves beneath, highly glabrous on both sides. *h.* 20ft. Vancouver Island, &c. *A. oregana* is a form of this species.

A. serrulata (slightly serrated). *barren catkins* elongated, drooping. *fertile catkins* ovoid, shortly pedunculate. January to March. *l.* obovate, obtuse or abruptly pointed, 2in. to 4in. long, thickish, usually pubescent beneath, acute at base, shortly petiolate; stipules oval, obtuse. *h.* 3ft. to 12ft. North America, 1769.

A. sibirica (Siberian), of Fischer. A form of *A. incana.*

A. sibirica, of gardens. A synonym of *A. glutinosa.*

A. virescens (greenish). A handsome Alder, allied to *A. incana.* Colorado, 1897.

ALOCASIA. In addition to the score of species, natives of tropical Asia, the Malayan Archipelago, &c., there is now a good selection of hybrid Alocasias. To those described on pp. 50-1, Vol. I., the following should be added:

A. æquiloba (equal-lobed). *fl.*, spathe shining green, the tube 1½in. long, the limb 2½in. long, oblong, acute, reflexed, with revolute margins; peduncle 9in. or more in length. *l.* hastate-sagittate, the terminal lobe 7in. to 12in. long, 3in. to 6in. broad, shortly cuspidate at apex, the basal lobes 6½in. to 12½in. long, 1½in. to 2½in. broad. German New Guinea, 1895. Plant glabrous.

A. albo-violacea (white and violet). A synonym of *Xanthosoma maculatum.*

A. argyræa (silvery). *l.* hastate-lanceolate, very large, dark green, with a silvery sheen, and having a prominent midrib. 1895.

A. argyroneura (silvery-nerved). A synonym of *Caladium Schomburgkii.*

A. Augustiana (Auguste Linden's). *l.* peltate, repand, green, the primary nerves paler, as is also the under-surface; petioles 1ft. to 1½ft. long, ¾in. to 1¼in. thick at base, terete, rosy, with brown hieroglyphic spots. 1886. (I. H. 1886, 593).

A. Chantrieri (Chantrier's).* *l.* about 1ft. long and 6in. broad, oblong-sagittate, peltate, with undulated margins, deep olive-green above, the veins narrowly bordered with silvery white; under-surface deep violet-red; petioles slightly dilated, with sheathing base, cylindrical, green, lightly barred with olive. A hybrid between *A. metallica* and *A. Sanderiana.* (I. H. xxxv. t. 64; R. H. 1887, p. 465.)

A. coriacea (leathery). *l.* dark green, with clear green ribs; petioles rose-coloured when young, then rosy-white, marbled with green. 1893.

A. Curtisii (Curtis's). *fl.*, spathe pale yellow, 6in. long; spadix yellow, as long as the spathe; peduncle 1ft. long. *l.* 1½ft. long, 1ft. broad, with long basal lobes, light and dark green above, purple on the lower surface; petioles about 2ft. long. Penang, 1894.

A. denudata (denuded). *fl.* on a long, slender peduncle. *l.* triangular-sagittate, shortly acuminate, about one-third as broad as long, the basal lobes nearly as long as the anticous, the costæ marginal. India and Singapore.

A. Dussii (Duss's). *l.* large, olive-green, with brownish-red nerves and petioles. 1893.

A. eminens (eminent). *fl.*, spathe tube light green, 1½in. long, the lamina greenish-white, veiny, 3½in. to 4in. long, reflexed; spadix light green and creamy-white, 3½in. to 4½in. long; peduncles in pairs (? always), 1ft. to 1½ft. long. *l.* peltate, ovate-sagittate, 20in. to 22in. long, 9in. to 10½in. broad, dark green above, the under-surface purple, with very pale midrib and primary veins; petioles 3½ft. to 4½ft. long, terete, 1in. thick at base, olive-green, with a coppery hue, and barred blackish-green. Malaya, 1887.

A. erythræa (red). A synonym of *Caladium Schomburgki Schmitzii.*

A. Gaulainii (Gaulain's). *l.* cordate, dark green above with a violet hue along the nerves, beneath light violet with blackish nerves. 1890. A robust plant.

A. gigas (gigantic). *l.* 5ft. high, of an intense green above, paler beneath, deeply cut; petioles pale green, mottled. 1897. A handsome plant, remarkable for its size.

A. grandis (large).* *fl.*, spathe white, marked with carmine lines on the outside, having a short, mottled green tube; peduncles about 10in. long. *l.* ovate-sagittate, 1¾ft. to 2ft. long, 1ft. broad, bright green above, blackish-green beneath; petioles blackish, 3ft. to 3½ft. long. East Indian Archipelago, 1886. A noble and ornamental plant.

A. guttata imperialis (imperial). *fl.*, spathe white, spotted red on the tube. *l.* elliptic-sagittate, acute, 1ft. to 1½ft. long,

Alocasia—*continued.*

¾ft. to 1¼ft. broad, dark green above with slightly paler spaces between the nerves, purplish beneath. Borneo, 1885. A fine foliage plant. (I. H. 1884, 541.)

A. indica (Indian). *fl.*, spathe pale yellow-green, 8in. to 12in. long; spadix as long. *l.* 2ft. to 3ft. long, ovate, deeply sagittate-cordate, repand, the tip a deflexed cusp, the basal lobes sometimes shortly connate; petioles stout, traversely clouded. Stem 8ft. high, 3in. to 8in. in diameter. Tropical Asia.

A. Johnstoni. The correct name is *Cyrtosperma Johnstoni.*

A. Lindeni (Auguste Linden's).* *l.* 8in. long, 4½in. to 6in. broad, glabrous, green above, with yellowish-white midrib and principal veins, paler beneath, cordate-ovate, very long-acuminate, the sinus large, triangular; petioles white or greenish-white, 10in. to 12in. long, ½in. to ¾in. thick, erect, terete, channelled, amplexicaul, with decurrent sheaths half their length. Malaya, 1886. (I. H. 1886, 603.)

FIG 35. ALOCASIA LOWII GRANDIS.

A. Lowii grandis (large). *l.* broader than in the type, of a deeper metallic brownish-green; veins greyish-green, showy. 1895. A fine variety. See Fig. 35.

A. Luciani (Lucien Linden's). *l.* peltate, ovate, cuspidate at apex, obcordate at base, dark green above, with pale cinereous veins and margins, purple beneath; basal lobes ovate-deltoid; petioles very long, thick, pale, dotted and spotted brown. 1887. A hybrid between *A. Thibautiana* and *A. Putzeysi.* (I. H. ser. v. 27.)

A. Margaritæ (Marguerite's). *l.* large, obcordate, peltate, repand, rather thick, bullate, highly glabrous above, except on the blackish midrib and primary veins; sinus triangular, the apex at the junction of the petiole; petioles terete, puberulous, brownish-purple, sheathing at base, the sheaths rosy-margined. Java, 1886. (I. H. 1886, 611.)

A. marginata (margined). *fl.*, spathe tube green, 1in. to 1½in. long, the lamina pale greenish-white, usually striped and spotted dull purple at back; spadix white, 6in. to 7in. long. *l.* 1½ft. to 2ft. long, 11in. to 14in. broad, broadly cordate-ovate, slightly sinuate-margined, rounded into a shortly-pointed apex; petioles 2ft. to 3½ft. long, with zigzag marks of blackish-brown, the sheaths broadly margined with blackish-brown. Brazil. 1887.

A. odora (odorous). The correct name of *Colocasia odorata.*

A. Portei. *See* **Schizocasia Portei.**

A. princeps (foremost). *l.* sagittate, the hinder lobes narrow and spreading, forming a triangular, open sinus, the margins deeply sinuate, the upper surface of a metallic olive-green, with darkened midribs and primary veins, the under-surface greyish-green, with dark chocolate-brown veins and margin; petioles slender, greyish-green, heavily marbled chocolate-brown. Malayan Archipelago, 1888.

A. Pucciana (Signor Pucci's). *l.* peltate, oval-sagittate, 1½ft. long, about 9in. broad, deep green above, the pure white veins surrounded by a silvery-white zone; under-surface glossy purplish; petioles fleshy, smooth, cylindrical, pale purplish, marked with wavy, irregular zones of dull crimson-red; in the upper portion these markings disappear. 1887. Garden hybrid.

A. Putzeysi (Putzeys').* *l.* similar in shape to those of *A. longiloba*, dark green, the midrib, primary and secondary veins, and margins bordered with white; under-surface dark purple. Sumatra, 1882. (I. H. 445.) SYN. *A Watsoniana* (G. C. 1893, xiii., p. 442, f. 83).

A. Regina (queen). *fl.*, spathe tube ovoid, 1in. long, 3in. to 4in. in diameter, ivory-white, spotted purple, the blade white,

Alocasia—*continued.*

2in. to 2½in. long, reflexed; spadix sessile, rather shorter than the spathe. *l.* ovate-cordate, repand, somewhat fleshy, glabrous above, except the pubescent midrib and veins, dull brownish-purple beneath; petioles terete, spotted fuscous-purple. Borneo, 1885. (I. H. 1885, 544.)

A. Regnieri. *See* **Schizocasia Regnieri.**

A. reversa (reversed). *l.* ovate-sagittate, greyish-green, the primary veins broadly bordered with dark green. *h.* less than 1ft. Philippine Islands, 1890. An attractive foliage plant. (B. M. 7498.)

A. Sanderiana (Sander's).* *l.* deflexed, glossy, arrow-shaped, with three lateral lobes on each side, peltately affixed, the midrib and borders ivory-white, the surface bright green, with metallic-blue reflections; petioles erect, brownish-green, striately mottled. Philippines, 1884.

A. S. gandavensis (Ghent). *l.*, young ones purplish, with vermilion-tinted veins, these colours remaining constant above, but changing to green beneath. 1896. (I. H. 1896, t. 65.)

A. S. nobilis (noble). *l.* large, dark metallic green, with bronzy-red reflections; midrib and prominent veins greenish-white, margined on either side with a band of greyish-rose. 1893.

A. singaporensis (Singapore). This mainly differs from *A. denudata* in having triangular-ovate-hastate leaves with divaricate lobes. *h.* 1½ft. Singapore.

A. sinuata (sinuate). *fl.*, spathe light green, 3in. long; spadix shorter than the spathe; peduncle as long as, or longer than, the petioles. *l.* sagittate, with sinuate margins; upper side of the young ones very dark green along the principal veins, with a lighter green between; older ones dark green above, the under-side whitish-green. Philippines, 1885.

A. Veitchii (Veitch's). A synonym of *A. Lowii.*

A. Villeneuvei (Comte de Villeneuve's). *l.*, blades very unequal; petioles wholly spotted with brown. Borneo, 1887. Closely allied to *A. longiloba.* (I. H. ser. v. 21.)

A. Watsoniana (Watson's). A synonym of *A. Putzeysii.*

A. intermedia, *A. Kerchovei*, and *A. Martin Cahuzac* are other forms in cultivation.

Other garden hybrids are: *conspicua*, *gibba*, *mortfontanensis*, *nobilis*, *Rex*, *Rodigasiana*, and *Uhinki.*

ALOË. Including *Bowiea* (of Haworth), *Pachidendron*, and *Rhipodendron.* The name *Aloë* is in common use for *Agave*, which belongs to a different natural order; there is a widespread, but totally erroneous, belief that the *Aloë* (meaning the *Agave*) flowers only once in 100 years. *See* **Agave.**

These succulents are largely employed for the decoration of the greenhouse, their foliage varying considerably, and being, in some cases, very ornamental. To the species described on pp. 51-3, Vol. I., the following should be added. Several plants formerly classed hereunder are now referred to **Haworthia.**

A. abyssinica. In addition to *Peacockii*, the following varieties exist in Continental gardens: *erecta* (erect), *glauca* (bluish-green), *maculata* (spotted), *pygmæa* (dwarf), *recurvata* (recurved), and *robusta* (stout).

A. aurantiaca (orange). *fl.* all deflexed; perianth bright yellow, tinged with red when young, 1½in. long; raceme very dense, 5in. to 6in. long, 2in. in diameter; peduncle as long as the leaves. *l.* lanceolate, 8in. to 9in. long, 1½in. broad, plain green, with small pale teeth. Stems sub-erect, several feet long, ¾in. thick. 1892.

A. brachystachys (short-spiked). *fl.* pink and yellow, tubular, tipped with green, 1½in. long, the lobes lingulate, shorter than the tube; raceme dense, simple, oblong, 6in. long; peduncle flexuous, about as long as the leaves. *l.* about twenty, crowded at the top of the stem, ensiform, 1½ft. to 2ft. long, ½in. thick; marginal prickles deltoid. Stem long, slender, erect, simple. Zanzibar, 1884. (B. M. 7399.)

A. Buchanani (Buchanan's). *fl.* pale reddish and greenish, 1in. long, on very long pedicels; raceme dense, few-flowered; scape simple, 1½ft. long. *l.*, produced ones eight to ten, 1in. to 1½ft. long, ½in. broad at base, linear-subulate, distichous, deeply channelled, often white-spotted towards the base; marginal prickles few, very minute. Shiré Highlands, Tropical Africa, 1894.

A. ciliaris (ciliated). The correct name of *A. ciliata.*

A. ferox (fierce). *fl.*, perianth red, clavate, 1½in. long; raceme very dense, 1ft. or more in length; pedicels very short; peduncle 2ft. long, branched near the base. *l.* thirty to fifty, densely aggregated, lanceolate, 1½ft. to 2ft. long, 4in. to 6in. broad, with thick, brown marginal prickles. Stem 10ft. to 15ft. high, 4in. to 6in. thick. (B. M. 1975.)

A. heteracantha (variable-spined). *fl.* bright coral-red, 1½in. long; spike elongated, dense; flower-stem branching. *l.* in a rosette, lanceolate, acuminate, 6in. to 12in. long, 1½in. to 2½in. broad, unarmed, or with a few teeth on the margins, and with one or two raised lines down the face. Native country unknown. 1886. (B. M. 6863.)

Aloë—*continued.*

A. Hildebrandtii (Hildebrandt's). *fl.*, perianth cylindrical, less than 1in. long, the outer segments red, the inner ones reddish-yellow, with a green keel; panicle lax, 1½ft. long; peduncle short, compressed. *l.* loosely disposed, spreading, lanceolate, 6in. to 10in. long, 1½in. to 2in. broad at the clasping base, gradually tapering to an acuminate point, rounded at back, the margins toothed. Stem simple, erect, 1½ft. to 2ft. long. Eastern tropical Africa, 1882. (B. M. 6931.)

A. insignis (remarkable). *fl.* racemose, numerous; perianth whitish, lined green towards the apex, straight, fifteen to sixteen lines long; stamens exserted; peduncle 18in. to 20in. high, clothed with whitish bracts. *l.* thirty to forty, ascending, often incurved and slightly falcate, glaucous-green, 7in. to 11in. long, 1in. to 1½in. broad at base, tapering to a fine point, with tubercular points on the convex back. Stem about 3in. high. 1885. Hybrid. (G. C. n. s., xxiv., p. 41.)

A. Kirkii (Kirk's). *fl.* reddish-yellow, tipped with brown, above 1in. long; inflorescence 2ft. long, with three branches; racemes dense, the end one nearly 1ft. long. *l.* thirty to forty in a dense rosette, spreading, lanceolate, nearly 1ft. long, 2in. broad, ¼in. thick, very smooth, with large marginal teeth. Caudex short, stout, erect. Zanzibar, 1893. (B. M. 7386.)

A. longiaristata (long-awned). A synonym of *A. aristata.*

A. longiflora (long-flowered). *fl.*, perianth primrose-yellow, cylindrical, 1½in. long; raceme dense, simple, 6in. to 8in. long; pedicels erecto-patent; peduncle shorter than the raceme. *l.* spreading, ensiform, 1¼ft. to 1½ft. long, 1½in. broad, gradually tapering to a long point, glossy-green, unspotted, with crowded marginal teeth. Stem simple, 1½ft. long below the rosette. 1885. (G. C. 1883, iv., p. 756.)

A. Luntii (W. Lunt's). *fl.* reddish-green at the tips, less than 1in. long; panicle consisting of four or five long, lax, racemes, the side ones spreading horizontally. *l.* seven or eight in a dense rosette at the top of the stem, ensiform, 1ft. long, 2in. broad, unarmed, thick, recurved. Southern Arabia, 1894. Plant shortly caulescent. (B. M. 7448.)

A. Monteiroi (Mrs. Monteiro's). *fl.*, perianth dull red, cylindrical, 1in. long; raceme moderately dense, 4in. to 6in. long, 2½in. in diameter; pedicels ascending, ½in. long; peduncle simple, 1½ft. long. *l.* about a dozen in a dense rosette, ensiform, 1ft. long, 1in. broad, gradually tapering to a point, copiously spotted, armed with medium teeth. Stem very short. 1889. (G. C. 1889, vi., p. 523.)

A. penduliflora (pendulous-flowered). *fl.* pale yellow; raceme dense, turned up at the extremity of the pendulous scape. *l.* lax, attenuated, pale green, flattish above, having small marginal prickles. Zanzibar, 1883. A distinct plant, remarkable for the way in which the pendulous scape appears to arise from the base of the back of the leaves. (G. C. 1888, iv., p. 178.)

A. pratensis (meadow-loving).* *fl.*, perianth bright red, tipped green, cylindrical, 1¼in. long; segments lanceolate, united only at the base; pedicels ascending; raceme dense, cylindrical, 6in. to 12in. long; peduncle stout, simple, 1ft. or more long, with copious, empty bracts. *l.* sixty to eighty in a dense rosette, oblong-lanceolate, acuminate, the outer ones 5in. to 6in. long, the inner ones smaller, 1½in. broad at base, margined with red-brown spines. Plant stemless. (B. M. 6705.)

A. Schweinfurthii (Schweinfurth's). *fl.* orange and yellow, disposed in tall, much-branched, many-flowered panicles. *l.* tufted, fleshy, lanceolate, acuminate, remotely toothed on the margins. North-east tropical Africa, 1893. A magnificent species. (B. M. 7667.)

A. striata is the correct name of *A. albocincta.*

A. s. oligospeila (few-stained). This differs from the type in its narrower leaves with a broad white border, taller stem, and more erect habit. 1894.

A. volubilis. *See* **Bowiea volubilis.**

HYBRIDS. A number of Aloë hybrids have been raised within the last few years, of which the following may be mentioned, the names of the parents, where known, being given in parentheses.

A. Bedinghausii (*Gasteria nigricans* and *A. longiaristata*).

A. Beguinii (*Gasteria verrucosa* and *A. longiaristata*).

A.(?) Chludowii (probably *Gasteria scaberrima* and *G. verrucosa*).

A. cyanea (*A. glauca* and *A. incana*).

A. de Laetii (*A. ciliaris* and *A. succotrina*).

A. Derbetzi (*Gasteria acinacifolia* and *A. rubro-cincta*).

A.(?) Holtzei (*Gasteria verrucosa* and *Haworthia Radula*).

A. Hoyeri (*A. serrulata* and *Lomatophyllum borbonicum*).

A.(?) hybrida gloriosa (*Lomatophyllum borbonicum* and *Gasteria maculata*).

A. imbricata (parentage not stated).

A. Lapaixii (*Gasteria maculata* and *A. longiaristata*)

A.(?) Lauchei (*Gasteria pulchra* and *G. scaberrima*).

A. Nowotnyi (*A. longiaristata* and ?).

A.(?) Quehlii (*Gasteria maculata* and *G. picta*).

A. Simoniana (*Gasteria disticha* and *A. longiaristata*).

ALONA belongs to TRIBE *Nolaneæ* of ORD. *Convolvulaceæ.* It embraces half-a-dozen species, confined to Chili.

ALONSOA. SYN. *Hemimeris* (of Humboldt, Bonpland, and Kunth). About a dozen species of this genus have been described; they are found on the Andes of tropical America, from Peru to Mexico. To those given on p. 53, Vol. I., the following should be added:

A. acutifolia (acute-leaved). *fl.* scarlet; anterior lobe of the corolla three or four times as long as the calyx; raceme long and loose. June. *l.* petiolate, ovate-lanceolate, serrated, narrowed at base. Branchlets elongated. Peru, 1790. (R. G. 849.)

A. intermedia (intermediate). A synonym of *A. incisifolia.* SYNS. *Celsia urticæfolia* (B. M. 471), *Hemimeris intermedia* (L. B. C. 1456).

A. linifolia gracilis (slender). The bright orange-scarlet flowers and graceful foliage combine to make this more effective than the type.

ALOYSIA. Bentham and Hooker include this under **Lippia** (which *see*).

ALPINE. Growing on mountains above the timber-line.

ALPINE GARDENS. Below is given a selection of plants which are suitable to the Alpine or rock garden. Many of them are also adapted for the front row of a select border, and the majority are free-growing. Shade-lovers are distinguished by an asterisk (*), and border-plants by a dagger (†).

Acæna microphylla, A. repens, and *A. myriophylla; Acantholimon glumaceum; Achillea rupestris, A. tomentosa, A. umbellata,* and *A. Clavennæ;* †*Adonis vernalis* and *A. pyrenaica;* †*Æthionema coridifolium* and *Æ. saxatile; Ajuga genevensis;* †*Allium* in variety; †*Alyssum montanum, A. saxatile,* and *A. s. compactum; Androsace carnea, A. lanuginosa,* and *A. sarmentosa;* †*Anemone apennina,* †*A. narcissiflora,* **A. Pulsatilla,* †*A. fulgens,* **A. Hepatica,* and **A. vernalis;* †*Antennaria tomentosa,* useful for dry, hot places; *Anthyllis montana;* **Aquilegia glandulosa;* †*Arabis albida, A. procurrens,* and *A. graminifolia;* †*Armeria* in variety for dry places; †*Aster alpinus;* †*Aubrietia deltoidea Campbelli,* †*A. d. græca,* †*A. d. grandiflora,* †*A. d. Hendersoni* and *A. d. Leichtlinii; Auricula* (Alpine) in variety. *Brodiæa,* all the species; *Bulbocodium vernum. Callirhoe involucrata; Calochortus* in variety; *Campanula garganica,* and many other species; *Cerastium tomentosum; Chionodoxa Luciliæ, C. Alleni,* and *C. sardensis; Colchicum,* many species; †*Corydalis lutea,* dry places; *Crocus* species, especially *C. speciosus,* and the winter-flowering kinds; **Cyclamen europæum,* **C. hederæfolium,* and *C. repandum. Daphne Blagayana;* †*Dianthus neglectus,* †*D. cæsius,* and †*D. alpinus;* **Dodecatheon Meadia alba,* **D. Hendersoni,* and *D. Jeffreyi; Draba Mawii* and *D. pyrenaica;* and *Dryas octopetala. Eranthis hyemalis; Erica* in variety; *Erinus alpinus; Erysimum pulchellum,* for dry places; and *Erythronium* in variety. *Fritillaria,* all the small kinds. *Geum montanum;* and *Gnaphalium Leontopodium. Helianthemum,* for very hot, dry banks; and †*Heuchera sanguinea* and *L. s. grandiflora. Iberis correæfolia* and Little Gem; *Ionopsidium acaule;* and *Iris reticulata, I. Bakeriana, I. persica,* and many other species. *Leucoium,* several species; *Linaria alpina* and *L. pallida; Lithospermum graminifolium* and *L. prostratum;* and *Lychnis alpina.* †**Meconopsis cambrica;* †*Muscari,* all the species; *Morisia hypogæa;* and *Myosotis alpestris* and *M. semperflorens. Narcissus minimus,* and other small species and varieties. *Œnothera macrocarpa;* **†Omphalodes verna;* and *Onosma echoides. Phlox,* various kinds; *Phyteuma Scheuchzeri,* and var. *Charmelii* and *P. Michelli;* †*Primula cortusoides,* †*P. denticulata,* †*P. cashmiriana* and *P. marginata;* and †*Prunella grandiflora.* **Ramondia pyrenaica. Saxifraga Sempervivum,* and *Sedum* in variety; **Shortia galacifolia; Silene,* many species; *Soldanella alpina, S. minima, and*

Alpine Gardens—*continued.*

S. montana; and *Statice tatarica.* †*Tiarella cordifolia;* and **Trillium grandiflorum. Veronica prostrata,* and *V. Teucrium. Wahlenbergia tenuifolia. Zauschneria californica.*

ALPINE ROSE APPLE. This is the popular name for a very characteristic gall-like excrescence occurring on the leaves of *Rhododendron hirsutum* and *R. ferrugineum,* two of the most extensively planted of alpine shrubs. They vary considerably as to size and texture, but are of a dirty creamy-white, tinged on the sunny side with a bright pink, and in summer are covered with a kind of bloom. The fungus responsible for the malformation is *Exobasidium Rhododendri,* of the group *Basidiomycetes,* to which belong several of the most destructive tree-fungi in *Agaricus* and *Polyporus,* as well as some of the most useful, considered from an economic point of view—the edible Mushrooms. The galled parts should be removed and burned as soon as they are noticed. They are also called Rhododendron Galls.

ALPINIA. SYNS. *Albina, Buekia, Catimbium, Galanga, Heritiera* (of Retz), *Languas,* and *Martensia.* Including *Hellenia.* ORD. *Scitamineæ.* This genus comprises nearly forty species, natives of tropical and subtropical Asia, Australia, and the Pacific Islands. To those described on p. 54, Vol. I., the following should be added:

A. Allughas (Allughas). *fl.* small, crowded; corolla segments greenish-white, linear-oblong; lip pink, cuneate, distinctly emarginate; panicle erect, 6in. to 12in. long, narrow. February and March. *l.* oblong-lanceolate, 1ft. to 1½ft. long, 3in. to 6in. broad, glossy on both surfaces. Stem 3ft. to 6ft. high. India, &c., 1796. SYN. *Hellenia Allughas* (A. B. R. 501).

A. auriculata (auricled). *fl.* reddish-yellow, smaller than in *A. nutans;* raceme nodding, many-flowered. Spring. *l.* lanceolate, unequal-sided, 2ft. long, reddish-pilose on the margins and on the nerves beneath. Stems pubescent, 10ft. to 12ft. high. Southern Asia, 1814.

Alpinia—*continued.*

A. cærulea (blue). *fl.* reddish-purple, less than 1in. long; thyrse terminal, 4in. to 8in. long, appearing as a simple raceme at first, but most of the peduncles developing two to six flowers. May. *l.* oblong-lanceolate, often above 1ft. long and 2in. broad, acutely acuminate, shortly petiolate above the sheath. Stem 4ft. to 5ft. high. Australia, 1820. SYN. *Hellenia cærulea.*

A. calcarata (spurred). *fl.* medium-sized; corolla segments greenish-white, oblong; lip beautifully variegated with red and yellow on a pale ground, the edges slightly incurved, the base spurred; panicle dense, 3in. to 4in. long. September. *l.* lanceolate, 6in. to 12in. long, 1in. to 2in. broad, acuminate, glossy on both surfaces. Stem slender, 2ft. to 4ft. high. India and China, 1800. (B. R. 141.) SYN. *A. cernua* (B. M. 1900).

A. cernua (drooping). A synonym of *A. calcarata.*

A. magnifica (magnificent). A synonym of *Amomum magnificum.*

FIG. 36. ALSOPHILA ASPERA.

A. malaccensis (Malaccan). *fl.*, corolla segments white, oblong, 1in. long; lip ovate, emarginate, 1½in. to 2in. long, the margins pale, the centre beautifully variegated with red and yellow; raceme erect, simple, 6in. to 12in. long. April. *l.* 2ft. to 3ft. long, oblong-lanceolate, pubescent beneath. Stem 6ft. to 10ft. high. India, &c., 1799. (B. R. 328.)

A. officinarum (officinal). *fl.* white, sessile in a simple spike; lip oblong, obtuse, entire or emarginate, the disk nerved with blood-red. Winter. *l.* narrow-lanceolate, caudate-acuminate, highly glabrous, narrowed to a sessile sheath at base; sheath elongated, produced in an erect ligule. Stem tuberous at base, erect, leafy. South China, 1883. (B. M. 6995.)

A. pumila (dwarf). *fl.* about 1in. long, in a short, rather dense spike, about two to each bract, sessile, sub-erect; calyx bright red; corolla pink, the lip recurved or almost revolute; scape or flowering stem radical, about 2in. long. April. *l.* two or three together, erect from the rootstock, 4in. to 6in. long, elliptic or elliptic-lanceolate, acuminate, green, with whitish stripes, pale green beneath; petioles 2in. to 4in. long, sheathing below. Lo-fan-Shan Mountains, China, 1883. (B. M. 6832.)

Alpinia—*continued.*

A. zingiberina (Zingiber-like). *fl.* erect, 1in. long; calyx about ¼in. long; lateral and dorsal lobes of the corolla pale green; lip white, veined crimson, broadly ovate, obtuse; panicle nearly erect, 10in. to 12in. long. July. *l.* 10in. to 12in. long, 3in. broad, oblanceolate-oblong, acute and abruptly cuspidate, glabrous. Stems 4ft. to 5ft. high. Rhizomes 1in. in diameter, resembling ginger. Siam, 1824. (B. M. 6944.)

ALSEUOSMIA (from *alsos*, a grove, and *euosmia*, a grateful odour; the powerful fragrance of the flowers scents the woods in their native haunts). ORD. *Caprifoliaceæ*. A small genus (four species) of highly glabrous, polymorphous, greenhouse shrubs, confined to New Zealand. Flowers greenish or reddish, axillary, solitary or fascicled, sweetly scented; calyx tube ovoid, the limb four- or five-lobed; corolla tubular or funnel-shaped, the tube elongated, the limb of four or five equal, spreading lobes; stamens four or five; pedicels bracteolate at base. Fruit a purple, ovoid, many-seeded berry. Leaves alternate, rarely opposite, petiolate, membranous, linear-lanceolate, ovate, or rhomboid, entire or toothed, with minute tufts of hairs in the axils of the nerves beneath. *A. macrophylla* is the only species introduced to cultivation. It thrives in well-drained, peaty soil, and likes plenty of air and light. Propagated by cuttings of half-ripened growths, inserted under a bell glass.

A. macrophylla (large-leaved).* *fl.* in small, axillary clusters, drooping; corolla dull red, or creamy-white with dull red streaks, the tube cylindric, funnel-shaped above, the lobes ovate, recurved, toothed. February. *l.* 3in. to 6in. long, elliptic-lanceolate or oblanceolate, acute, entire or serrated, narrowed into petioles ¼in. to ½in. long. *h.* 6ft. to 10ft. 1824. Plant glabrous. (B. M. 6951.)

ALSINE. Included under **Arenaria** (which *see*).

ALSOMITRA (said to be derived from *alsos*, a grove, and *mitra*, a mitre; probably in allusion to the plant crowning the trees). ORD. *Cucurbitaceæ*. A small genus (three to five species) of large, stove, climbing shrubs, extending from Nepaul through Malaya to North Australia. Flowers white, small, dicœcious, in compound panicles; calyx and corolla both rotate and five-parted; stamens five. Fruit often large, elongated. Leaves having three oblong, entire leaflets. Tendrils simple or bifid. Only one of the species has been introduced. It thrives in a rich loamy compost and requires an abundance of water during the period of growth. It may be propagated by seeds, or by cuttings inserted over bottom-heat.

FIG. 37. ALSOPHILA ATROVIRENS.

A. sarcophylla (fleshy-leaved). *fl.* very numerous, in nodding panicles. Winter. *fr.* 1¾in. long, ⅝in. broad. *l.* very fleshy, 2½in. long, 1⅜in. broad, obtuse; petiolules scarcely ¼in. long. Birma, 1870. SYN. *Zanonia sarcophylla.*

ALSOPHILA. Including *Lophosorus*, *Trichopteris*, and *Trichosorus*. Upwards of ninety species have been referred to this genus; they are found in Australia, New Zealand, South America, India, tropical Africa, Eastern Asia, &c.

Nearly all the Alsophilas are found inhabiting moist glens, and have a tendency to assume large proportions. Some of them, such as *A. australis*, *A. conjugata*, *A. contaminans*, *A. Cooperi*, *A. Leichardtiana*, *A. pycnocarpa*, &c., are frequently seen in their native habitats with stems varying between 20ft. and 30ft. in height; while

Alsophila—*continued.*

A. excelsa, perhaps the most rapid grower of all, is said to have a trunk or stem between 60ft. and 80ft. high.

To induce them to make good growth under artificial conditions, it is necessary that the Alsophilas, as well as all other Tree-Ferns, should have an abundant supply of water during the summer, but taking care to moderate the sprinklings during the winter—without, however, suspending them altogether in any case. Occasional waterings with weak liquid manure are beneficial to them, especially in the spring when the new fronds are unfolding. Although Alsophilas grow well in a light conservatory, where they produce fronds of a hardy and very substantial texture, it is under the combined influences of shade and moisture that their most vigorous growth is produced; they should therefore be sufficiently shaded to prevent the sun from burning the fronds as they unfold, as well as to keep them from being discoloured when fully developed. As is the case with all arborescent Ferns, very little pot room will suffice for Alsophilas. They should be potted, tubbed, or, better still, planted out in the houses, in a compost of three-parts peat, one part fibrous loam, and one part sand as coarse as procurable: in this they will grow luxuriantly for years without requiring further attention than constant moistening.

A. capensis, *A. Van Geertii*, and perhaps a few other kinds, produce on their stems young growths, from which they can be propagated; but Alsophilas are usually increased from spores, which are abundantly produced and germinate freely under warm treatment.

A. excelsa is essentially a decorative Fern, growing larger and quicker than *A. australis*; young plants of it are extensively employed for indoor decoration, as very little time is required from the seedling state to get them sufficiently strong to be useful for that purpose; but those home-raised seedlings which are kept and grown on, soon form short stems or trunks, producing fine heads of massive yet gracefully-arching fronds, often reaching 4ft. in length. When in that state, *A. excelsa* is a most effective plant for sub-tropical gardening.

Although very scarce in cultivation, *A. pruinata* deserves every attention, if only on account of its distinctive and ornamental characters, for its fronds, of a particularly elegant habit, are quite as silvery underneath as those of the better-known *Cyathea dealbata*; while the stem or trunk from which they are produced, and which under cultivation seldom attains large proportions, usually forms several crowns or heads, and by the division of these the plant can be increased. To those described on pp. 54-6, Vol. I., the following should be added:

FIG. 38. ALSOPHILA PYCNOCARPA.

A. Andersoni (Anderson's). *fronds* large, tripinnatifid, rough on their under-surface; rachis dark chestnut-colour; pinnæ oblong-lanceolate, 1½ft. to 2ft. long; pinnules numerous, almost stalkless, cut down to a narrow wing 4in. to 6in. long and 1in. broad; ultimate segments closely set, spear-shaped, bluntish, about ¼in. broad, distinctly toothed, their ribs densely bristly. *sori* very small, inframedial. Sikkim. A distinct, stove species.

A. aspera (rough). An illustration of this fine West Indian species is given in Fig. 36.

A. atrovirens (dark green).* *sti.* about equal to the fronds, stout, and slightly scaly. *fronds* large, tripinnatifid; pinnæ spear-shaped, 9in. to 15in. long, 3in. to 4in. broad; pinnules cut down half-way to the midrib; segments entire, ¼in. broad. *sori* small, numerous, medial. South Brazil, 1883. Stove. See Fig. 37.

Alsophila—*continued.*

A. a. Keriana (Ker's). *sti.* 6in. to 8in. long, dull brown, muricated. *fronds* oblong-lanceolate, bipinnate, 1¼in. to 1½in. long, 6in. broad, firm, pilose on the main veins beneath; lower pinnæ 3in. to 4in. long, cut down to the rachis. 1884.

A. capensis (Cape). A synonym of *Hemitelia capensis.*

A. Colensoi (Colenso's). *cau.* 4ft. to 5ft. high, spineless. *sti.* short, densely clothed with silvery-white scales and smaller brown ones. *fronds* slightly hairy, 2ft. to 4ft. long, 1ft. or more broad; primary pinnæ 12in. to 14in. long, acuminate; pinnules 2in. long and ¼in. broad, deeply pinnatifid; ultimate segments strongly serrated. *sori* small, round, nearer the midrib than the margin. New Zealand and Otago. Greenhouse.

A. crinita (hairy).* *sti.* strongly muricate, of a peculiar brown colour. *fronds* when young densely covered with long, chaffy hairs of a light colour; primary pinnæ 2ft. long, 10in. broad; pinnules sessile, cut nearly to the midrib; ultimate lobes sickle-shaped, narrow, the margins recurved and toothed. *sori* covering the whole under-side of the lobes and mixed with scales. Java, Ceylon, &c. A singular and very shaggy-looking, stove species.

A. infesta phalerata (white). *fronds* having the segments ¼in. broad, close, blunt, entire. *sori* larger than in other forms, confined to the lower veins.

A. latebrosa (dark, shady). *sti.* prickly at base, muricated upwards, dark mahogany-brown. *fronds* bipinnate; pinnæ 1ft. to 2ft. long, 6in. to 8in. broad, acuminate; pinnules lanceolate, acuminate, 3in. to 4in. long, ½in. broad, cut down nearly to the rachis into numerous narrow, blunt, slightly-toothed lobes, dark green and smooth above, slightly hairy and scaly beneath. *sori* elevated and conspicuous, often occupying the lower two-thirds of the fertile lobes. India, &c. Stove. According to Beddome, this is the commonest Tree Fern throughout India.

A. Marshalliana (Marshall's). *fronds* of a dark, shining green; pinnæ very much crisped and gracefully waved. 1894. A plant of dwarf habit.

A. phalerata (white). A variety of *A. infesta.*

A. podophylla (footstalk-fronded). *sti.* spiny, and, as well as the rachis, purplish-brown. *fronds* ample, somewhat leathery; pinnæ 2ft. or more in length, pinnatifid at their summit; pinnules distinctly stalked, 4in. to 8in. long, ½in. to 1in. broad, variable, being either sub-hastate, cordate, or truncate at base, sometimes either toothed towards their tip, entire, slightly lobed, or more or less deeply cut to the midrib. *sori* in a single row parallel with the primary vein of the fertile pinnules. Chusan and Hong Kong, 1881. Greenhouse.

A. pycnocarpa (densely-fruited). *cau.* thorny, seldom exceeding 6ft. in height. *fronds* ample, coriaceous, bipinnate; pinnæ borne on short, articulated stalks; pinnules nearly stalkless, dented at the base, blunt at the tip, dark green on both surfaces. *sori* set so closely together in two rows as to be almost contiguous on the fertile pinnules. Peru. Stove. See Fig. 38.

A. tomentosa (downy). *sti.* and main rachis palish brown, strongly muricated. *fronds* coriaceous, dark green above; pinnules sessile, divided nearly to the midrib into narrow-oblong lobes which are conspicuously cobwebby on their under-side with small, white, ragged, woolly scales. *sori* covering the whole under-surface. Java and Formosa. Stove. This resembles *A. crinita*, but is scarcely hairy in any part.

A. truncata (truncate). *fronds* ample, tripinnate, with a glossy, dark purple rachis; pinnæ 10in. to 15in. long, 4in. to 5in. broad, oblong, acuminate; pinnules very small, stalkless, set at a little distance apart, truncate at base, firm, coriaceous, bright green above, paler beneath, the margins slightly lobed and recurved. *sori* small, dark orange-colour, close to the midrib of the fertile pinnules. Fiji and Samoa. A distinct, stove species.

A. Van Geertii (Van Geert's). A garden name for *Cyathea mexicana.*

ALSTRÖMERIA. According to J. G. Baker, this genus camprises about forty-four species, confined to Brazil and Chili.

For affording cut-flower material, such species as *A. aurantiaca*, *A. chilensis*, and *A. psittacina*, are highly esteemed. Many cultivators experience difficulty in growing these useful plants. The chief point to observe is in the planting. This should take place in October, inserting the roots from 6in. to 8in. deep. If, as is commonly done, they are planted at, say, a depth of 3in. or 4in., they are almost certain to be killed if severe weather sets in. Plenty of water when growing, and a summer mulching, will also be found beneficial.

To the species, &c., described on p. 58, Vol. I., the following should be added. Several plants formerly included here are now classed under **Bomarea.**

A. aurea (golden) (B. M. 3350). A synonym of *A. aurantiaca* (B. R. 1843; S. B. F. G. ser. ii. 205).

A. bicolor (two-coloured). A synonym of *A. Ligtu pulchra.*

Alströmeria—*continued.*

A. brasiliensis (Brazilian). *fl.*, perianth reddish-yellow, 1¼in. long, the inner segments spotted with brown; umbel of five one- to three-flowered rays. *l.* of the fertile stem linear, erecto-patent, 3in. to 4in. long; those of the sterile stem lanceolate, 3in. to 4in. long, ¾in. broad, mainly confined to the upper half. Sterile stem 2ft. long. Central Brazil.

A. densiflora. The correct name is *Bomarea tomentosa.*

A. hæmantha (blood-coloured). The correct name of *A. Simsii* (B. G. 264; S. B. F. G. ser. ii. 158). SYN. *A. pulchella* of Sims (B. M. 2354; B. R. 1008; H. E. F. 64).

A. h. Simsii (Sims's blood-flowered). A synonym of *A. Simsii.*

A. Hookeri, of Loddiges. A form of *A. Ligtu.*

A. Ligtu (Ligtu). *fl.* whitish, pale lilac, or pale red, obliquely streaked with purple; perianth about 1½in. long, the outer segments obovate-unguiculate, the inner ones narrower and more acute; umbel three- to eight-rayed. *l.* twenty to thirty, thin, linear or lanceolate, the largest 2in. to 3in. long. Stem 1½ft. to 2ft. long. Chili. (B. R. 1839, t 3). *A. Hookeri* (L. B. C. 1272), *A. pallida* (B. M. 3040), and *A. rosea* (H. E. F. 221), are forms of this species.

A. L. pulchra. The correct name of *A. pulchra* (B. M. 2421). SYN. *A. bicolor* (H. E. F. 65; L. B. C. 1147).

A. Ligtu, of Curtis. A synonym of *A. caryophyllæa.*

A. Neillii (Neill's). A form of *A. spathulata.*

A. oculata (eyed). A synonym of *Bomarea Salsilla.*

A. ovata (ovate). A synonym of *Bomarea edulis ovata.*

A. pallida (pale). A form of *A. Ligtu.*

A. pulchella, of Linnæus, is the correct name of *A. psittacina*, which is quite distinct from *A. Simsii* (*hæmantha*).

A. rosea, of Hooker, is a form of *A. Ligtu.*

A. Salsilla (Salsilla), of Gawler. A synonym of *Bomarea edulis.*

A. spathulata (spathulate). *fl.* reddish, few in a simple umbel; perianth 1in. to 1½in. long, the outer segments obovate-unguiculate, the inner ones acute. *l.* crowded in the upper part of the stem, oblong-spathulate, thick, crisped, and scarious at the edges, 1in. to 2in. long, ¼in. to ¾in. broad. Stem 6in. to 12in. long. Andes of Chili. *A. Neillii* (B. M. 3105) is "probably a robust cultivated condition" of this species (Baker).

ALTERNANTHERA. Leaves opposite, sessile or petiolate, obovate, oblong, or linear, entire or obscurely toothed. To the species described on p. 59, Vol. I., the following should be added:

A. chromatella (yellowish). This is probably identical with *A. paronychioides major aurea.*

A. sessilis (stalkless). *l.* 1in. to 3in. long, linear, oblong, lanceolate, or elliptic, obtuse or slightly acute, rather fleshy, sometimes obscurely denticulate. Branches many, 3in. to 18in. long, glabrous, prostrate or ascending. India, 1778. Biennial.

A. s. amœna (pleasing). In this variety the upper leaves are reddish. (I. H. 1865, t. 447.)

A. spathulata (spoon-shaped). A handsome form, having spathulate leaves varying in colour from green, through pink, to dark brown. 1865. (I. H. 1865, t. 445.)

ALTHÆA. About a dozen species, natives of the temperate regions of the globe, form this genus, two of them—*A. hirsuta* and *A. officinalis*—being natives of Britain. To the species described on p. 59, Vol. I., the following should be added:

A. rosea is not a native of China, as stated in Vol. I., but of the Orient.

A. sulphurea (sulphur-coloured).* *fl.* sulphur-yellow, on thick, solitary, tomentose peduncles; petals more than twice as long as the calyx, ciliated to the claws; raceme short, lax, few-flowered. Summer. *l.* thick, ovate, obtuse, crenulate, entire or very slightly repand-trilobed, the lower ones obtuse and rounded at base, the upper ones slightly acute and cuneate at base. Stems erect, rigid, simple or slightly branched. Persia, &c. Plant shrubby at base.

ALTINGIACEÆ. Included under **Hamamelideæ** (which *see*).

ALTITUDE. Elevation or altitude has a great influence on all vegetation. The higher the altitude the lower the temperature. At the same time, this does not prove that the less the elevation is above sea-level the warmer and more suited is the place for plant-life. An altitude of 500ft. above sea-level is considered by some authorities to be best for hardy fruit-culture; while in this country ordinary timber grown at a moderate elevation is more durable than the same kind grown nearer the sea-level.

ALTORA. A synonym of **Cluytia** (which *see*).

ALUM. *See* **Symphytum officinale.**

ALYSSUM. Including *Anodontea*, *Berteroa*, *Meniocus*, *Odontarrhena*, *Psilonema*, and *Schivereckia*. This genus comprises from eighty to ninety species, natives of Asia Minor, South Europe, Persia, North Africa, the Caucasus, and Siberia, *A. calycinum* and *A. maritimum* being natives of the British Islands. To those described on pp. 60-1, Vol. I., the following should be added:

A. gemonense sulphureum (sulphur-coloured). This is the most distinct in colour of all the Alyssums, being of a nice pale lemon.

A. pyrenaicum (Pyrenean). *fl.* white, with chocolate-coloured anthers. June to August. *l.* obovate, attenuated at base, cano-tomentose. Stem shrubby; branches unarmed. Habit dwarf, tufted.

A. saxatile citrinum (citron-yellow). This has lemon-yellow flowers.

A. s. flore-pleno (double flowered).* This is a double-flowered form of considerable merit. The flowers are bright yellow, and borne in sprays.

A. s. nanum compactum (dwarf, compact).* A dwarf variety, forming dense tufts, composed of a great number of short stalks producing yellow flowers much more freely than the type. June to August. An excellent plant for borders or for carpet-bedding, popularly known as Gold Dust.

A. spinosum (spiny). The correct name of *Kœniga spinosa*.

A. utriculatum (bladder-like). A synonym of *Vesicaria græca*.

ALYXIA (said to be the native Indian name of one of the species). SYN. *Gynopogon*. ORD. *Apocynaceæ*. A genus embracing about thirty species of stove, often glabrous shrubs, inhabiting Eastern tropical Asia, the Malayan Archipelago, Ceylon, Madagascar, tropical Australia, and the Pacific Islands. Flowers rather small, twin or cymose; calyx five-parted, glandless; corolla salver-shaped, with a cylindrical tube and five twisted lobes; stamens included. Leaves whorled in threes or fours, or rarely opposite, coriaceous, shining, penniveined. The best-known species are here described. They thrive in a mixture of sandy loam and a little peat. Cuttings of ripened wood will root freely if inserted in pots of sand, under glass, and plunged in heat.

A. bracteolosa (slightly bracteate). *fl.* pale yellow, with a long tube; cymes axillary, many-flowered, shortly pedunculate. *l.* in threes, oblong or sub-lanceolate, obtuse or acuminate at apex, rounded or acute at base. Fiji, 1887. Climber.

A. daphnoides (Daphne-like). *fl.* yellowish-white, sessile, axillary and terminal, solitary. April. *l.* in fours, obovate-oblong, elliptic, or rhomboid, obtuse, shining, ¼in. to ¾in. long. *h.* 4ft. Norfolk Island, 1831. (B. M. 3513.)

A. ruscifolia (Butcher's-Broom-leaved). *fl.* white, small, sessile, in sessile, terminal heads. July. *l.* whorled, broadly ovate-elliptic to narrow-lanceolate, acute, with a short, pungent point, ¾in. to 1¼in. long, shortly petiolate, the margins recurved or revolute. Australia, 1820. A tall, handsome shrub. (B. M. 3312; L. B. C. 1811.)

ALZATEA (named after Alzaty, a Spanish naturalist). ORD. *Celastrineæ*. A monotypic genus. The species, *A. verticillata*, is a greenhouse, evergreen, highly glabrous tree, with yellowish flowers, opposite whorled leaves, and purple branches. It was introduced in 1824, but is probably lost to cultivation.

AMALIAS. A synonym of **Lælia** (which *see*).

AMARABOYA (the native name). ORD. *Melastomaceæ*. A small genus (three species) of erect, glabrous, stove or greenhouse, evergreen shrubs, natives of Colombia. Flowers showy, cymose; petals usually six, cordate; stamens twelve to fifteen. Leaves large, opposite, sessile, with three very prominent nerves, green above, reddish-carmine beneath. Branches as thick as the thumb, bluntly four-angled. The species will probably thrive under the same treatment as that recommended for **Pleroma** (which *see*).

A. amabilis (lovely). *fl.* white, margined with carmine, large; petals broad; style red, elongated; umbels terminal. *l.* 10in. to 12in. long, 8in. broad, opposite, elliptic, canescent beneath, the three nerves brownish or reddish. Stems terete, purplish. 1837. (I. H. ser. v. 9.)

Amaraboya—*continued.*

A. princeps (foremost). *fl.* of a uniform bright carmine, very showy; petals usually six, broadly cordate; stamens white; cymes terminal, few-flowered; peduncles stout. *l.* elliptic, sessile, apiculate, 7in. to 10in. long, 3in. to 5in. broad, green above, reddish-brown beneath. 1887. (I. H. ser. v. 4.)

A. splendida (splendid). *fl.* 6½in. across, very beautiful; petals sub-triangular, 3in. long, nearly 2½in. broad, at first reddish-pink, becoming white in the lower part; stamens yellowish; style red, elongated. *l.* very large, ovate-oblong, green above, coppery-pink with three red nerves beneath. 1886. A gorgeous plant. (I. H. ser. v. 34.)

AMARALIA. This name is kept up by the authors of the "Genera Plantarum"; but according to the "Index Kewensis," the older name for the genus is **Sherbournia** (which *see*).

AMARANTUS [also spelt *Amaranthus*]. Including *Euxolus*. About forty-five species have been described, but many of these have no claim to specific rank; they are broadly distributed in both Old and New Worlds. Leaves small or minute. To the species, &c., described on p. 61, Vol. I., the following should be added:

A. atropurpureus nanus (dark purple, dwarf). A form of *A. caudatus*.

A. caudatus atropurpureus nanus. *fl.* in rather long, erect, cylindrical spikes. *l.* of a dark reddish-brown. *h.* about 1½ft.

A. c. gibbosus (swollen). *fl.* red, clustered in groups about the size of a nut and more or less spaced. Plant smaller and slenderer than the type, and singular in appearance.

A. Dussii (Duss's). *fl.* and *l.* brightly coloured. West Indies, 1896. A handsome, hardy annual, probably a variety of *A. spinosus*.

A. paniculatus (panicled), The correct name of *A. speciosus*. (B. M. 2227).

A. sanguineus nanus (dwarf). A dwarf garden variety, with leaves of an intense red.

A. spinosus (spiny). *fl.* greenish; terminal spike elongated, bending, the lower axillary ones short and roundish. July to October. *l.* ovate or ovate-oblong, obtuse or emarginate, long-petiolate, often blotched with purple, spiny in the axils. Stem 1ft. to 3ft. high, stout, succulent, often purplish. United States.

A. splendens (splendid). Joseph's Coat. *l.* regularly variegated with brown, dark green, red, and golden-yellow. Branches furnished at the extremities with loose panicles of brilliant red flowers, surrounded by leaves of the same tint. Stem vigorous, erect, and much-branched. *h.* 3ft. 1885. A garden form.

A. superbus (superb). *l.* elliptic, blood-red on the upper surface, crimson beneath. 1896. Half-hardy. Probably a variety of *A. melancholicus*. (I. H. 1896, p. 141, f. 15.)

AMARYLLIS. As mentioned on p. 62, Vol. I., the species formerly included here are now classed under various genera. The following synonyms and varieties may be noted:

A. aurea (golden). A synonym of *Lycoris aurea*.

A. Belladonna. There are numerous handsome varieties in cultivation, including *alba*, *carminea*, *magnifica*, *O'Brieni*, and *stenopetala*.

A. B. blanda (beautiful).* *fl.* lighter in colour, larger, and opening wider than in the type; segments 3in. to 4in. long, 1in. to 1¼in. broad. *l.* more sheathing at the base, longer, and broader. (B. M. 1450, under name of *A. blanda*.)

A. ciliaris (ciliated). A synonym of *Buphane ciliaris*.

A. citrina (citron-coloured). A synonym of *Sternbergia colchiciflora*.

A. crispa (curled). A synonym of *Hessea crispa*.

A. disticha (two-ranked). A synonym of *Buphane disticha*.

A. hyacinthina (Hyacinth-like). A synonym of *Griffinia hyacinthina*.

A. stellaris (star-like). A synonym of *Hessea stellaris*.

A. tatarica (Tartary). A synonym of *Ixiolirion tataricum*.

AMASONIA. The correct name of *A. punicea* (SYN. *Taligalea punicea*) is *A. calycina* (B. M. 6915). To the species described on p. 62, Vol. I., the following should be added:

A. erecta (erect). *fl.* white, marked with pink on the inside of the segments, hairy, drooping, 1in. long, disposed in a racemiform, elongated, terminal panicle; bracts scarlet, golden at base, subtending the flowers, ovate or nearly orbicular, serrulate. July. *l.* alternate and somewhat whorled, 4in. to

Amasonia—*continued.*

6in. long, crenate-serrate, oblong, dark green above, pale beneath; petioles 2in. to 3in. long. South America. A small, slender, sparingly-branched shrub.

A. e. latebracteata (broad-bracted). *fl.*, bracts orbicular, 1in. long, shortly petiolate, remotely denticulate. 1895. (B. M. 7445.)

AMATUNGULA. *See* **Carissa grandiflora.**

AMBERBOA MOSCHATA. A synonym of **Centaurea moschata** (which *see*).

AMBLOSTOMA (from *amblos*, blunt, and *stoma*, a mouth; in allusion to the form of the pollinia). ORD. *Orchideæ*. A small genus (three species) of stove, epiphytal Orchids, one Brazilian, another Peruvian, and the third Bolivian. Flowers small, shortly pedicellate, racemose, disposed in a slender, rigid panicle. Leaves narrow. *A. cernuum* (SYN. *A. tridactylum*) is in cultivation at Kew, but is not often seen elsewhere.

AMBLYANTHERA. A synonym of **Mandevilla** (which *see*).

AMBLYGLOTTIS. A synonym of **Calanthe** (which *see*).

AMBLYOLEPIS. Included under **Helenium** (which *see*).

AMBROSIA BEETLES. *See* **Apple-Bark Beetle.**

AMECHANIA. A synonym of **Agarista** (which *see*).

AMELANCHIER. SYN. *Aronia* (in part). The four species of this genus are natives of South Europe, Asia Minor, Japan, and North America. To the species described on p. 63, Vol. I., the following should be added. *See also* **Peraphyllum.**

A. alnifolia (Alder-leaved). Dwarf June Berry. *fl.* numerous, in dense racemes. *fr.* dark purple, globose, ¼in. in diameter. *l.* roundish, blunt or notched at both ends, serrated towards the apex. *h.* 6ft. to 8ft. North-west America, 1883. An ornamental shrub. (G. and F. 1888, i., p. 185, f. 34.)

A. Botryapium (Botryapium). A synonym of *A. canadensis*.

A. canadensis oblongifolia (oblong-leaved). *fl.* white, shortly-racemose, borne in great profusion. The last variety to blossom.

A. oligocarpa (few-fruited). *fl.* white, ½in. in diameter, on long pedicels, solitary or in pairs, rarely three or four in a raceme. *fr.* dark bluish-purple, obovate or shortly oblong. *l.* oblong, acute, crenulate, glabrous. *h.* 2ft. to 4ft. Eastern United States, 1883. A bushy tree. (G. and F. 1888, i., pp. 245-7, f. 41.)

AMERICAN BLACKBERRY. *See* **Rubus villosus.**

AMERICAN BLIGHT, or WOOLLY APHIS (*Schizoneura lanigera*). Despite the greater attention now given to fruit-trees by the cultivator, this insect continues to increase. And little wonder, considering how readily the white cottony "particles," together with the insects, are wafted by the wind, and the rapid methods of increase. The greatest number are to be found in neglected orchards, where trees are left for years "to take care of themselves." They are not, however, confined to such, for new plantations of young trees are also attacked. The insects generally take up a position in the crevices of the bark, on shoots both large and small, as well as on the foliage. The bark in bad attacks splits, and soft spongy growths are present. After a while these quite break down, exposing a vital part of the tree to injurious wound fungi. Hence it is that canker caused by *Nectria ditissima* is so frequently found. Woolly Aphides also attack the roots, and cause considerable injury if they are allowed to go on unmolested. At one time it was thought that the root-feeding specimens were somewhat different from those infesting the portions of the tree above ground. Such, however, is not the case. Roots attacked by the pests are frequently covered by large warty growths.

The insects' presence above ground is readily told by the woolly material which issues from the dorsal pores. This serves as a shelter for the pests, and especially

American Blight, or Woolly Aphis—*continued.*

stands them in good stead in winter. Woolly Aphides are brown in colour with the exception of the wingless egg-producing, dingy-yellow females, which are produced by the winged females. The eggs are deposited singly in cracks and crevices of the tree; but the insects rely not alone on this means of increasing, for there are individuals which as larvæ live through the winter, and then produce their young alive. It is these which one finds when dressing the trees in winter.

It is not an easy matter to deal with Woolly Aphides except on low-growing trees. The best insecticide in summer is Calvert's Carbolic Soft Soap (1oz. to 1gall. of soft water). This should be made warm, and directed with some force with a garden-engine. Another good recipe is soluble petroleum, 1 wineglassful; water (warm), 1gall.; soft soap, 1lb.; with the addition of a handful of lime. Care must, however, be taken to keep the trees free from extraneous growth like lichen. To prevent this, and also to kill the Aphides, some cultivators spray on (in *winter only*) the following mixture: ½lb. caustic soda (Greenbank's 98 per cent.) and ½lb. crude potash dissolved in 5gall. of water. This must be used with care, or the hands will suffer. Stout gloves should always be used. So much for the tree above ground. For the root-feeders a wash made with the carbolic soft soap above recommended will prove beneficial, first removing the soil. This, too, should be performed in winter. All prunings should be carefully taken away and burnt. *See* also p. 63, Vol. I.

AMERICAN KIDNEY-BEAN TREE. *See* **Wistaria frutescens.**

AMERIMNON. Bentham and Hooker include this under **Dalbergia** (which *see*).

AMETHYSTEA (from *amethystos*, the amethyst; in allusion to the colour of the blossoms). ORD. *Labiatæ*. A monotypic genus. This species, *A. cærulea* (B. M. 2448), is a hardy, erect annual. For culture, *see* **Annuals.**

A. cærula (blue). *fl.* blue, small, cymose; corolla scarcely exceeding the calyx; cymes pedunculate, lax, racemosely panicled. July. *l.* petiolate, three- to five-parted; segments oblong-lanceolate, incised-toothed; floral ones smaller. *h.* 1ft. Temperate Asia, 1759. (B. M. 2448.)

AMIANTHEMUM. Included under **Zygadenus** (which *see*).

AMICIA. This genus embraces four species, natives of the Andes, from Bolivia to Mexico. Flowers yellow, rather large, in short, axillary racemes, rarely solitary; bracts and bracteoles broad. Leaves abruptly pinnate; leaflets usually two pairs, obovate or obcordate, exstipellate; stipules usually large, deciduous.

AMISCHOTOLYPE. A synonym of **Forrestia** (which *see*).

AMMOCHARIS (from *ammos*, sand, and *charis*, love; the species are found in sandy ground). SYN. *Palinetes*. ORD. *Amaryllideæ*. A monotypic genus. The species is a greenhouse, bulbous plant, requiring similar culture to **Brunsvigia** (which *see*).

A. falcata (sickle-shaped). *fl.* bright red, fragrant, twenty to forty in an umbel; perianth funnel-shaped, with a stout, cylindrical tube ¼in. long, and six equal, ascending, oblanceolate-unguiculate segments; peduncle lateral, 6in. to 12in. long. Winter. *l.* bifarious, lorate, spreading, 1ft. to 2ft. long, produced before the flowers. Bulb 6in. to 9in. in diameter. South Africa. SYNS. *Amaryllis coranica* (B. R. 139 and 1219, var. *pallida*), *Brunsvigia falcata*.

AMMODENDRON. *Sophora* is not synonymous with this genus. *S. bifolia* is a synonym of *A. Sieversii*

AMMOGETON. Included under *Troximon*, the correct name of *A. scorzoneræfolium* being **T. glaucum dasycephalum** (which *see*).

AMMOLIRION. A synonym of **Eremurus** (which *see*).

AMMOPHILA ARUNDINACEA. A synonym of **Psamma arenaria** (which *see*).

AMOMUM. About fifty species are included in this genus; they are mostly found in tropical Africa and Asia, but extend as far as Australia and the Pacific Islands. To those described on pp. 64-5, Vol. I., the following should be added:

A. Clusii (Clusius'). *fl.* golden-yellow; lateral lobes spreading, lanceolate-subulate, the dorsal one longer; lip broadly obovate-spathulate, the margins entire; scape radical, few-flowered. December. *l.* linear- or oblong-lanceolate, long-acuminate. Fernando Po. (B. M. 5250.)

A. C. purpureum (purple). The correct name of *A. Danielli.*

A. hemisphæricum (hemispherical). *fl.* green, with the exception of the lip, which is reddish-brown margined with yellow, borne in a dense, globose head; peduncle short, rising from the rootstock among the stems. *l.* distichous, oblong-lanceolate, 1ft. or more in length, 3in. broad. Stems 10ft. to 12ft. high. Japan, 1893. Greenhouse. (B. M. 7592.)

A. magnificum (magnificent). *fl.* deep purplish-red, shorter than the bracts, cylindrical; bracts deep rose-red, narrowly margined with white, the outer ones often reflexed, 3in. to 4in. long; scape 5ft. to 6ft. high, leafless. July and August. *l.* few, oblong, acute. Stems 10ft. to 12ft. high, rigid. Mauritius, 1830. SYN. *Alpinia magnifica* (B. M. 3192).

A. Melegueta minor (lesser). *fl.*, lip orbicular; bracts appressed, convolute. Western Tropical Africa, 1869. Plant smaller than the type in all its parts. (B. M. 5937.)

AMOORA (*Amoor* is the Bengali name). SYNS. *Andersonia, Aphanamixis.* ORD. *Meliaceæ.* A genus embracing about ten species of stove, evergreen, often tall shrubs, natives of tropical and sub-tropical Asia and Australia. Flowers small, polygamo-dicœcious, the males paniculate, the females often spicate or racemose; inflorescence axillary. Leaves imparipinnate. Two species —*A. cucullata* and *A. Rohituka*—have been introduced, but they are probably lost to cultivation.

AMORPHOPHALLUS. Bentham and Hooker include hereunder *Brachyspatha, Conophallus, Corynophallus, Proteinophallus,* and *Tapeinophallus;* but *Brachyspatha* and *Corynophallus* have been kept distinct in Vol. I. This genus comprises about twenty-five species, inhabiting tropical Asia and Africa, the Malayan Archipelago, Australia, and the Pacific Islands.

These curious plants should not be planted out until all danger of severe frost is past. April is usually early enough, and 6in. is none too great a depth at which to insert the roots. *A. Rivieri*, an illustration of which appears in Vol. I., is frequently potted up and used as a room plant; its stout white-spotted scape, rose-marbled leaf stalk, and large leaves, make a very effective whole. Equally decorative are they as foliage plants in the greenhouse.

To those described on p. 65, Vol. I., the following should be added:

A. Afzelii (Afzelius'). A synonym of *Corynophallus Afzelii.*

A. bulbifer (bulb-bearing). *fl.*, spathe dirty green, spotted with rose on the outside, red within but yellowish-green towards the apex, about 5in. long; spadix green and pink; peduncle 10in. to 12in. long. *l.* tripedatisect, bearing tubers at the ramifications of the ribs; primary segments 8in. to 12in. long; petiole 3ft. long. Tuber sub-globose. India. (R. G. 1871, t. 688.) SYN. *Arum bulbiferum* (B. M. 2072, 2503).

A. dubius (doubtful). *fl.*, spathe tube green, 3in. long, the limb ovate, 3in. to 5in. in diameter, waved, the disk dark purple with a green border; spadix 4in. long, the appendage chestnut-brown, 1½in. in diameter; peduncle very short. *l.* one or two, 1ft. to 3ft. broad; segments simple or forked; leaflets oblong, acute. Malabar and Ceylon, 1857. (B. M. 5187.)

A. Eichleri (Eichler's). *fl.*, spathe dirty white, 1½in. high and across, the limb dull reddish-brown, waved and crenate or lobulate; spadix 6in. long, erect; peduncle very short. April. *l.* trisected; divisions shortly petiolulate, 9in. long, the lateral ones bisected, the middle one trisected, the segments pinnatifid; leaflets two or three pairs, sessile, elliptic-ovate, the terminal one 3in. to 4in. long. Western tropical Africa, 1882. (B. M. 7091.)

A. Elliottii (Elliott's). *fl.*, spathe pink and green, with blotches and zones of brownish-purple, short, broad-hooded, with a small aperture; spadix purple, shorter than the spathe; peduncle 1ft. high. *l.* trisected-pinnatifid, 1ft. high. Tuber fleshy. Sierra Leone, 1894. (B. M. 7549.)

Amorphophallus—*continued.*

A. glabra (smooth). *fl.*, spathe olive-green outside, mottled with brown, white within, about 6in. long, rather closely rolled round the spadix in the cylindrical part; spadix shorter, sulphur-yellow, black-dotted; peduncle upwards of 1ft. in height. Queensland. 1895.

A. Lacourii. The correct name is *Pseudodracontium Lacourii.*

A. Leopoldianus (Leopold II.'s). *fl.*, spathe reddish-violet, expanded, shortly pedunculate, the lamina oval-lanceolate, long-acuminate, the margins undulated; spadix 2ft. to 2½ft. long, cylindrical. *l.* horizontally spreading, 2½ft. to 3ft. in diameter, trifariously palmately divided, the divisions bisected; segments oblong-lanceolate, loosely and irregularly bi-tripinnatisect, the ultimate segments 1½in. to 2½in. long; petioles about 1½ft. high, terete, dotted. Congo, 1837. SYN. *Hydrosme Leopoldiana* (I. H. ser. v. 23).

A. Mulleri (Muller's). *fl.*, spathe pale fuscous-yellow and spotted with white outside, yellow within, 10in. long; spadix about 12in. long; peduncle marked with white. *l.* olivaceous, white-spotted, measuring (together with the petioles) 15ft. high; segments variable in shape, undivided or bifid, often dimidiate. Java, 1875. (R. G. 1875, t. 842.)

A. oncophyllus (swollen-leaved). *fl.*, spathe tube whitish, streaked and spotted with green, 3in. long, the limb dull reddish-purple blotched with yellow, 8in. long, 5in. broad; spadix 8in. to 18in. long, the appendage creamy-yellow; peduncle 1ft. to 1½ft. long. *l.* 3½ft. broad; leaflets 6in. to 8in. long; petioles 2ft. to 3ft. long, blotched with greenish-white. Tuber 5in. to 9in. in diameter, bulbilliferous. India, 1893. Odour very disagreeable. (B. M. 7327.)

A. Teuszii (Teusz's). *fl.*, spathe green outside, dark purple-brown within, 6in. long, with a short, ovoid tube, and an open, trifid limb; spadix rather shorter than the spathe, with a greenish, cylindric appendix; peduncle very short. *l.* solitary, tripartite, with bipinnatifid-branched divisions; ultimate segments linear-lanceolate. Western tropical Africa, 1884. SYN. *Hydrosme Teuszii* (R. G. 1142).

A. variabilis (variable). A synonym of *Brachyspatha variabilis.*

A. virosus (venomous). *fl.* fetid; spathe large, green, suffused with purple and with large pale spots outside, lurid-purple within; spadix having a thick, conical, dark purple appendix; peduncle short and thick. *l.* trisected, 6ft. across; segments dichotomously pinnatifid or bipinnatifid; pinnules very unequal; petioles 4ft. high, 3½in. thick. Siam (?). (B. M. 6978.)

A. zeylanicus (Cingalese). A synonym of *Synantherias sylvatica.*

AMPELANUS. A synonym of **Enslenia** (which *see*).

AMPELIDEÆ. A natural order of mostly climbing shrubs, with jointed stems and leaf-opposed tendrils; they are chiefly found in the tropics of both hemispheres, none being indigenous in Europe. Flowers usually green, minute, regular, hermaphrodite or unisexual; petals four or five; stamens opposite the petals; inflorescence paniculately cymose, racemose, or rarely spicate, leaf-opposed. Fruit a berry, often watery, five- or six-celled. Leaves alternate, petiolate, simple or digitately three- to five-foliolate, or pedate, or rarely bipinnate. The Grape Vine (*Vitis vinifera*) is the most important plant of the order; *V. discolor, Vitis (Ampelopsis) quinquefolia* (Virginian Creeper), and *Vitis inconstans (A. tricuspidata,* Veitch's Creeper) are other well-known species in gardens. The *Ampelideæ* number about 250 species, and in the "Genera Plantarum" of Bentham and Hooker are classified in three genera.

AMPELOPSIS. Botanically, this is merely a section of the genus *Vitis.* To the information given on pp. 65-6, Vol. I., the following should be added. *See also* **Ampelovitis.**

A. Hoggi (Dr. Hogg's). This name is given in gardens to the Japanese form of *Rhus Toxicodendron.*

A. muralis (wall-loving). A self-clinging climber, of quick growth, and having brilliantly-coloured leaves.

A. sempervirens (evergreen). A garden synonym of *Vitis striata.*

A. tricuspidata. The correct name is *Vitis inconstans.*

AMPELOVITIS (from *Ampelopsis* and *Vitis*). For culture of the following, *see* **Ampelopsis.**

A. Davidi (David's). *fr.* black, borne in loose bunches. *l.* either simple, lobed, or digitate, shining green above, glabrous and glaucous beneath; petioles short, red, glabrous. North China, 1889. Hardy. (R. H. 1889, p. 204.)

Ampelovitis—*continued.*

A. intermedia (intermediate). *l.* large, coriaceous, varying from cordate and entire to palmately five-lobed; petioles, as well as the stems, beset with stout bristles. 1891. Hardy.

A. Romaneti (Romanet's). A synonym of *Vitis Romaneti.*

AMPELYGONUM. Included under **Polygonum** (which *see*).

AMPHEREPHIS. A synonym of **Centratherum** (which *see*).

AMPHIBESIS. A synonym of **Centratherum** (which *see*).

AMPHIBLEMMA (from *amphi*, both, and *blemma*, the eye; in allusion to the ambiguous character of the flowers). ORD. *Melastomaceæ.* A small genus (three species) of stove herbs or small shrubs, natives of Western tropical Africa. Flowers pink, in simple or branched cymes; calyx-limb dilated, five-toothed; petals five; stamens ten, very unequal. Leaves petiolate, membranous, ovate or ovate-oblong, acuminate, serrulated, five-nerved. Only one species calls for mention here. For culture, *see* **Melastoma.**

A. cymosum (cymose). The correct name of *Melastoma corymbosum.*

AMPHICARPÆA. SYN. *Cryptolobus* (in part). This genus embraces about seven species, natives of North America, Japan, and the Himalayas.

AMPHICOSMIA. Included under **Hemitelia** (which *see*).

AMPHIDONAX. A synonym of **Arundo** (which *see*).

AMPHIGLOTTIS. Included under **Epidendrum** (which *see*).

AMPHILOBIUM. *See* **Amphilophium.**

AMPHISCOPIA. The species formerly classed under this name are now referred to **Dianthera** and **Justicia** (which *see*). *A. Pohliana* is a synonym of *D. Pohliana.*

AMPHITHALEA (from *amphithales*, flowering round the branch). SYN. *Ingenhoussia.* ORD. *Leguminosæ.* A genus embracing nine species of small, Heath-like, greenhouse shrubs, confined to South Africa. Flowers purple or rosy, with the keel darkly tinted, axillary and sub-sessile or crowded in a leafy spike; calyx almost equally five-cleft; standard reflexed; wings oblong. Leaves alternate, simple, entire, sessile, exstipulate. *A. ericæfolia* is the only species that has been introduced, and it is doubtful if that is still in cultivation.

AMPHODUS. Included under *Kennedya. A. ovatus* (B. R. 1101) is synonymous with **K. rubicunda** (which *see*).

AMYGDALEÆ. Included under **Rosaceæ** (which *see*).

AMYGDALOPSIS. Included under *Prunus*, the correct name of *A. Lindleyi* being **P. triloba** (which *see*).

AMYGDALUS. Now included under **Prunus.** *See also* **Persica.** *A. Persica* and *Persica vulgaris* are synonyms of *Prunus Persica.*

AMYRIS ELEMIFERA. A synonym of *A. Plumieri.*

ANABASIS AMMODENDRON. A synonym of **Haloxylon Ammodendron** (which *see*).

ANACAMPSEROS. This genus includes about nine species.

A. arachnoides grandiflora (large-flowered). The correct name of *A. rufescens.*

A. rubens is a variety of *A. arachnoides.*

A. Telephiastrum is the correct name of *A. varians.* SYN. *A. rotundifolia* (L. B. C. 591).

ANACARDIUM. SYNS. *Acajuba, Cassuvium.* This genus includes about half-a-dozen species, natives of tropical America.

A. longifolium (long-leaved). A synonym of *Semecarpus Anacardium.*

ANACHARIS. A synonym of **Elodea** (which *see*).

ANACYCLUS (changed from *Ananthocyclus*, compounded of *a*, privative, *anthos*, a flower, and *kyklos*, a circle; with reference to the circle of ovaries which surrounds the disk.) ORD. *Compositæ.* A genus embracing about ten species of hardy or half-hardy, annual herbs (or with a perennial caudex), inhabiting South Europe, North Africa, and the Orient. Flower-heads radiate, mediocre, pedunculate at the tips of the branches; involucre hemispherical or broadly campanulate, the bracts in few series; receptacle convex or conical; ray florets white, yellow, or purplish, in one series, fertile or sterile, sometimes deficient; disk yellow, fertile; achenes obovate, glabrous, the outer ones two-winged. Leaves alternate, twice or thrice pinnatisect. *A. radiatus purpurascens*, the only plant of the genus in general cultivation, is a very attractive and floriferous, hardy annual, thriving under ordinary treatment.

A. radiatus purpurascens (rayed, purplish). *fl.-heads* large; ray florets white or yellow above, the under-side purplish. Summer. *l.* bipinnatifid, with small, linear segments. 1883. (R. G. 1074.) SYN. *Anthemis purpurascens.*

ANAGALLIS. This genus embraces about a dozen species, inhabiting Europe, North and South Africa, West Asia, and extra-tropical South Africa, one being scattered over nearly all warm and temperate regions; two are indigenous in Britain. To the species and varieties described on pp. 68-9, Vol. I., the following should be added:

A. collina (hill-loving). *fl.* vermilion, purplish at base; corolla large, with rounded-ovate, argutely crenulate lobes; peduncles axillary, longer than the leaves. August. *l.* spreading, amplexicaul, entire; lower ones opposite, lanceolate or ovate-lanceolate, often reflexed; upper ones lanceolate, acute. Stem shrubby at base, ascending. South-west Europe and North Africa, 1803. Nearly allied to *A. linifolia.* SYNS. *A. grandiflora* (A. B. R. 367), *A. fruticosa, A. Wilmoreana* (B. M. 3330).

A. c. alba (white). *fl.* white, yellow in the centre, abundantly produced. April to June. *l.* small, lanceolate. Stems short, erect, crowded, densely set with leaves. 1883. A charming little plant. (R. G. 1125.)

A. fruticosa is a synonym of *A. collina.*

A. grandiflora is a synonym of *A. collina.*

A. latifolia (broad-leaved). The correct name of *A. indica.* (S. B. F. G. 132.)

ANAMENIA. A synonym of **Knowltonia** (which *see*).

ANANAS. According to J. G. Baker, in his monograph of the *Bromeliaceæ*, this genus embraces only three species, natives of tropical America. Sepals ovate, acute, free to the top of the ovary; petals violet or purplish, lingulate, free, much longer than the sepals; stamens much shorter than the petals; peduncle central, its leaves spine-edged. Fruits fleshy, connate with the bracts into a large, ovoid or sub-globose syncarpium, which is often proliferous from the base (the plants can be propagated from the buds thus produced). Two of the descriptions given on p. 69, Vol. I., are here amplified.

A. bracteatus (prominently bracteate). *fl.*, petals violet; inflorescence a dense, oblong strobilus 4in. to 6in. long; bracts bright red; peduncle 1ft. to 2ft. long, its leaves bright red. April. *fr.*, syncarpium ovoid, yellow when ripe, with a large tuft. *l.* thirty to fifty in a rosette, ensiform, 4ft. to 5ft. long. Brazil (introduced from Portugal in 1820). (B. M. 5025; B. R. 1081.) SYN. *Ananassa bracteata.*

A. crocophylla (Saffron-leaved). A synonym of *Æchmea crocophylla.*

A. macrodontes. The correct name of the plant described as *A. macrodonta.* (B. H. 1878, p. 140, tt. 4, 5.)

A. Mensdorfianus (Mensdorf's). A synonym of *Æchmea Fernandæ.*

A. sativus (cultivated). Pine-apple. *fl.* about 1in. long; inflorescence an ovoid cone 3in. to 6in. long; peduncle stiffly erect, ½in. to 1in. long. April. *fr.*, syncarpium ovoid, 6in. to 12in.

Ananas—*continued.*

long (under cultivation), crowned with a tuft of twenty to thirty leaf-like, empty bracts. *l.* thirty to fifty in a dense rosette, ensiform, 3ft. to 5ft. long, 1½in. to 2in. broad. Tropical America, 1690. There are numerous varieties, including *bracamorensis, debilis, glaber, lucidus, microcephalus, Mordilona, Porteanus,* and *variegatus.* *See* **Pine-apple.**

ANANTHERIX. This is now included under **Gomphocarpus** (which *see*).

ANANTHOPUS. A synonym of **Commelina** (which *see*).

ANARSIA LINEATELLA. *See* **Peach Insect Pests.**

ANAPHALIS (said by De Candolle to be an ancient Greek name of some Gnaphalioid plant, and that it may be taken as an anagram of the very similar genus *Gnaphalium*). Everlasting. SYN. *Antennaria* (in part). ORD. *Compositæ.* This genus comprises about twenty-five species of greenhouse or hardy, erect, perennial herbs, mostly natives of tropical and temperate Asia, one (*A. margaritacea*) being broadly dispersed over North America and Eastern Asia, and also occurring in Europe. Flower-heads rather small, crowded at the tips of the branches or loosely corymbose, heterogamous or unisexual; involucre campanulate, the bracts in many series, often white; receptacle flat or convex. Leaves alternate, entire, petiolate, sessile, or decurrent. Only three species call for mention here. For culture, *see* **Antennaria.**

A. margaritacea (pearly). Pearl Cudweed; Pearly Everlasting. The correct name of *Antennaria margaritacea.*

A. Royleana (Royle's). *fl.-heads* white, ¼in. to ⅓in. in diameter, disposed in rounded corymbs; involucral bracts also white. September. *l.* sessile, ⅜in. to 1½in. long, linear or linear-oblong, obtuse or acute, woolly beneath or on both surfaces, one-nerved, flat or having recurved margins. Stems many, 4in. to 6in. high. Alpine Himalayas, 1832. Hardy.

A. triplinervis (triple-nerved). The correct name of *Antennaria triplinervis.*

ANBURY. *See* **Finger and Toes.**

ANCHOMANES. This genus embraces one or two species, natives of Western tropical Africa. Flowers monœcious, on an inappendiculate spadix; spathe marcescent, open, erect, cymbiform or lanceolate, fleshy, convolute towards the base. Leaves solitary. To the species described on p. 70, Vol. I., the following should be added:

A. dubius (doubtful). *fl.*, spathe purplish outside, cream-coloured within, elongated-oblong-lanceolate; spadix one-fourth shorter than the spathe. *l.* very large, sparsely prickly; primary segments dichotomous; secondary ones pinnatifid or pinnatisect. Rhizome tuberous, oval or oblong. Africa. (G. C. 1885, xiii., p. 669.)

ANCHUSA. SYN. *Buglossum.* This genus embraces about thirty species, natives of Europe, North and South Africa, and Western Asia, one or two of them being also found in other regions (two in Britain). The one usually grown is *A. italica,* a hardy perennial of great value in the border on account of its intense blue flowers; while to beekeepers it has an additional charm. In the wild garden, again, it is very effective, and should always find a place. To the species, &c., described on p. 71, Vol. I., the following should be added:

A. affinis (related). *fl.* blue, like Forget-me-nots, funnel-shaped above, ¼in. to ⅓in. long; racemes short, disposed in a narrow, terminal panicle. Summer. *l.* oblong, entire, slightly obtuse; radical ones 5in. long; cauline ones sessile, 1½in. long. Stem 8in. to 9in. long. Abyssinia, 1895. Perennial.

A. angustifolia (narrow-leaved). A form of *A. officinalis.*

A. hybrida (hybrid). *fl.* purple, with the processes of the throat white; raceme spike-like, at first compact, eventually elongated. June to August. *l.* oblong-lanceolate, sinuate-toothed, slightly undulated. *h.* 1ft. to 1½ft. Italy, 1820. Annual.

A. ochroleuca (yellowish-white). *fl.* yellowish-white; corolla tube as long as the calyx; bracts linear-lanceolate. July and August. *l.* lanceolate, hispid-ciliated, minutely strigillose. Stems erect, minutely villous. *h.* 2ft. Caucasus, &c. Perennial. (B. M. 1603.) The varieties *cærulescens* and *leptophylla* have bluish flowers.

Anchusa—*continued.*

A. officinalis angustifolia (narrow-leaved). *fl.* in a looser spike than in the type. May. *l.* narrower-lanceolate. *h.* 2ft. South Europe, 1640. (B. M. 1897, under name of *A. angustifolia*).

A. tinctoria. The correct name is *Alkanna tinctoria.*

ANCHUSOPSIS. A synonym of **Lindelofia** (which *see*).

ANCISTROPHYLLUM (from *agkistron,* a grapple-hook, and *phyllon,* a leaf; in allusion to the habit of the plants). ORD. *Palmæ.* A small genus (three or four species) of tufted, tall-climbing, stove Palms, natives of Western Africa. Flowers hermaphrodite, mediocre; spadix pyramidal, 4ft. to 6ft. long, distichous, doubly-branched, the branches pendulous; spathes tubular, sheathing. Fruit small, ovoid-globose, one-seeded. Leaves remote, alternate, equally pinnatisect; segments somewhat aggregated or alternate, linear-lanceolate or oblong-falcate. For culture of the species introduced, *see* **Calamus.**

A. læve (smooth). *fl.* alternately distichous, much-spreading, twin; spadix terminal, ovate, 1½ft. to 2ft. high, with six to eight primary branches. *l.* 4ft. to 5ft. long; segments nine to thirteen on both sides, broadly lanceolate-elliptic, narrowed towards the base, acuminate at apex, slightly falcate, unarmed; petioles 8in. to 9in. long. Stem 30ft. to 40ft. long, as thick as a finger, unarmed. Gaboon, &c. SYN. *Calamus lævis* (T. L. S. xxiv., p. 430, pl. 38B).

A. secundiflorum (side-flowering). *fl.* twin; spadix terminal, broadly ovate, 4ft. to 6ft. high; primary branches ten to fifteen, about 3ft. long. *l.* 12ft. to 14ft. long, long-sheathing, shortly petiolate, about 1ft. to 1½ft. apart; segments forty-five to fifty-five on both sides, linear-lanceolate, ciliate-aculeate on the margins. Stem about 1½in. thick, 50ft. to 60ft. long, unarmed. Sierra Leone, &c. SYN. *Calamus secundiflorus* (T. L. S. xxiv., p. 432, pl. 33, 41, 42).

ANCISTRUM. A synonym of **Acæna** (which *see*).

ANDERSONIA. This genus includes about nineteen species, all natives of South-western Australia. Leaves with a shortly-sheathing, often membranous base, the upper ones passing into floral leaves or bracts. To the species described on p. 71, Vol. I., the following should be added:

A. cærulea (blue). *fl.* singly terminating short peduncles or branchlets, usually crowded in a spike-like panicle; sepals pink, about ¼in. long; corolla blue, shorter than the calyx. *l.* from a broad base tapering into a long point, undulated or twisted, pubescent when young; those on the main stems ¼in. long. *h.* 1ft. to 2ft. Plant erect. (R. G. 1180, f. 2.)

A. depressa (depressed). *fl.* solitary at the ends of the branchlets; sepals greenish-white, ⅛in. to ¼in. long, glabrous or hairy; corolla blue, shorter than the calyx. *l.* with a short, broad base, subulate-acuminate, spreading, often twisted, ¼in. to ½in. long. *h.* 6in. to 12in. Plant prostrate or diffuse. (R. G. 1180, f. 1.)

A. homalostoma (flat-mouthed). *fl.* small, in dense, terminal globular heads or oblong spikes, sometimes 1in. long; sepals pink; corolla blue. *l.* spreading and sometimes squarrose, acuminate, straight or twisted, rarely above ¼in. long. *h.* about 1ft., or low and diffuse. (R. G. 1180, f. 3.)

ANDERSONIA (of Roxburgh). A synonym of **Amoora** (which *see*).

ANDREUSIA. A synonym of **Myoporum** (which *see*).

ANDRICUS TERMINALIS and **A. CURVATOR.** These are two of the commonest Galls found upon the oak. The former is the well-known Oak Apple associated with the 29th of May; and the latter, the green globular swelling, about the size of a pea, found in late spring on both sides of the leaves. It is on account of this curling of the leaves that the specific name of *curvator* has been applied. *See* under **Galls** and **Oak Galls.**

ANDROLEPIS is included by J. G. Baker under **Æchmea** (which *see*), the species retaining its specific name *Skinneri.*

ANDROMACHIA. A synonym of **Liabum** (which see).

ANDROMEDA. *See also* **Agarista, Agauria,** and **Enkianthus.**

ANDROMYCIA (name not explained by its author). ORD. *Aroideæ*. A monotypic genus. The species, *A. cubensis*, is the plant described on p. 223, Vol. IV., as *Xanthosoma helleborifolium*.

ANDROSACE. Rock Jasmine. This genus embraces about forty species, confined to the Northern hemisphere. They are alpines of the first water, and in addition to their Primula-like flowers the perennials have neat evergreen (often woolly) foliage to recommend them. Their culture, however, should never be attempted in towns. Once they are established they should remain undisturbed, as they very quickly resent interference. To those described on pp. 72-3, Vol. I., the following should be added:

A. albana (Albanian). *fl.* pinkish, crowded in sub-sessile umbels; scape erect, three or four times the length of the leaves. April to July. *l.* forming small rosettes, lanceolate-spathulate, obtuse, glabrous, deeply toothed, sessile. Eastern Caucasus, 1892.

A. alismoides (Alisma-like). A synonym of *A. lactiflora*.

A. britanica (British). *fl.* white. *h.* 2in. 1890. A hardy alpine, raised by Messrs. Backhouse, of York.

A. caucasica (Caucasian). *fl.* bright pink, produced in clusters, almost stemless. Summer. *l.* narrow, toothed, forming dense rosettes. Caucasus, 1892. A pretty species.

A. cylindrica (cylindrical). *fl.* pure white, solitary; peduncles pilose, longer than the leaves. *l.* densely imbricated, lanceolate-ovate, very obtuse, ⅛in. long, pilose, persistent and reflexed when old. Stems branched. Pyrenees, 1890. Plant tufted.

A. foliosa (leafy). *fl.* many in an umbel; corolla pale flesh-coloured, ⅛in. to ¼in. in diameter; scape solitary, erect, 3in. to 5in. high. May to September. *l.* 2in. to 3in. long, elliptic or elliptic-oblong, obtuse or acute, hairy. Rootstock woody, without stolons, sending up one or more very short stems. Western Himalayas, 1882. (B. M. 6661.)

A. lactiflora (milk-flowered). *fl.* white or blue; calyx urceolate-campanulate; corolla lobes cuneate-ovate, emarginate; scape erect, many-flowered. August. *l.* rosulate, linear-lanceolate, acute; petioles winged. Stem wanting. Siberia, 1806. Biennial. SYN. *A. alismoides*.

A. lanuginosa Leichtlini (Leichtlin's). *fl.* white, with a yellow eye. 1890.

A. macrantha (large-flowered). *fl.* pure white, borne in strong spikes. *l.* produced in rosettes and horned near the tip. Armenia, 1897. A distinct species, belonging to the *coronopifolia* group.

A. Raddiana (Raddi's). *fl.* rose-coloured. *l.* toothed, produced in rosettes. Caucasus, 1897. A pretty, biennial species.

A. rotundifolia macrocalyx (round-leaved, large-calyxed). *fl.* numerous; calyx ¼in. to ⅜in. in diameter; corolla pale rose-coloured, much shorter than the calyx; scapes slender, longer than the leaves. June. *l.* radical, 1in. to 2in. in diameter, orbicular-cordate, lobulate; petioles equalling the blades. Himalayas, 1796. A softly hairy perennial, without stolons. (B. M. 6617.)

A. sarmentosa Chumbyi (Chumby's). From the species this differs chiefly in having very short flower-stalks. It is a gem for the alpine garden.

A. sempervivoides (Sempervivum-like). *fl.* bright purple, in glandular-pubescent umbels; corolla lobes obovate, with rounded tips; scape solitary, 1in. to 3in. long, stout. May and June. *l.* tiny, in a dense rosette ¼in. in diameter, obovate-spathulate, ciliated, curled up so as to resemble a cone. Stolons 1in. to 1½in. long. Western Thibet, 1893. A remarkable species.

A. Vitaliana. The correct name is *Douglasia Vitaliana*.

A. Wulfeniana. This is regarded as a variety of *A. alpina*, with leaves less pubescent than in the type.

ANDRYALA. SYN. *Forneum*. There are about a dozen species, natives of the Mediterranean region, North-west Africa, &c. Flower-heads yellow, homogamous, terminal, on long peduncles; inner involucral bracts in one or two series, the outer ones few and short. Leaves alternate, entire, sinuate-toothed, or pinnatifid.

ANECOCHILUS. A synonym of **Anœctochilus** (which *see*).

ANEILEMA. *Anilema* (of Kunth) and *Aphylax* are synonymous with this genus, which embraces nearly sixty species dispersed over the warmer regions of the globe.

ANEIMIA. *See* **Anemia.**

ANEMAGROSTIS. A synonym of **Apera** (which *see*).

ANEMIA. Including *Coptophyllum*. Owing to the fertile segments being always wholly contracted and having the appearance of flowering spikes, the plants of this genus are popularly known as "Flowering Ferns."

Although many very interesting species have at different times been introduced, comparatively few have survived the effects of the treatment first received after their importation; yet, provided heat and plenty of light are at the disposal of the cultivator, they are not difficult to manage. Anemias will be found to thrive best in a mixture of two parts good fibrous peat, one part leaf mould, and one part sharp coarse silver sand, the plants being kept on a shelf if in a spacious house, or near the glass if in a warm pit or low house. Watering overhead is very injurious to all of them. They prefer being grown in small pots to being planted out in the Fernery, and although they are not what may be thought the ideal of decorative Ferns, as they cannot be used for general purposes on account of their vegetation being too slow, still, when grouped together or used in conjunction with other Ferns of dwarf habit or of medium size, they present a very striking appearance.

Anemias are usually propagated from spores, which germinate very freely, though some species of a naturally tufted habit may be increased by division of their crowns, an operation which should be performed between the middle of March and the end of April.

To the species described on pp. 73-4, Vol. I., the following should be added:

A. cheilanthoides (Cheilanthes-like). A popular name for *A. tomentosa*.

FIG. 39. ANEMIA COLLINA.

A. collina. This is a very distinct species, by reason of the rusty-coloured hairs which clothe the firm, upright stalks, as in Fig. 39.

A. Dregeana is a South African species, illustrated at Fig. 40.

Anemia—*continued.*

FIG. 40. ANEMIA DREGEANA.

A. fraxinifolia (Ash-leaved). A variety of *A. Phyllitidis.*

A. Gardneri (Gardner's). *sti.* firm, upright, naked, 3in. to 4in. long. *fronds* coriaceous; rachis and both surfaces naked; barren portion 4in. long, 2½in. broad, formed of four pairs of imbricated pinnæ, the lowest of which are about 1in. broad, all being borne on short footstalks and conspicuously toothed; panicle about 2in. long; peduncle about the same length. South Brazil. Stove. SYN. *A. Glaziovii.*

A. Glaziovii (Glaziou's). A garden synonym of *A. Gardneri.*

A. rotundifolia (round-leaved). *sti.* slender, erect, 6in. to 9in. long, hairy when young. *fronds*, barren portion 8in. to 12in. long, 1in. to 2in. broad, often prolonged and rooting at the extremity; pinnæ eight to twelve pairs, distantly placed, 1in. long, ¾in. broad, very obtuse, the lower side obliquely truncate at base, the outer edge finely toothed; surfaces and rachises finely hairy; panicle 2in. to 3in. long; peduncle 3in. to 4in. long, slender. South Brazil. Stove.

FIG. 41. ANEMIA TOMENTOSA.

A. tomentosa. This pretty, tropical American species is illustrated in Fig. 41.

ANEMIA (of Nuttall). A synonym of **Houttuynia** (which *see*).

ANEMIOPSIS. A synonym of **Houttuynia** (which *see*).

ANEMONE. Including *Hepatica* and *Pulsatilla.* Of the seventy species comprised in this genus, the great majority inhabit the temperate, frigid, or mountainous regions of the Northern hemisphere; a few are found in South America and South Africa, and one is a native of Australia.

Florists have made great strides with Anemones, and the various strains now upon the market are not a little bewildering to those who wish to take up these charming, hardy flowers. Most improvement is noticeable in the spring flowering kinds, for which there is great demand alike by the garden-loving public and those who grow for market. Even this section is not restricted to spring, for by planting successional batches the season may be prolonged considerably. The autumn-flowering section has also been added to, several varieties of good substance being the result.

Varieties of *A. coronaria*, both single and double, are now very numerous, the most distinct being the Double Chrysanthemum-Flowered kinds. These have beautifully imbricated petals, and remind one forcibly of the Chrysanthemum-Flowered Asters. Then there are the Great French Poppy Anemones, found in a beautiful range of colours; and the very free-flowering strain, known as the

FIG. 42. ST. BRIGID ANEMONES.

St. Brigid Anemones (see Fig. 42) which are characterised by large, mostly semi-double flowers. Seed from these last should be sown in boxes in early spring, and transplanted as soon as they are large enough. By sowing at intervals these charming flowers may be had over a long season. Cutting winds in spring are very damaging to Anemones, and this should be borne in mind when planting.

A. fulgens has now several well-marked varieties—*flore-pleno*, *græca*, and *Leichtlinii*, being the most noteworthy. This species is still one of the most brilliant of early flowers and may be had in blossom in January. For this the roots would need to be planted in autumn. A second display could be obtained by planting a further batch in spring. It must be remembered that a somewhat shaded position must be assigned these plants, more particularly those required to flower in summer. *A. fulgens*, providing it has a suitable warm soil, which

Anemone—*continued.*

it should if it is to be successfully grown, should not be disturbed very often. They may also be grown as pot subjects. Of the pretty Wood Anemone (*A. nemorosa*), there is a most useful double form. These are shade-lovers, and may be grown under trees.

The additions to the Japanese or autumn-flowering section are not numerous, the most meritorious being Lady Ardilaun, an exquisite white with a double series of petals; and Whirlwind, another semi-double, with leafy bracts. One of the most remarkable in this section is a variety with beautifully crispated foliage. These Anemones, as stated in Vol. I., are readily propagated by division of the roots. This should be undertaken in November. Nearly every portion may be relied upon to produce a good plant the next season. Plenty of water is necessary during very dry weather; or, what is still better, a mulching about the roots.

Of the host of species none are more esteemed than *A. blanda* and *A. apennina*, both of which are blue. These are amongst the easiest to increase—the former by seed as well as by division, and the latter by division.

To those described on pp. 74-8, Vol. I., the following should be added:

A. baikalensis (Baikal). *fl.* snow-white inside, suffused rose-pink outside. May to July. *h.* 9in. to 15in. Allied to *A. sylvestris.*

A. blanda scythinica (Scythian). A variety having pale blue and white flowers. Northern Kurdistan, 1895.

A. caffra (Kaffir). *fl.* rosy-white, 1½in. in diameter; sepals twelve to eighteen, sparsely silky or glabrescent; peduncle one-flowered, villous below, densely woolly above the involucre. *l.* several from the woody rootstock, rigid, glabrescent, five- to seven-lobed, the lobes biserrate; petioles 3in. to 4in. long. South Africa, 1890.

A. Eunrenia (Eunrenia). This plant, introduced into European gardens from Persia in 1894, is probably a form of *A. coronaria* or *A. hortensis.*

A. Fanninii (Fannin's).* *fl.* pure white, fragrant, 3in. to 4in. in diameter; sepals twelve to thirty, linear-lanceolate, acuminate; pedicels 8in. to 10in. long or more; scape hairy, 2ft. to 5ft. high. June. *l.* sub-orbicular, 3in. to 2ft. in diameter, coriaceous, five- to seven-lobed, velvety above, villous beneath, the lobes toothed; petioles hairy, 1ft. to 2ft. long. South Africa. A giant Anemone. (B. M. 6958; G. C. n. s., xxv., p. 433.)

FIG. 43. ANEMONE PALMATA.

A. fragifera (Strawberry-bearing). A synonym of *A. baldensis.*

A. Hepatica is a European, but not an English, plant.

A. palmata. This charming rock plant, whose yellow flowers are well known, is illustrated at Fig. 43.

A. polyanthes (many-flowered). *fl.* white, 1in. to 2in. in diameter, in simple or compound umbels, often very numerous; sepals broadly obovate or oblong. May. *l.* 2in. to 4in. in diameter, orbicular-cordate, five- to seven-lobed, but rarely below the middle; lobes coarsely and irregularly crenate; petioles very stout, 4in. to 10in. long. *h.* 1ft. to 1½ft. Himalayas. (B. M. 6840.)

A. stellata fulgens (shining). A variety differing from the type in its vermilion-scarlet flowers.

A. sulphurea (sulphur-coloured). The correct name of *A. alpina sulphurea*, which is a good species.

A. thalictroides (Thalictrum-like). A synonym of *Thalictrum anemonoides.*

ANEMONE, RUE. *See* **Thalictrum anemonoides.**

ANEMOPÆGMA. About a score species, natives of Brazil, Guiana, and Colombia, have been enumerated. Flowers white, yellow, or rarely purplish, usually racemose; calyx truncate or minutely five-toothed; corolla sub-bilabiate, the five lobes rounded or emarginate; stamens four, didynamous; leaves opposite, three- to five-foliolate; leaflets entire, the terminal one often changed to a tendril or wanting. *A. racemosum* and *A. carrerense* are the only species known in gardens.

A. carrerense (Carrera). *fl.* pale citron yellow; corolla tube 6in. long; inflorescence three- to six-flowered; peduncles about 2½in. long. April to September. *l.* opposite; leaflets two, ovate, 2½in. long, glabrous. Branches terete, striated, sparsely pubescent. *h.* 5ft. to 6ft. Island of Carrera, Trinidad, 1898. Closely allied to *A. racemosa.*

A. clematideum (Clematis-like). A synonym of *Pithecoctenium clematideum.*

ANEMONOPSIS. *Xaveria* is synonymous with this genus.

ANETHUM. Now included under **Peucedanum.**

ANETIUM. Included under **Hemionitis.**

ANGELANDRA. A synonym of **Engelmannia.**

ANGELONIA. SYNS. *Physidium* and *Thylacantha.* Twenty-two species, natives of tropical America (mostly Brazilian), are included in this genus. *A. cornigera* and *A. Gardneri* are the correct names of the two species described under **Physidium.**

A. pubescens (downy). A garden name for *A. Gardneri.*

ANGELS' EYES. *See* **Veronica Chamædrys.**

ANGIANTHUS (from *aggeion*, a vase, and *anthos*, a flower; in reference to the inflorescence). ORD. *Compositæ.* A genus embracing twenty-two species of greenhouse, annual or perennial, Australian herbs. Flower-heads numerous, in a dense cluster, spike, or compound head. *A. pusillus* has been introduced, but it is of no horticultural value.

A. aureus (golden). A garden name for *Cassinia aurea.*

ANGIOPTERIS. All *Angiopteris* are exceedingly useful for adorning the warm Fernery the year round, and the cool Fernery during summer. Whether grown in pots or planted out, they should be kept in a mixture of two parts fibrous loam, two parts rough peat, one part chopped sphagnum, and one part coarse sand: in this they thrive luxuriantly, provided that at all times they receive a liberal supply of water at the roots and are allowed plenty of room to fully expand their gigantic foliage. When they are grown in pots, a similar mixture should be used, but it is a good plan to keep the pots in water to the depth of 2in. or 3in.

Although spores of *Angiopteris* are frequently and freely produced, there is no record of any seedlings of these noble Ferns having been raised in England, or, indeed, in any other European country. The propagation of these plants is usually left to their natural disposition of frequently producing at the base of their fronds young plants, which, when sufficiently developed, may be detached without trouble. The most expeditious way of increasing Angiopteris, however, is by means of the scaly appendages with which the base of each frond is surrounded. Each of these fleshy scales contains at least two dormant buds, which, under the influence of heat and constant moisture, soon develop. The scales should be detached in their entirety and not be cut up, then laid in silver sand, covered with chopped sphagnum, and kept in a close propagating-case. Though this may be done at almost any season, February and March are the times most appropriate to such a mode of propagation, which always proves all the more rapid when done early in the spring. According to the season in which this operation is performed, it is known that from three to five months usually elapse before the first indications of growth may be noticed; but after they have made a decided start, these young bulbils rapidly gain in strength, and may soon be considered as so many independent subjects.

Angiopteris—*continued.*

A. evecta. This handsome Fern—the only species recognised by botanists—is found all over the tropics of the Old World, and is very common in sub-alpine jungles on the west side of the Madras Presidency. See Fig. 44.

ANGRÆCUM. SYN. *Ærobion.* Including *Listrostachys.* The species of this genus number about forty, and are nearly all natives of tropical or South Africa and the Mascarene Islands.

FIG. 44. ANGIOPTERIS EVECTA.

FIG. 45. ANGRÆCUM SESQUIPEDALE.

With the exceptions of *A. eburneum* and *A. sesquipedale* (see Fig. 45), all the members of this great genus that are in cultivation are of dwarf habit, and are suitable for basket or shallow-pan culture suspended near the roof-glass. *A. Scottianum* should be placed in a basket, and the terete stems wound around a block stood in the centre, the block having been previously covered with living sphagnum. The potting compost required by the other members of this genus is a layer of good sphagnum, made moderately firm at the top of the basket or pan, the remaining portion having been previously filled with clean broken crocks. Angræcums delight in a liberal amount of moisture at all seasons of the year, both in the atmosphere and at the roots.

To the species described on p. 79, Vol. I., the following should be added:

A. apiculatum (apiculate). A synonym of *A. bilobum.*

A. articulatum (jointed). *fl.* creamy-white, racemose, polymorphous, the filiform spur as long, or sometimes three times as long, as the ovary; peduncles stout. *l.* cuneate-oblong, unequally bilobed, about 6in. long. Madagascar. A dwarf species, allied to *A. bilobum.* (R. ser. i., t. 55.)

A. avicularium. *fl.* snow-white; sepals and petals lanceolate, cuspidate; lip narrow at the base, oblong, cuspidate; spur filiform, 4in. to 5in. long; peduncle more than 9in. high, bearing fifteen flowers. *l.* short and broad, cuneate-oblong-elliptic, bilobed at the point, nearly 4in. long. Probably a native of tropical Africa, 1887.

A. bilobum Dormanianum (Dorman's). A small-flowered variety, having vermilion-flaked ovaries, and vermilion tips to the sepals. 1885.

A. b. Kirkii (Sir John Kirk's). *fl.* pure white, having slender, pale brown spurs 2½in. to 3in. long; racemes drooping. *l.* narrower than in the type, ending in two divergent lobes. Zanzibar, 1882. (W. O. A. iv. 162.)

A. bistortum (twice-twisted). This species is closely allied to *A. arcuatum*, but has much smaller flowers, which are peculiar in being furnished with a loop-curved spur. Western tropical Africa, 1893. SYN. *Listrostachys bistorta.*

A. calligerum (callus-bearing). *fl.* very stiff in texture; sepals ligulate, acute, with a strong, semi-oblong callus on the keel at the very base; petals cuneate-oblong, acute; lip's plate rather ligulate, pandurate, acute, with a long, filiform, acute spur, exceeding the stalked ovary six to seven lines. *l.* slightly glaucous, ligulate, bilobed. 1887.

Angræcum—*continued.*

A. crenatum (crenate). *fl.* resembling those of *A. Chailluanum* in colour and shape, but much smaller (as is also the habit of growth). June and July. West Africa. A rare and distinct species.

A. cryptodon (hidden-toothed). *fl.* white, 1½in. across, in loose racemes; petals ligulate, acute; lip lanceolate; spur reddish at base, thrice as long as the reddish-white ovaries. *l.* three or four, obovate-oblong, 3in. long. Madagascar, 1882.

A. descendens (descending). *fl.* white; lip cuneate-ovate, acuminate; column hairy, shorter than in *A. Ellisii* (to which this fine species is related); spur stronger, more than four times exceeding the pedicels; raceme drooping, many-flowered. *l.* oblong-ligulate, obscurely bilobed at apex. Said to come from Madagascar, 1882.

A. Eichlerianum (Eichler's). *fl.* large, solitary; sepals and petals light green, lanceolate; lip white, large, obcordate, with a triangular apiculus in the notch; spur erect, conical, about as long as the sepals. *l.* distant, oblique, elliptic, obtuse. Stems tall, leafy. Loango, West Africa, 1883

FIG. 46. ANGRÆCUM ELLISII.

A. Ellisii.* The pure white, sweetly-scented blossoms of this dwarf, winter-flowering species are well shown in Fig. 46.

A. fastuosum (proud). *fl.* ivory-white, scented like Tuberoses, numerous, racemose; sepals and petals ligulate-oblong; lip obovate; spur filiform, 2in. to 3in. long. *l.* cuneate-oblong, 3in. broad, blunt and unequally lobed at apex, wrinkled, the margins cartilaginous. Madagascar. (B. M. 7204; G. C. 1885, xxiii., p. 533.)

A. florulentum (dark-flowered). *fl.* one to three in a raceme; sepals lanceolate; petals broader than the sepals; lip oblong-lanceolate, apiculate; spur filiform, one-third longer than the ovary; racemes numerous. *l.* lanceolate, bilobed, 3in. long. Stem zigzag. Comoro Islands, 1885.

A. Fournieræ (Mme. Fournier's). A synonym of *A. stylosum.*

A. Fournierianum (Fournier's). *fl.* resembling those of *A. Eichlerianum*, but pure white and larger (2in. across), the point

Angræcum—*continued.*

of the lip being protracted into a long, acute tongue; raceme long, many-flowered. *l.* 2ft. long, 1½in. to 2in. broad, very fleshy. Madagascar, 1894. (G. C. 1894, xvi., p. 43, f. 7.)

A. fragrans (fragrant). *fl.* pure white, fragrant, 2in. across the sepals, solitary, axillary or supra-axillary; lip about as long as the sepals, hastately lanceolate, acute, grooved down the centre; peduncle and ovary 2½in. long. *l.* few, towards the top of the stem, 3in. to 4in. long, ½in. to ¾in. broad, deeply two-lobed at the tip. Stem 6in. to 10in. long, climbing. Bourbon and Mauritius, 1887. (B. M. 7161.)

A. funale (cord-like). A synonym of *Dendrophylax funalis.*

A. fuscatum (fuscous). *fl.* numerous, in a thin, lax raceme; sepals ochreous, the lateral ones reflexed; petals broader than the sepals; lip white, oblong, acuminate; spur brown, long, filiform, flexuous. *l.* cuneate-oblong, unequally bilobed. Madagascar, 1883. The habit of this plant is much in the way of *A. bilobum.* (R. G. 1234; R. H. 1887, p. 42.)

A. Germinyanum (Comte Adrien de Germiny's).* *fl.* pure white, solitary, on axillary peduncles; sepals and petals long, subulate; lip broad, suddenly contracted in the middle into a filiform, reflexed tail, 1in. long; spur greenish-white, 3in. long. *l.* linear-oblong, 2in. to 3in. long, sessile, unequally bilobed at apex. Stem climbing, 1ft. to 1½ft. long. Madagascar, 1888. (B. M. 7061.)

A. Grandidierianum (Grandidier's). *fl.* ivory-white, about the same size as those of *A. Chailluanum;* sepals cuneate-oblong, acute; petals spathulate, apiculate; lip cordate-pandurate or cordate-oblong, blunt, with a long, filiform spur; raceme one- to three-flowered. *l.* thick, oblong, obtuse and unequally two-lobed at apex. Comoro Islands, 1887. (R. H. 1887, p. 42.) SYN. *Aëranthus Grandidierianus.*

A. Henriquesianum (Henriques'). This is closely allied to *A. bilobum*, but is smaller in all its parts. St. Thomas' Island, 1890.

A. Hildebrandtii (Hildebrandt's). *fl.* orange-yellow; lip oblong, acute; spur filiform, clavate, shorter than the ovary. *l.* ligulate, unequally bilobed. Comoro Islands. An elegant but small-growing plant.

A. Humblotii (Leon Humblot's).* *fl.* ivory-white, comparable to those of *A. sesquipedale*, but having a much shorter spur, which is funnel-shaped at the base, then filiform and bent abruptly upwards. *l.* numerous, sword-like, stout, falcate, 8in. to 9in. long. Comoro Islands, 1885. A grand plant. SYN. *Aëranthus Leonis* (G. C. n. s., xxiv., pp. 80-81; R. 70; W. O. A. 213).

A. hyaloides (crystal-like). *fl.* of a transparent white, small, distichous and alternate, on short pedicels; sepals, petals, and lip similar, oval-oblong, acute; racemes ten- to fifteen-flowered. *l.* five to seven, oval-oblong, spreading, obtuse or two-lobed at apex. Stems about 1in. high. Madagascar, 1879. A tiny plant.

A. ichneumoneum (ichneumon-like). *fl.* loosely arranged on a long axis; sepals and petals dirty ochre-white, ligulate, with a curious spur. *l.* ligulate, dark green, 1ft. long, 2in. broad, unequal at apex. Western tropical Africa, 1887.

A. imbricatum (imbricated) *fl.* sweet-scented, in cluster-like racemes; sepals and petals creamy-white, lanceolate; lip orange and yellow, flabellate, retuse, apiculate, convulute, the spur recurved, blunt, not half as long as the blade of the lip, which it nearly touches. *l.* leathery, cuneate-oblong, bluntly bilobed. Stem tall, strong. 1887. SYN. *Saccolabium Barbeyæ.*

A. Kimballiana (Kimball's). A garden name for *Æonia polystachya.*

A. Leonis (Leon Humblot's). A. synonym of *A. Humblotii.*

A. Mooreanum (Moore's). This is described as "a pretty little species, with salmon-coloured flowers." 1897.

A. Obrienianum (O'Brien's). *fl.* greenish-white, with a long spur. *l.* thick. 1893. Allied to *A. Chailluanum.*

A. ophioplectron (snake-spurred). *fl.*, sepals and petals greenish-yellow, narrow, acuminate; lip white, triangular, acuminate, with an ochre-reddish, filiform spur four times as long as itself. Madagascar, 1888. SYN. *Aëranthus ophioplectron.*

A. pachyurum (thick-tailed). *fl.*, sepals and petals ½in. long; lip ½in. long, elliptic, apiculate; spur curved, 2½in. to 3in. long; racemes pendulous, 6in. to 9in. long, many-flowered. *l.* sub-spathulate, oblong, bilobed, 3in. to 3½in. long. Stems short. British Central Africa, 1891.

A. pallidum (pale). *fl.* white, disposed in numerous long spikes. *l.* 2ft. long. West Africa, 1890. Allied to *A. pellucidum.*

A. polystachyum (many-spiked). A synonym of *Æonia polystachya.*

A. porrigens (extended). *fl.* creamy-white. 1894. SYN. *Listrostachys porrigens.*

A. primulinum (Primrose-like). Probably a natural hybrid between *A. hyaloides* and *A. citratum*, with the characters of the latter predominating, except in the spur, which is lin. long, twice sharply bent, and pendulous. Madagascar, 1890.

Angræcum—*continued.*

A. rostellare (beaked). *fl.* resembling those of *A. fuscatum* in shape, but having a distinct, long-linear, ascending, rostellar process, and spathulate, apiculate petals; peduncles numerous, many-flowered. *l.* cuneate-oblong, bilobed at apex, unusually soft. 1885.

A. Sanderianum (Sander's).* *fl.* snow-white, 1¼in. across; sepals and petals spreading; lip triangular; spur 3in. to 4in. long; spikes 1ft. long, gracefully drooping, bearing two rows of flowers. Early spring. *l.* tongue-shaped, about 6in. long, shining green, the margins tinged with red. Madagascar, 1888.

A. Smithii (Smith's). *fl.* brownish, very small; racemes slender, short, 1in. long, eight- to ten-flowered. Stems very short, leafless. German East Africa, 1895.

A. stylosum (having a prominent style). This species is closely related to *A. bilobum*, but the flowers are about twice as large; they are white, with a brownish spur. Madagascar, 1895. SYN. *A. Fournieræ* (R. H. 1896, p. 256).

A. tridactylites (three-fingered). *fl.* buff, distichous, ¼in. in diameter; sepals and petals ovate, acute; lip three-lobed, with two fleshy, marginal teeth at the base; racemes lateral, about 2in. long. *l.* linear, 3in. to 5in. long, unequally bidentate. Sierra Leone, 1888.

A. Veitchii (Veitch's). A hybrid between *A. sesquipedale* and *A. eburneum.*

ANGUILLARIA (named in honour of Luigi Anguillara, a professor of botany at Padua, who died in 1570). ORD. *Liliaceæ*. A small genus (two species) of Australian, bulbous plants, only differing from *Wurmbea* in having the perianth segments distinct from the base. *A. dioica* (SYN. *A. biglandulosa*) has been introduced, but is probably not now in cultivation.

A. indica (Indian). A synonym of *Iphigenia indica.*

ANGUILLILIDÆ. *See* **Eelworms** and **Nematoid Worms.**

ANGUINA. *See* **Trichosanthes anguina.**

ANGULOA. The Peruvian and Colombian Andes are the home of these plants. They are best accommodated in the intermediate house during the growing season, when they require a liberal amount of moisture at the roots. After the growth has matured, less moisture will be required—sufficient only, in fact, should be given to keep the "bulbs" in a plump condition. A cool, brighter, and a more airy position should also be afforded. To ensure satisfactory flowering, a thorough ripening is a necessity. The plants are deciduous when properly ripened. To the species and varieties described on p. 79, Vol. I., the following should be added:

FIG. 47. FLOWER OF ANGULOA CLOWESII.

A. Clowesii macrantha (large-flowered). *fl.* bright yellow, spotted red, larger than in the type. July. Colombia. A fine but scarce variety. A flower of the typical species is shown in Fig. 47.

A. dubia (doubtful). *fl.* yellow, the sepals and petals covered on the inside with small, purple spots; lip white, blotched purple inside at base. Colombia. Supposed to be a hybrid between *A. uniflora* and *A. Clowesii.*

A. Hohenlohii (Hohenlohe's). A synonym of *A. Ruckeri sanguinea.*

A. intermedia (intermediate). A synonym of *A. media.*

A. Madouxiana (Madoux'). A garden hybrid, supposed to be between *A. Ruckeri* and *A. uniflora.* 1894. (L. 434.)

Anguloa—*continued.*

A. media (intermediate). *fl.*, sepals and petals orange-yellow outside, brownish-purple internally, the lateral sepals being marked with a central, orange line; side lobes of the lip reddish-brown, the disk ochre, the anterior lobe short. A garden hybrid, probably between *A. Clowesii* and *A. Ruckeri.* SYN. *A. intermedia.*

A. purpurea (purple). A synonym of *A. Ruckeri sanguinea.*

A. Ruckeri alba (white), *fl.* pure white. 1883.

A. R. media (medium). *fl.*, sepals and petals yellow, strongly dotted with carmine over the whole of the inner surface; lip carmine. Colombia. 1887. A pretty variety. (L. 53.)

A. R. retusa (retuse). *fl.* yellowish outside, spotted dark purple within; lateral lobes of the lip rectangular, the middle lobe small, reflexed, hairy. 1883. A remarkable variety.

A. Turneri (Turner's). *fl.* pink, the sepals and petals densely spotted inside with bright rose-colour. May and June. Colombia. A beautiful plant.

A. uniflora eburnea (ivory-coloured). *fl.* ivory-white, 1892. (L. 348.)

A. u. Mantini (Mantin's). *fl.* slightly tinted with rose. 1895.

A. u. Treyerani (Treyeran's). *fl.* having the base of the lip marked with more numerous rosy bars than in the type. 1892. (L. 310.)

A. u. Turneri (Turner's). *fl.* bold; sepals pink, lighter on the back; petals bright rose-pink on the inside. 1896. A tall-growing form.

A. virginalis (virgin-white). *fl.* white, spotted dark brown. June and July. Pseudo-bulbs dark green. *h.* about 1ft. Colombia.

ANGURIA. This genus embraces about forty species, natives of tropical America. *A. Warscewiczii* is worth growing. It thrives in a rich soil of loam and peat, and may be propagated either by seeds or by cuttings.

A. Warscewiczii (Warscewicz's). *fl.* of a rich scarlet, spicate; calyx of the male flowers cylindrical; petals spreading, orbicular. Winter. *l.* petiolate, cordate, trifoliolate, dark green; leaflets stalked, the lateral ones somewhat hastate, the middle one obovate-oblong, all shortly acuminate, sinnate-angled. Panama, 1862. (B. M. 5304.)

ANHALONIUM (from *an*, without, and *helos*, a nail or spike; in allusion to the spineless tubercles). ORD. *Cacteæ*. A genus embracing about a dozen species of greenhouse, succulent perennials, natives of the Andean regions, from Northern Mexico to Peru. They are closely allied to *Mammillaria*—indeed, are included under that

FIG. 48. ANHALONIUM FISSURATUM.

Anhalonium—*continued.*

genus by Engelmann and by the authors of the "Genera Plantarum"—but for garden purposes may well be kept distinct. Seeds rather large, tubercled. Tubercles almost leaf-like, triangular, smooth, or warted and fissured above. For culture of the species introduced, *see* **Mammillaria.**

A. Engelmanni (Engelmann's). A synonym of *A. fissuratum.*

A. fissuratum (fissured). *fl.* rose-coloured, 1½in. wide, growing from the middle of the stem. September and October. Stem and rootstock shaped like a top, the rootstock being thick and woody; tubercles arranged in a thick layer, spreading from the centre, rosette-like. Mexico, 1885. This species resembles some of the Gasterias. SYN. *A. Engelmanni.* See Fig. 43.

A. furfuracea (scurfy). *fl.* lin. long; sepals brownish; petals white or pinkish. Tubercles shorter and more pointed, the surface irregularly mamillate, and the apex a cup-like depression containing the little cushion of hairs. Otherwise like *A. prismaticum.*

A. prismaticum (prismatic). *fl.* white, terminal, copiously woolly at the base. Stem wanting; tubercles radical, lin. broad, spirally imbricated, cartilaginous outside, deltoid, obtuse or retuse, somewhat prism-like in section; axils woolly. Mexico, 1888. SYNS. *Mammillaria aloides, M. prismatica* (B. M. 7279).

A. Williamsii (Williams'). A synonym of *Echinocactus Williamsii.*

ANIA. A synonym of **Tainia** (which *see*).

ANIGOSANTHUS. *See* **Anigozanthos.**

ANIGOSIA. A synonym of **Anigozanthos** (which *see*).

ANIGOZANTHOS. SYN. *Anigosia.* Eight species, confined to South-western Australia, are included in this genus. To the information given on pp. 79-80, Vol. I., the following should be added:

A. coccinea is synonymous with *A. flavida.*

A. fuliginosus (blackish-brown). A synonym of *Macropidia fumosa.*

A. Manglesii angustifolia (narrow-leaved). *l.* linear, strongly acuminate. (B. R. 2012.)

A. rufa (red). The correct name of *A. tyrianthina.*

ANILEMA. *See* **Aneilema.**

ANIMAL MANURES. Under this term is included all manure from cattle, poultry, fish, &c., whether obtained directly or indirectly. Farmyard manure is usually a mixture of animal and vegetable manure, as the voiding of the animals is mixed with straw, peat-moss, litter, or whatever is employed for bedding. If this latter be kept under cover and fairly dry, it is a perfect plant-food, and also acts chemically on the soil; but if exposed to wet much of the fertilising matter is lost, and the manure becomes of little value. From five to ten tons, according to the state of the land and the crop to be grown, is a moderate application per acre. Market-gardeners occasionally manure much heavier, but they crop their land in proportion.

Bone-meal, and bones in a coarser form, are valuable fertilisers; and the same may be said of fish manure in any form. Both are applied to various crops at the rate of 3cwt. to 5cwt. per acre. The best time for applying this manure is early in the season, when growth is commencing. Blood, again, is a powerful animal manure if properly prepared. Horn-shavings, hoof-parings, hair, and tanners' waste (consisting of hair and skin-scrapings) are all more or less rich, and are invigorating to nearly all crops. Shoddy has found much favour with hop-growers and others, and is made of cut woollen rags. Ground oyster-shells also constitute valuable manures, especially for Vines and stone-fruit bearing trees. In fact, almost everything belonging to animal life may be utilised for manure if it is available for nothing else.

ANISACANTHA (from *anisos*, unequal, and *akanthos*, a spine; application not clear). ORD. *Chenopodiaceæ.* A small genus (six species) of branched, greenhouse shrubs or under-shrubs, all Australian. Flowers solitary in the axils. Leaves linear, alternate, sessile. One species—*A. divaricata*—has been introduced, but is probably no longer cultivated.

ANISANTHERA (of Griffith). A synonym of **Adenosma** (which *see*).

ANISANTHERA (of Rafinesque). A synonym of **Caccinia** (which *see*).

ANISANTHUS. Included under *Antholyza. A. splendens* is synonymous with **Antholyza caffra** (which *see*).

ANISOCALYX. A synonym of **Herpestis** (which *see*).

ANISOCAMPIUM. Included under **Nephrodium** (which *see*).

ANISOGONIUM. Included under **Asplenium** (which see).

ANISOLOBUS. A synonym of **Odontadenia** (which *see*).

ANISOMERIS. A synonym of **Chomelia** (which *see*).

ANISOPTERYX ÆSCULARIA. *See* **Plum Insects.**

ANNESLEA (of W. Hooker). A synonym of **Calliandra** (which *see*).

ANNESLEA (of Roxburgh). A synonym of *Euryale, A. spinosa* being identical with **E. ferox** (which *see*).

ANNUAL MULLEIN. *See* **Verbascum Boerhaavii.**

ANNUAL RING. The ring or cylinder of wood produced by exogens during one year.

ANNUALS. The value of these plants in the outside garden is frequently discounted owing to the way in which they are treated by the cultivator. It is commonly supposed that because of their somewhat ephemeral nature these plants do not require as much attention to bring them to perfection as do the more permanent occupants of bed and border with which they are associated. Such is a mistake, and it is the slipshod culture which Annuals frequently receive that more than anything else tends to bring them into disrepute. Most important, for instance, is the soil. This should always be fairly rich and friable, the latter condition being very essential at seed-time. A pasty soil at the time of seed-sowing is responsible for many failures. Then the actual depth at which to sow ought to be considered alike in relation to the soil and the sorts under cultivation. The seeds of Annuals, like those of all other plants, vary considerably, and a depth that would be suitable to one kind would be absolutely fatal to the chances of another. The smallest seeds, of which Mignonette is a familiar example, should only have the lightest of covering sifted over them, whereas Sweet Peas and Nasturtiums should have three or four times their bulk of soil to cover them—¼in. or more.

In all cases, the gardener should bear in mind that, although a certain amount of thinning is absolutely necessary, much of the labour involved might be saved by judicious sowing. Light and air are very important factors in the production of sturdy plants, and with those Annuals sown in autumn to provide an early spring display it is very essential, otherwise growth will be sappy and the seedlings will damp off. For autumn work the seeds should be sown in drills, as then the hoe can be more vigorously applied to keep down weeds and to maintain an open condition of the soil, while, of course, thinning is facilitated. Now as to the thinning. The first should be made as soon as the seedlings are large enough to handle; the second should take place a fortnight or so later, leaving the plants some 2in. or so apart; and the third when the plants again show signs of overcrowding. In the last weeding out the gardener will have to be guided by the habit of the plant under consideration. With large-growing kinds from 9in. to 1ft. will not be too much space. Opinions differ as to the best means of employing Annuals, and after all it is largely a question

Annuals—*continued.*

of individual taste. They may be effectively introduced into beds, either alone or in conjunction with perennials, or in the mixed border; while not a few make pretty rockwork plants. Though not often practised by the amateur, Annuals may be readily grown in pots for greenhouse, room, and window decoration; and several make charming basket subjects. There are many ways which will occur to the ingenious gardener of showing off to advantage the various members of this much-abused group. Some Annuals will be best displayed by allowing them to trail over window-boxes; others will look well when growing up wire, twisted into various shapes, or when climbing over an informal arch, or the more formal trellis; and yet others look well simply as edging plants. In very poor soils the gardener is often puzzled to know what floral subject to try. There is nothing better than the Nasturtium, which will blossom luxuriantly in a spot which would be fatal to the chances of almost any other subject. On the score, too, of cheapness Annuals generally should appeal; while the ease with which they are increased adds another point of interest. To obtain, however, a maximum of blossom from Annuals they must not be allowed to seed. The flowers should be removed directly they are past their best. They must also be kept watered should a period of drought set in. At such times, too, it will be found of very great advantage to provide plants like Sweet Peas with a mulch. This tends to preserve the soil in a moist condition, and is better than the too frequent use of the watering-pot. Stakes must be provided for plants needing such support as early as possible; there is no necessity nowadays to use anything unsightly for this, as the light-looking bamboo sticks can be employed for most; while for graceful subjects, like Gypsophilas, the support may consist of small branches of birch, which are soon hidden by the luxuriant growth of the subject under cultivation. Sweet Peas may be usefully employed for window-boxes by allowing the plants to droop over instead of providing them with stakes. Slugs are the greatest enemies to the majority of Annuals, and they must be either trapped by means of lettuce-leaves or bran-heaps, or prevented by surrounding the plants with coarse sand and soot.

Annuals—*continued.*

For providing a display of varied flower and foliage the gardener should look to the following genera: *Abronia, Acroclinium, Adonis, Ageratum, Alonsoa, Amarantus, Alyssum, Ambrosia, Asperula, Aster* (Victoria, Comet, Chrysanthemum-flowered, Bouquet, and Quilled), *Bartonia, Bidens, Brachycome, Cacalia, Calendula* (Meteor and Orange King), *Campanula, Centaurea, Chrysanthemum, Clarkia, Collinsia, Convolvulus, Coreopsis, Cosmos, Delphinium, Dianthus, Erysimum, Eucharidium, Gilia, Godetia,* Grasses in variety *(Bromus, Briza, Coix, Eragrostis, Lagurus, &c.), Gypsophila, Helianthus, Helichrysum, Impatiens, Ionopsidium* (for foot of rockwork this is excellent), *Jacobæa, Lavatera, Leptosiphon, Limnanthes, Linaria, Linum, Lupinus, Martynia, Mathiola, Nasturtium, Nemophila, Nicotiana, Nycterinia, Papaver, Perilla, Phlox, Portulaca, Reseda, Rhodanthe, Salpiglossis, Salvia, Sanvitalia, Saponaria, Scabiosa, Schizanthus, Schizopetalon, Silene, Statice, Tagetes, Torenia, Whitlavia, Xeranthemum,* and *Zinnia.*

ANODA (from *a*, privative, and *nodus*, a knot; the pedicels are without the articulation observable in the allied genus *Sida*). ORD. *Malvaceæ*. A genus embracing about eight species of greenhouse or half hardy, hispid or glabrescent herbs, with the habit of *Malva*. A few of them have been introduced, but none are of any horticultural value.

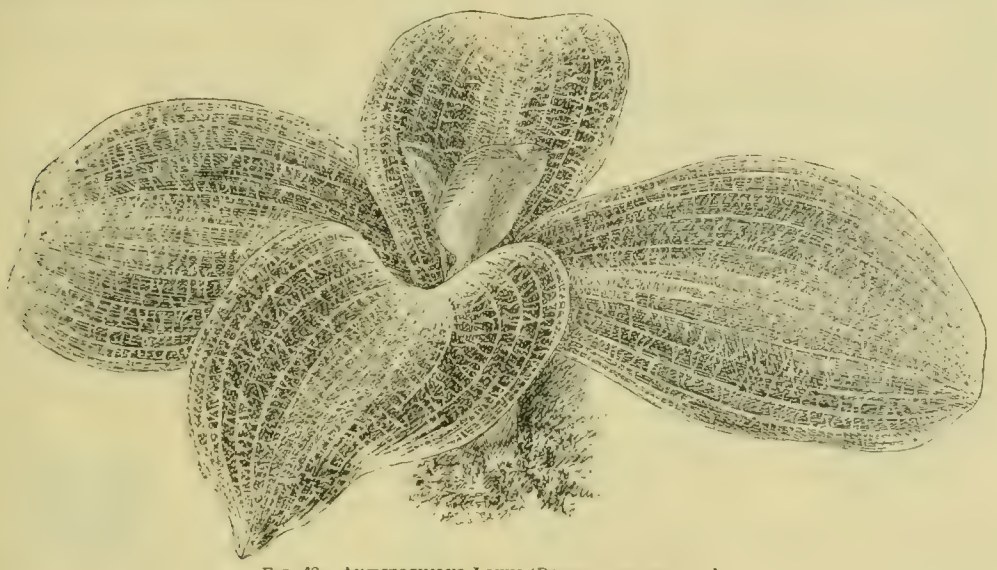


FIG. 49. ANŒCTOCHILUS LOWII (DOSSINIA MARMORATA).

ANODONTEA. Included under **Alyssum** (which *see*).

ANŒCTOCHILUS. SYNS. *Anecochilus, Chrysobaphus.* According to the authors of the "Genera Plantarum," there are only about eight really distinct species, natives of the East Indies and the Malayan Archipelago.

The numerous species and varieties of this genus are grown principally for their gaudy foliage. They are usually difficult subjects to manage; but when a suitable position is found to meet their requirements, there are few plants that are grown more easily or need less attention. Spacious bell-glasses are suitable for their culture. These should be kept close, placed on a bed of ashes or coke breeze, which should be always moist. Under these conditions, there will be a constant condensation on

Ancectochilus—*continued.*

the inside of the glass, so that very little water will be required at the roots of the plants at any time.

To the species and varieties described on pp. 81-2, Vol. I., the following should be added. Several species formerly included here are now classed under **Physurus.**

A. Boylei (Boyle's). *l.* ovate, acuminate, 2in. long and broad, olive-green, netted and pencilled over the entire surface with gold. India.

A. concinnus (neat). *l.* ovate, acuminate, rounded at base, dark olive-green, striped and netted with shining coppery-red. Assam.

A. Dominii (Dominy's).* *l.* dark olive-green, the centre marked by a pale coppery-yellow streak, and the main ribs by pale lines. A vigorous garden hybrid between *Goodyera discolor* and *Anœctochilus xanthophyllus.*

A. Eldorado (Eldorado). *l.* dark green, with small tracery of a lighter colour, deciduous. Central America. This species is difficult to cultivate; it must never be allowed to get dry at the roots, even when the leaves have died down.

A. Friderici-Augusti (Frederick Augustus'). This is identical with *A. xanthophyllus.*

A. Heriotii (Heriot's). *l.* 3½in. long, 2½in. broad, dark mahogany-colour, with golden reticulations, a shadow of network showing through the surface. India.

A. hieroglyphicus (hieroglyph-marked). *l.* ovate-elliptic, small, dark green, marked with silvery-grey blotches of hieroglyphic character. Assam.

A. javanicus (Java). A synonym of *Argyrorchis javanica.*

A. Lansbergiæ (Mme. van Lansberge's). *l.* larger than those of *Dossinia marmorata;* groundwork of upper surface dull velvety-maroon, median nerve and smaller veins emerald, lines near margin dull gold; under-surface light salmon-colour. A vigorous species. (I. H. ser. v. 1.)

A. latimaculatus (broadly-spotted). *l.* dark green, with silvery markings. Borneo.

A. lineatus (lined). A synonym of *Zeuxina regia.*

A. Lobbianum (Lobb's). A synonym of *A. Roxburghii.*

A. Lobbii (Lobb's). A synonym of *A. argyroneura.*

A. Lowii. This large and beautiful species (the correct name of which is *Dossinia marmorata*) is illustrated in Fig. 49. The under-surface of the leaves is pale yellow, tinged with rose.

A. Nevillianus (Neville's). *l.* oblong-ovate, 1½in. long, of a rich, dark, velvety, coppery or bronzy hue, marked with two rows of pale, oblong blotches. *h.* 3in. Borneo.

A. Petola (Petola). A synonym of *Macodes Petola.*

A. querceticola (Oakwood-dwelling). A synonym of *Physurus querceticolus.*

A. regalis (royal). The correct name of *A. setaceus.*

A. Reinwardtii (Reinwardt's). *l.* deep velvety-bronze, intersected with bright golden lines. Java, 1861. A handsome species, somewhat resembling *A. regalis.* (B. H. 1861, 18.)

A. Sanderianus (Sander's). A synonym of *Macodes Sanderiana.*

A. Veitchii (Veitch's). This is identical with *Macodes Petola.*

ANOGRAMME. Included under **Gymnogramme** (which *see*).

ANOIGANTHUS (from *anoigo*, to expand, and *anthos*, a flower; in allusion to the shape of the perianth). ORD. *Amaryllideæ.* A monotypic genus. The species is a greenhouse, bulbous plant, requiring similar culture to **Hæmanthus** (which *see*). It will, however, succeed outside if protected in the winter.

A. breviflorus (short-flowered). *fl.* two to ten in an umbel; perianth bright yellow, about 1in. long, regular, erect, the tube about a quarter or a third as long as the oblong-lanceolate segments; peduncle 6in. to 12in. long. October to February. *l.* three or four, contemporary with the flowers, lorate, 1ft. or more in length. South Africa, 1888. (B. M. 7072.) SYN. *Cyrtanthus lutescens,* of gardens. The variety *minor* is a dwarf, mountain form, with narrow perianth-segments.

ANOMA. A synonym of **Moringa** (which *see*).

ANOMALA FRISCHII. *See* **Vine Animal Pests.**

ANOMALA VITIS. *See* **Vine Animal Pests.**

ANOMALOPTERIS. A synonym of **Acridocarpus** (which *see*).

ANOMATHECA. This genus of three species is included, by Bentham and Hooker, and by J. G. Baker, under **Lapeyrousia** (which *see*), the specific names

Anomatheca—*continued.*

remaining unchanged; but for garden purposes it has been kept distinct in this work. To the species described on p. 82, Vol. I., the following should be added:

A. grandiflora (large-flowered). *fl.*, perianth tube 1in. long; limb bright scarlet, 2in. in diameter, the segments oblong or oblong-lanceolate; spikes lax, five- or six-flowered; peduncle (including the inflorescence) 1ft. long. October. *l.*, produced ones six to eight in a distichous, nearly basal rosette, linear, 1ft. or more in length. Eastern tropical Africa, 1883. (B. M. 6924, under its correct name, *Lapeyrousia grandiflora.*)

ANOMOCHLOA (from *anomos*, lawless, and *Chloa*, Grass; the genus differs from most other Grasses in having four stamens instead of three). ORD. *Gramineæ.* A monotypic genus. The species, *A. marantoidea* (B. M. 5331), is a stove, perennial Grass, having distinctly stalked leaves 4in. to 5in. long and 1in. to 2in. broad. It is more of a curiosity than an object of beauty from a horticultural standpoint.

ANOMORHEGMIA. A synonym of **Stauranthera** (which *see*).

ANONA. This genus embraces nearly fifty species, natives of tropical America, Africa, and Asia.

A. chrysopetala (golden-petaled). A synonym of *Guatteria Ouregou.*

A. triloba (three-lobed). A synonym of *Asimina triloba.*

ANONIS. A synonym of **Ononis** (which *see*).

ANONYMOS BRACTEATA. A synonym of **Zornia tetraphylla** (which *see*).

ANREDERA (a commemorative name; but of Anreder nothing is known). SYNS. *Beriesa, Clairisia, Siebera.* ORD. *Chenopodiaceæ.* A monotypic genus. The species is a slender, highly glabrous, greenhouse, tuberous-rooted, perennial herb, allied to *Boussingaultia.*

A. scandens (climbing). A synonym of *A. spicata.*

A. spicata (spiked). *fl.* white, small, in long, flexuous, cylindrical, axillary spikes. *l.* alternate, narrowed into the petioles, ovate, acute, entire, somewhat fleshy. Stems angular. Subtropical America, from Peru to Texas, 1889. SYN. *A. scandens.*

ANSELLIA. This genus consists of only three or four species, broadly dispersed through tropical Africa, one extending as far as Natal. *A. gigantea* and *A. nilotica,* described in Vol. I. as varieties of *A. africana,* are good species. To the species and varieties described on p. 83, Vol. I., the following should be added:

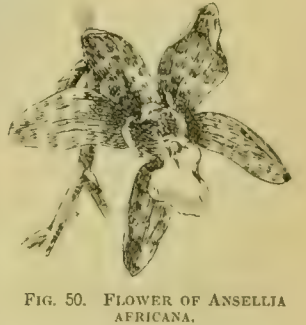


FIG. 50. FLOWER OF ANSELLIA AFRICANA.

A. confusa (confused). This differs from *A. africana* (a flower of which is illustrated at Fig. 50) in having the petals scarcely broader than the sepals. Western tropical Africa.

A. congoensis (Congo). *fl.* produced in racemes, with erect, not spreading, pedicels; sepals and petals light greenish-yellow, with dark purplish-brown spots; side lobes of the lip whitish, veined purple, the narrow front lobe yellow, the two keels on the disk almost vanishing before reaching the middle of the front lobe. Congo, 1886. A handsome plant, similar to *A. africana,* but more floriferous.

A. humilis (dwarf). *fl.* lemon-yellow, blotched and barred with chocolate, about 2in. in diameter, disposed in large panicles. Zambesi, 1891. A compact, free-growing species. The variety *pallida* differs from the type in having the ground-colour of the flowers milk-white.

ANT. *See* **Ants.**

ANTENNARIA. This genus embraces about ten species, inhabiting the mountainous regions of Europe, Asia, and North America, one being found in Australia. To the information given on p. 83, Vol. I., the following should be added. *See also* **Anaphalis.**

Antennaria—*continued.*

A. alpina (alpine). *fl.-heads* pink, sub-sessile, in a cymose cluster, or sometimes solitary; involucre livid-brownish, ¼in. long. June. *l.* radical ones spathulate, ½in. long; cauline ones linear. Flowering stems 1in. to 4in. high, bearing two to five heads, or, in the variety *monocephala*, one head. Europe, North America, &c., 1775. Plant tufted, suitable for the rockery.

A. candida (white). A garden synonym of *A. tomentosa.*

A. margaritacea and **A. triplinervis** are now classed under *Anaphalis.*

ANTHEMIS. Including *Chamomilla* (in part). Over eighty species have been described (but this number may be reduced), natives of Europe, Asia, and North Africa. Though the members of this genus known to the old-time gardener had little to recommend them, the newer kinds are excellent border plants, and furnish a quantity of useful material for cutting. They require neither special soil nor special culture, and are readily increased. The best kinds to grow are the garden forms of *A. tinctoria*, *Kelwayi*, *Kelwayi alba*, Canary Bird, and Mrs. H. T. Brooks. These are various shades of yellow and white. All are worthy of being included amongst showy, hardy, border flowers, as they last a long time in good condition, and their period of flowering extends over several months.

To the species described on p. 83, Vol. I., the following should be added. *See also* **Achillea** and **Anacyclus.**

A. Aizoon. The correct name is *Achillea ageratifolia.*

A. chia (Chio). *fl.-heads* white, with a yellow disk, solitary, on long peduncles; involucral scales oblong, with fuscous margins, April to June. *l.* petiolate, glabrous, pinnatipartite; lobes incised or pinnatifid; lobules mucronate; petioles somewhat sheathing at base. *h.* 8in. to 12in. Chio, &c. (S. F. G. 884.)

A. frutescens (shrubby). *See* **Chrysanthemum frutescens** and **Pyrethrum frutescens.**

A. macedonica (Macedonian). *fl.-heads* white, Daisy-like, with a dark yellow centre, produced in succession throughout the summer. *l.* much divided, of a very pleasing glaucous hue. *h.* 6in. to 8in. Macedonia, 1894. A neat, compact bush, about 1½ft. across. (Gn. xlvi., 1894, p. 519.)

A. montana (mountain).* *fl.-heads* white or purplish; outer involucral scales fuscous-margined August and September. *l.* petiolate, sometimes simply pinnatipartite, sometimes nearly bipartite, the lobes acute or obtuse. Stem shrubby at base, ascending, naked for a long way at the top, one-headed, and, as well as the leaves, pubescent or almost silky. Europe, &c., 1759. SYN. *A. saxatilis.*

A. purpurascens (purplish). A synonym of *Anacyclus radiatus purpurascens.*

A. saxatilis (rock-loving). A synonym of *A. montana.*

ANTHEPHORA (from *anthos*, a flower, and *phoreo*, to bear). ORD. *Gramineæ.* A small genus (about five species) of half-hardy, branched or tufted, sometimes tall Grasses, natives of tropical America and tropical and South Africa. Spikelets one-flowered; glumes three or four; spike terminal, elongated; rachis flexuous. Two of the species have been introduced, but it is doubtful if they are still in cultivation.

ANTHERICUM. Including *Liliago.* About fifty species are comprised in this genus; they are natives of Europe, tropical and extra-tropical Africa, and America. To those described on pp. 83-4, Vol. I., the following should be added. For other species formerly included hereunder, *see* **Bottionea, Bulbine, Chlorogalum, Chlorophytum, Paradisia,** and **Trichopetalum.**

A. echeandioides (Echeandia-like). *fl.* arranged in pairs in a simple, loose raceme less than 1ft. long; perianth ¾in. long, the segments orange-yellow, with a keel of three greenish ribs; peduncle simple, terete, above 1ft. long. November. *l.*, produced ones five or six, confined to the base of the stem, lanceolate, about 1ft. long, bright green, membranous, channelled. Probably Mexico, 1883. Greenhouse. (B. M. 6809.)

A. Liliastrum. The correct name is *Paradisia Liliastrum.*

ANTHIDIUM MANICATUM. *See* **Wood-boring Bees.**

ANTHOCLEISTA (from *anthos*, a flower, and *cleistos*, shut up; alluding to the shape of the blossoms). ORD. *Loganiaceæ.* A small genus (three or four species) of stove trees or shrubs, sometimes climbing, natives of tropical Africa. Flowers white or dirty yellowish, rather

Anthocleista—*continued.*

large, in terminal, trichotomous cymes, with thick branches; calyx four-parted, the segments thick, orbicular; corolla tubular-campanulate, the lobes ten to sixteen, twisted; stamens ten to sixteen, affixed below the throat; pedicels short; bracts scale-like. Leaves large, sometimes several feet long, opposite, obovate or oblong, entire; petioles dilated or sheathing at base. The following species have been introduced; they thrive in a compost of peat and loam, and may be propagated by cuttings.

A. insignis (remarkable). *fl.* yellow, about 1½in. long; cymes many-flowered. *l.* oblong, shining green, 4½ft. long, 1½ft. broad. *h.* 70ft. Swaziland, 1895.

A. macrophylla (large-leaved). *fl.* white; corolla twelve-lobed; stamens twelve. *l.* broadly obovate, obtuse, membranous, "as large as those of a common Cabbage." *h.* 20ft. Sierra Leone, 1820.

ANTHOCORIS NEMORUM. *See* **Shy Bug.**

ANTHOLYZA. SYN. *Cunonia* (of Miller). This genus embraces about a dozen species of stove and greenhouse plants, natives of tropical and South Africa. Those described on p. 84, Vol. I., are revised by Mr. J. G. Baker as follows. Several species formerly included here are now classed under **Watsonia.**

A. æthiopica (African).* *fl.* reddish-yellow, in moderately dense spikes 6in. to 9in. long; perianth-tube curved, 1½in. to 1¾in. long, the upper segment red, 1½in. long, the others much shorter, spreading. June. *l.*, basal ones several, 1ft. to 1½ft. long, 1in. or more broad. Stem branched, 3ft. to 4ft. high. Cape Colony, 1759. (B. M. 561.) SYNS. *A. floribunda*, *A. præalta*, *A. ringens* (A. B. R. 32).

A. æ. bicolor (two-coloured).* *fl.*, perianth-tube red at the top, pale yellow downwards. *l.* narrower and habit dwarfer than in the type. SYNS. *A. æ. minor* (B. R. 1159), *A. bicolor* (B. H. ii., p. 145).

A. æ. minor (lesser). A synonym of *A. æ. bicolor.*

A. æ. vittigera (striped).* *fl.*, perianth-tube bright yellow, with stripes of red. (B. M. 1172, under name of *A. vittigera.*)

A. bicolor (two-coloured). A variety of *A. æthiopica.*

A. brevifolia (short-leaved). A synonym of *A. caffra.*

A. quadrangularis (quadrangular).* *fl.* two to four in a loose spike; perianth variegated with bright red and yellow, the tube 2in. long, the upper segment red, ¾in. long, the others much smaller, greenish. April. Stem slender, 2ft. to 3ft. long, bearing two or three narrow-linear leaves. Corm large. Cape Colony, 1760. SYNS. *Gladiolus abbreviatus* (A. B. R. 116), *G. quadrangularis* (B. M. 567).

A. ringens (gaping). A synonym of *A. æthiopica.*

A. rupestris (rock-loving). A synonym of *A. caffra.*

A. Schweinfurthii (Schweinfurth's). *fl.*, perianth bright red shading to bright yellow at the base, 1½in. to 1¾in. long, curved, the tube suddenly dilated; spike simple, lax, many-flowered. *l.* five or six, linear, Grass-like, superposed, the lower ones 6in. long. Stem terete, about 1ft. long below the spike. Abyssinia, 1894.

A. vittigera (striped). A variety of *A. æthiopica.*

ANTHOMYIA. ORD. *Diptera.* Several very destructive insects fall under this genus. The most noteworthy are the Onion Fly (*A. ceparum*), Beet Fly (*A. betæ*), Radish Fly (*A. radicum*), Cabbage Fly (*A. brassicæ*), and Lettuce Fly (*A. lactucæ*). All are of somewhat dingy colouring, and resemble house-flies. They are some ⅛in. in length, or perhaps a trifle smaller; while the grub is of about the same length, whitish, and footless. There are several generations of the pests. Those above enumerated are described under the Common names given, except in the case of the Radish Fly, which is dealt with under **Radish.**

ANTHONOMUS POMORUM. *See* **Apple-blossom Weevil.**

ANTHOSPERMUM. This genus includes about twenty-five species of small shrubs, mostly South African, a few being found in tropical Africa and Madagascar. Flowers minute, dicœcious, rarely polygamous or hermaphrodite, axillary, sessile, bracteolate. Leaves small, opposite or whorled, narrow, Heath-like.

ANTHRACNOSE. This is a popular name for certain virulent fungoid diseases which attack various plants: French Bean, Vine, Currant, Spinach, Raspberry, Privet, Blackberry, and many others. The most destructive, however, is Vine Anthracnose, *Phoma ampelinum* (*Sphaceloma ampelina*). In this case, leaves, stems, and fruit are all involved, and the disease, once it has obtained a hold, is difficult to combat. On the Continent Grape Anthracnose is very prevalent; it is also known in this country and in America. For full description, *see* **Grape Anthracnose, Bean Anthracnose,** &c.

ANTHRISCUS (a name given by Pliny to a plant resembling Scandix). ORD. *Umbelliferæ*. A genus of about ten species of hardy, or half-hardy, annual, biennial, or rarely perennial herbs, with the habit of *Chærophyllum*, inhabiting North temperate and sub-tropical regions. Flowers white, in compound umbels; involucral bracts one, two, or wanting. Leaves pinnately or sub-ternately decompound. Only one species calls for mention. For culture, *see* **Chervil, Common or Garden.**

A. cerefolium (waxy-leaved). Common Chervil. *fl.* slightly radiant; umbels axillary or opposite the leaves, sessile. June. *l.* twice pinnately cut, with channelled footstalks. Stem a little hairy at the joints. *h.* 1½ft. Europe (frequently met with as an escape from cultivation in Britain). Annual. SYN. *Chærophyllum sativum* (Sy. En. B. 623).

ANTHURIUM. This genus embraces about 160 species, all tropical American, and there are now a large number of beautiful hybrids in cultivation. To those described on pp. 85-7, Vol. I., the following should be added:

A. acutum (acute-leaved). *fl.*, spathe reflexed, 2½in. long; spadix dark green, 2½in. to 3in. long. *l.* spreading, 6in. to 10in. long, 3½in. to 4in. broad across the tips of the hind lobes, triangular-hastate, gradually tapering to an exceedingly acuminate point; petioles 10in. to 12in. long, slender. Brazil, 1887.

A. album maximum (white, largest). This is a large, white-spathed form of *A. Scherzerianum*.

A. a. m. flavescens (yellowish). A synonym of *A. Scherzerianum lacteum*.

A. Allendorfii (Allendorf's). *fl.*, spathe deep crimson; spadix yellowish. 1889. A garden hybrid between *A. Andreanum* and *A. Lindenianum*. (R. G. 1293 e.)

A. Andreanum album (white). *fl.*, spathe pure white, as large as in the type, but less corrugated; spadix rigid. 1895.

A. A. amœnum (pleasing). *fl.*, spathe rose-carmine; spadix white, tipped with yellow. 1893.

A. A. atropurpureum (dark purple). *fl.*, spathe of a deep crimson, large. 1889. A hybrid between *A. Andreanum* and *A. Chantrieri*.

A. A. atrosanguineum (dark bloody). *fl.*, spathe dark crimson. 1893.

A. A. flore-albo (white-flowered). A white-spathed form.

A. A. grandiflorum (large-flowered). *fl.*, spathe 8½in. long; spadix 4in. long. 1886. (L. H. 1886, 599.)

A. A. Louisæ (Louisa's). *fl.*, spathe large, of a beautiful salmon-rose. 1889. A handsome variety.

A. A. roseum (rosy). A synonym of *A. cruentum*.

A. A. sanguineum (bloody). *fl.*, spathe of a rich, deep crimson, with darker shadings, medium-sized. 1892.

A. Archiduc Joseph. *fl.*, spathe of a beautiful, clear scarlet, broadly cordate, 4in. to 5in. long, 3½in. to 4in. broad; spadix flesh-colour, with whitish, exserted styles. *l.* cordate-ovate, rather abruptly acuminate at apex, deeply cordate at base; petioles terete, elongated. 1885. A hybrid between *A. Andreanum* and *A. Lindeni*.

A. brevilobum (short-lobed). *fl.*, spathe purplish, 2in. long, ½in. broad, narrow-lanceolate, acuminate; spadix dark purplish-brown, 3in. to 4in. long, ¼in. thick; peduncle brownish-purple, 1ft. to 1½ft. long, terete. *l.* 8in. to 10in. long, 4in. to 4½in. broad, parchment-like in texture, cordate-ovate, acuminate, bright, shining green above, paler beneath, the lobes short; petioles 1ft. to 1½ft. long, terete, channelled. Stem elongating, rooting, Native country unknown. 1887.

A. burfordiense (Burford). *fl.*, spathe brilliant scarlet, very large. 1889. A hybrid, very similar to *A. carneum*, *A. mortfontanense*, &c.

A. candidum (white). A synonym of *Spathiphyllum candidum*.

A. carneum (flesh-coloured). *fl.*, spathe light rose-colour, cordate-ovate, with longitudinal depressions; spadix rose-colour.

Anthurium—*continued.*

with a whitish glaze; peduncle terete, rather longer than the petioles. *l.* green, shortly cordate, cuspidate; petioles short, terete. 1884. A garden hybrid between *A. Lindenianum* and *A. Andreanum*.

A. Chamberlaini (Chamberlain's). *fl.*, spathe of a pale, dull puce-colour outside, shining crimson within, boat-shaped, erect, 3in. to 5in. long, 3in. broad; spadix dull reddish-purple, 6in. long, ¾in. thick, on a stalk about ¾in. long; peduncle 1ft. or more in length. *l.* cordate, 3ft. long, 2ft. broad; petioles 3½ft. to 4ft. long. Venezuela (?). 1886. A fine, bold-looking plant. (B. M. 7297; G. C. 1888, iii., pp. 464-5, f. 66-67; L. H. xxxv., t. 62.)

A. Chantinianum (Chantin's). *fl.*, spathe reddish-pink with paler stripes, ovate-triangular, 7in. long; spadix pale pink. *l.* oval-oblong, cordate at base, 1½ft. long. A garden hybrid between *A. Houlletianum* and *A. Andreanum*. 1889.

A. Chantrieri (Chantrier's).* *fl.*, spathe ivory-white, erect, oblong, acuminate; spadix dark violet; peduncle green, terete, shorter than the petioles. *l.* triangular or rhomboid, acuminate, with widely spreading basal lobes, dark shining green; petioles olive-green, terete. 1884. A vigorous hybrid between *A. subsignatum* and *A. ornatum*.

A. chelseiense (Chelsea). *fl.*, spathe rich crimson, smooth and glossy, broadly cordate, cuspidate at apex, 3½in. to 5in. long, 2½in. to 3½in. broad; spadix at first yellowish at the apex, the basal part white. *l.* resembling those of *A. Veitchii*, but more ovate in form, and having fewer and less arched veins. 1885. A garden hybrid between *A. Veitchii* and *A. Andreanum*.

A. crassifolium (thick-leaved). *fl.*, spathe light green, reflexed; spadix dull green, sessile, 2in. long; peduncle green, terete, as long as the petioles. *l.* ovate-lanceolate, very thick and stiff, with a very short, rigid mucro at the obtuse apex; petioles long. 1883.

A. cruentum (bloody). A garden hybrid, of the same origin as *A. mortfontanense*, and resembling that plant, but having blood-red spathes. 1886. SYN. *Andreanum roseum*.

A. crystallinum variegatum (variegated). A handsome variety, with very distinct variegation; in some instances the leaves are mostly ivory-white, while in others they are bronzy-green, marbled with yellow and white. 1893.

A. cymbiforme (boat-shaped). *fl.*, spathe white, large, very ornamental; spadix salmon-pink. *l.* cordate. Colombia (?), 1889.

A. Dechardi (Dechard's). A synonym of *Spathiphyllum cannæfolium*.

A. dentatum (toothed). *l.* large, cordate, deeply lobed, bright green, with paler nerves, the old ones sometimes shaded with dark glaucous reflections, the lobes ovate, acute; young leaves cordate, entire. 1884. A garden hybrid between *A. fissum* and *A. leuconeurum*. (R. H. 1884, p. 293.)

A. Desmetianum (De Smet's). *fl.* spathe carmine-scarlet, large, cordate-ovate acute, goffered; spadix ivory-white, tipped with golden-yellow, short. *l.* hastate. A hybrid between *A. Andreanum* and *A. Leopoldi*. (L. H. xxxv., t. 52.)

A. Devansayanum (Devansay's).* *fl.*, spathe and spadix erect, the latter stipitate. *l.* cordate, wavy, acuminate, erect; petioles terete. 1883. Garden hybrid. (R. H. 1882, p. 289.)

A. Dr. Lawrence. *fl.*, spathe salmon-pink, 8in. by 7½in. *l.* deep green. 1898.

A. eburneum (ivory-white). A garden hybrid between *A. Andreanum* and *A. ornatum*. 1891.

A. Eduardi (Eduard's). *l.* somewhat triangular-ovate, having a very open sinus and rounded basal lobes, dark green, with a violaceous lustre; petioles short, firm, terete. 1884. A garden hybrid between *A. crystallinum* and *A. subsignatum*.

A. elegans (elegant). *fl.*, spathe green, broadly lanceolate, 3½in. to 3¾in. long; spadix dark purple or green. *l.* cordate-ovate in outline, pedately radiate, with nine to thirteen very unequal segments, the intermediate one nearly twice the size of the lateral ones; petioles more than twice the length of the blade. Colombia, 1883. (R. G. 1112.)

A. flavidum (yellowish). *fl.*, spathe pale yellowish or yellowish-green, spreading, oblong, abruptly cuspidate; spadix pale violet-pink, 1½in. to 3in. long, sessile; peduncle 5in. to 6in. long. *l.* cordate-ovate acuminate, 10in. to 14in. long. Colombia, 1885.

A. floribundum (abundant-flowered). A synonym of *Spathiphyllum floribundum*.

A. Frœbelii (Frœbel's). *fl.*, spathe bright, deep carmine, large, with depressions as in *A. Andreanum*. *l.* large, cordate. 1886. A fine, free-flowering hybrid between *A. Andreanum* and *A. ornatum*.

A. Galeottianum (Galeotti's). *fl.*, spathe linear-lanceolate, acuminate, slightly exceeding the elongated-cylindrical spadix, *l.* coriaceous, green above, glaucous beneath, long-linear-lanceolate, rounded and often cordate at base, long-acuminate at apex. Caudex densely leafy. Brazil, 1858.

A. gandavense (Ghent). A garden hybrid between *A. Andreanum* and *A. Chantrieri*. 1893.

A. Glaziovii (Glaziou's). *fl.*, spathe dirty green outside, dull vinous-purple within, horizontally spreading, 7in. long, 1in.

Anthurium—*continued.*

broad; spadix vinous-purple, spotted with the black stigmas, erect, shortly stipitate, 8in. long. June. *l.* four or five, sub-erect, dark, shining green, narrowly oblong-obovate or oblong-oblanceolate, obtuse or sub-acute, coriaceous, flat, strongly nerved. Rio de Janeiro (?), 1880. (B. M. 6833.)

A. Goldringi (Goldring's). A garden hybrid between *A. Andreanum* and *A. Scherzerianum*. 1893.

A. Greyanum (Grey's). A garden hybrid between *A. ornatum* and *A. Andreanum*. 1892.

A. Grusoni (Gruson's). *fl.*, spathe deep crimson, very large; spadix yellowish-pink. 1889. A garden hybrid between *A. Andreanum* and *A. Lindenianum*. (R. G. 1293 a.)

A. Gustavi (Gustav's).* *fl.*, spathe green, erect, narrow-lanceolate, shorter than the spadix; spadix cylindrical, sessile, obtuse, about 5in. long; peduncle much shorter than the petioles. *l.* roundish-cordate or cordate-ovate, sub-obtuse, 2½ft. long, 1½ft. to 2ft. broad, deeply nerved; petioles sub-terete, 2ft. long. Caudex very short, erect. Buonaventura, 1883. (B. M. 7437; R. G. 1076.)

A. Hardyanum (Hardy's). A garden hybrid between *A. Andreanum* and *A. Eduardi*. 1889.

A. Hollandi (Holland's). A garden hybrid between *A. grande* and *A. ferrierense*, 1893.

A. Hookeri (Hooker's). A synonym of *Pothos acaulis*.

A. Houlletianum (Houllet's). *fl.*, spathe pale rose-coloured, cordate-ovate, acute; spadix olive-green, passing into yellow; peduncle much longer than the leaves, terete. *l.* cordate-oblong, dark, shining green, with satiny or metallic reflections; petioles short, cylindric. 1884. A garden hybrid between *A. magnificum* and *A. Andreanum*.

A. hybridum (hybrid). *l.* broad, bluntly hastate, green, borne on brown, terete petioles. 1874. A distinct plant.

A. inconspicuum (inconspicuous). *fl.*, spathe bright green, ¾in. to 1in. long, ¼in. broad, reflexed; spadix dark violet-brown, ¼in. to 1in. long; scape 6in. to 9in. long. *l.* 9in. to 12in. long, 1½in. to 3in. broad, narrowly elongate-elliptic, narrowed to both ends; petioles 6in. to 9in. long. Stem (probably) elongating. Brazil, 1835.

A. insigne (remarkable). The correct name of the plant described on p. 97, Vol. III., as *Philodendron Holtonianum*.

A. intermedium (intermediate). *l.* deflexed, cordate, oblong-ovate, velvety green, with a slight orange tinge, the midrib and veins whitish. 1884. A garden hybrid between *A. hybridum* and *A. crystallinum*.

A. isarense. *fl.*, spathe pure white, horizontal, oblong-lanceolate; spadix pinkish-white, thick, conical. *l.* cordate-oblong, at first having metallic reflections; petioles long. A hybrid between *A. Veitchii* and *A. ornatum*, raised by MM. Chantrier.

A. Kellermanni (Kellermann's). *fl.*, spathe small; spadix longer than the spathe. *l.* light green, large, sagittate, with a broad, open, rounded sinus, and a few large teeth on the margins; auricles broad and very obtuse. Origin unknown. 1893.

A. Kolbii (Kolb's). *fl.*, spathe very deep crimson, 3in. long; spadix pale yellow. 1889. A garden hybrid between *A. Andreanum* and *A. Lindenianum*. (R. G. 1293 b.)

A. Lawrenceæ (Lady Lawrence's). *fl.*, spathe almost pure white, glistening, very large, rounded; spadix also white. 1892. A garden hybrid.

A. Lawrenceanum (Sir Trevor Lawrence's).* *fl.*, spathe dark carmine-red, bright rose at back, cordate, 6in. long, horizontal, acutely pointed; spadix carmine-red, erect, robust, 4in. long. *l.* cordate-oblong, acute, dark green, paler at back. 1888. A hybrid between *A. Houlletianum* and *A. Andreanum* (R. H. 1888, p. 12.)

A. leodiense (Liége). *See* **A. mortfontanense.**

A. Lindenianum flore-carmina (carmine-flowered). *fl.*, spathe bright bronzy-carmine, large, boat-shaped; spadix more of a rosy tint. *l.* dark green, large. 1893.

A. longispathum (long-spathed). *fl.*, spathe 1½ft. long; spadix very stout, cylindric, 2ft. long; peduncle grooved, stout, 3ft. long. *l.* 2ft. long, 1½ft. broad, thick, coriaceous, deeply cordate at base, pale green, the veins very prominent beneath; petioles long. Guadeloupe, 1888. Plant stemless.

A. lucidum (clear). *fl.* violet-purple with yellow anthers; spathe lanceolate, cuspidate; spadix shortly stalked, straight, rather longer than the spathe. *l.* shining above, pale beneath, ovate-oblong, 6in. to 8in. long, apiculate, cordate at base; petioles terete. Caudex thick. *h.* 4ft. to 5ft. Rio de Janeiro.

A. magnificum (magnificent). *fl.*, spathe green, short, oblong, recurved; spadix green, cylindrical; scape terete, rather shorter than the petioles. *l.* deeply cordate-ovate, abruptly acuminate, with large, rounded basal lobes; petioles tetragonal; stipules ovate-oblong. Cundinamarca. (R. G. 508.)

A. Mooreanum (Moore's). *fl.*, spathe purplish-green, 4in. to 4½in. long, linear-oblong, acuminate; spadix olive-brown, 5in. to 6in. long, slightly tapering; peduncle as long as the petioles. *l.* sub-hastate, 1ft. long, on petioles 1½ft. long. 1886. A hybrid between *A. crystallinum* and *A. subsignatum*, of no remarkable beauty.

A. mortfontanense (Mortefontaine).* *fl.*, spathe crimson, large, cordate; spadix whitish. *l.* elongated, cordate-oyate. 1885. An ornamental hybrid between *A. Andreanum* and *A. Veitchii*. (R. H. 1886, pp. 50, 156.) *A. leodiense* is very similar to this.

A. Ortgiesii (Ortgies'). *fl.*, spathe rather small, deep red; spadix yellowish. 1889. A garden hybrid between *A. Andreanum* and *A. Lindenianum*. (R. G. 1293 d.)

A. Paradisæ (Paradise Nursery). A garden hybrid between *A. Andreanum* and *A. ornatum*. 1891.

A. Patini (Patin's). A synonym of *Spathiphyllum Patini*.

A. pumilum (dwarf). *fl.*, spathe rounded, resembling in colour that of *A. Scherzerianum Rothschildianum*, but with more scarlet. 1896. A garden seedling or hybrid.

A. punctatum (dotted). *fl.*, spathe reddish above, green beneath, changing to greyish-green or purplish-green, spreading or reflexed, 3½in. to 4½in. long, linear-oblong, cuspidate-acuminate, the margins revolute; spadix olive-green, 6in. to 9in. long, slightly tapering; peduncle 1ft. to 1½ft. long. *l.* 14in. to 20in. long, 2¾in. to 4½in. broad, elongate-oblong, rather abruptly acute, cuneate at base, dark green above, paler and blackish-dotted beneath; petioles 6in. to 8in. long, acutely channelled down the face. Ecuador, 1836.

A. purpureum (purple). *fl.*, spathe purple on both sides, suffused green at the base, 4½in. long, 1in. broad, spreading or reflexed, more or less curled; spadix dark violet-purple, 6in. or more long, ¼in. thick. *l.* coriaceous, green, 1½ft. long, 5¾in. broad, oblong-lanceolate, acute at apex, cuneate-acute at base; petioles 3in. to 6in. long, shallowly channelled. Stem ascending. Brazil, 1837.

A. Ridolfianum album (Ridolf's white). *fl.*, spathe white, large; spadix pink. 1891. A garden hybrid; parentage not stated.

A. Roezlii (Roezl's). *fl.*, spathe snow-white, elliptic, 4in. long, long-cuspidate at apex; spadix white, distinctly stalked, scarcely longer than the spathe. *l.* cordate- or roundish-ovate, rugosely undulated, 16in. long; petioles slender, terete, 1½ft. to 2½ft. long. Colombian Andes.

A. rotundispathum (round-spathed). *fl.*, spathe roundish; spadix deep yellow. *l.* of a bright green. 1891. A hybrid between *A. Andreanum* and *A. Lindenianum*. (I. H. xxxviii., t. 119.)

A. rubrinervium (red-nerved). *fl.* very sweet-scented; spathe glaucous-green, 4in. to 6in. long, narrow-lanceolate, much spreading or recurved; peduncle reddish, 1½ft. to 2ft. long. *l.* cordate-sagittate, 12in. to 14in. long, narrowed to a long-triangular apex; young ones having reddish nerves; petioles rather longer than the leaves. Venezuela, 1820. SYNS. *Pothos rubrinervia*, *P. sagittata* (B. M. 1384).

A. salmoneum (salmon). A garden hybrid between *A. Lindenianum* and *A. Andreanum*. (I. H. 1895, t. 42.)

A. Sanderianum (Sander's). *fl.*, spathe large, shield-shaped, foliaceous. 1895. A seedling related to *A. Andreanum*.

A. Scherzerianum (Flamingo Flower) **albo-lineatum** (lined with white). A garden variety. 1888.

A. S. andegavense (Angers). *fl.*, spathe scarlet on the back, dotted with white, white within, splashed with scarlet; spadix yellow. 1883. A handsome form, resembling *Rothschildianum*. (F. d. S. 2454-5.)

A. S. atropurpureum (dark purple). *fl.*, spathe dark crimson-scarlet, roundish, large. 1894. A beautiful Aroid.

A. S. atrosanguineum (dark bloody). *fl.*, spathe rich crimson. 1888.

A. S. bispathaceum (two-spathed). A curious garden variety, having two red spathes placed opposite each other. 1890. (I. H. xxxvii., t. 107.)

A. S. bruxellense (Brussels). *fl.*, spathe and scape rich scarlet; spadix orange. *l.* lanceolate, tapering to the apex. 1887. (I. H. ser. v. 18.)

A. S. compactum (compact). *fl.*, spathe white, thickly blotched with coral-red, almost circular. 1895. (G. M. 1895, p. 244.)

A. S. Duvivierianum (Duvivier's). *fl.*, spathe white.

A. S. giganteum (gigantic). *fl.*, spathe 5in. to 6in. long, and in some cases 4in. across. Costa Rica. A brilliant variety.

A. S. lacteum (milk-white). *fl.*, spathe milk-white; spadix orange. 1886. (I. H. 1886, 607, under name of *A. album maximum flavescens*.)

A. S. maximum album (largest white). A seedling variety, with large, white spathes. 1890. (I. H. xxxvii., t. 100.)

A. S. mutabilis (changeable). *fl.*, spathe at first white, gradually becoming scarlet. 1882.

A. S. nebulosum (cloud-like). *fl.*, spathe white, dusted with red, double. 1888.

A. S. parisiense (Parisian). *fl.*, spathe of a beautiful salmon-pink; spadix brilliant orange. *l.* deep green, lanceolate,

Anthurium—*continued.*

gradually tapering to the acute apex. 1887. A robust, compact plant. (I. H. ser. v. 16.)

A. S. roseum (rosy). *fl.*, spathe of a salmon-rose colour. 1893.

A. S. Rothschildianum. The name *elegans* has been applied to what is apparently a strong-growing form; *maximum* is another sub-variety. 1896.

A. S. rotundiflorum sanguineum (round-flowered, blood-coloured). *fl.*, spathe deep blood-red. 1894.

A. S. sanguineum (blood-coloured). *fl.*, spathe dark-crimson. 1893.

A. S. Senateur Montefiore Levis. *fl.*, spathe French white, long and round, profusely dotted with intense scarlet, the dots in clusters around the margins and down the centre. 1898.

A. S. Vervaeneum (Vervaene's). A handsome, white-spathed variety. 1884. (R. H. 1884, p. 204.)

A. S. Wardii (Ward's). *fl.*, spathe of the most brilliant scarlet, 6in. long, 4in. broad. A magnificent variety.

A. S. Waroqueanum (Waroque's). *fl.*, spathe white, dotted with red; spadix yellow. 1888. This does not appear to differ from the variety *Rothschildianum.* (I. H. xxxv., t. 51.)

A. S. Woodbridgei (Woodbridge's). *fl.*, spathe of the most intense crimson-scarlet, broad, nearly 6in. long. *l.* dark green, spreading. 1882. One of the finest forms.

A. subulatum (awl-like). *fl.*, spathe white, spreading, oblong, ending in a long, subulate point; spadix purplish-red, stout; peduncle 9in. to 12in. long. *l.* dark green, elongated, cordate-ovate, cuspidate-acuminate at apex. Caudex short. Colombia, 1886. A distinct and rather ornamental species.

A. trifidum (thrice-cleft). *fl.*, spadix shortly stipitate, slender, terete; spathe reddish, reflexed, oblong-lanceolate; peduncle erect, red or reddish-brown, shorter than the petioles. *l.* 10in. to 15in. long, broadly and deeply trifid; lateral lobes obliquely oblong-ovate, obtuse, somewhat falciform, shorter than the median lobe; petioles elongated. Origin uncertain. 1876. (B. M. 6339.)

A. Veitchii acuminatum (acuminate-leaved). A variety having ovate-lanceolate, acuminate leaves. Colombia, 1885.

A. Wambekeanum (Wambeke's). A garden hybrid between *A. Lindeni* and *A. Andreanum.* 1895.

A. Wittmackii (Wittmack's).* *fl.*, spathe of a lovely deep rose-colour, 2½in. long; spadix purplish, almost cylindrical. 1889. A garden hybrid between *A. Andreanum* and *A. Lindenianum.* (R. G. 1293 c.)

Other hybrids, &c.; are: *Adriani, Crombezianum, Hanburyanum, Laingi, londinense, Palmeri, Ricasolianum, rosæflorum, roseum, Torrigianum, Valvassorii.*

ANTHYLLIS. About a score species are included in this genus; they are found in Europe, Western Asia, and North Africa, *A. Vulneraria* being the British representative.

A. cretica (Cretan). A synonym of *Eb nus cretica.*

A. Erinacea (Erinacea). The correct name is *Erinacea pungens.*

ANTIDESMEÆ. Included under **Euphorbiaceæ** (which *see*).

ANTIGONON. The three or four species, natives of Mexico and Central America, are very difficult to distinguish as such. To those described on p. 88, Vol. I., the following variety should be added:

A. leptopus albiflora (white-flowered). This variety differs from the type in having white flowers. 1888.

ANTIRRHINEÆ. A tribe of **Scrophularineæ** (which *see*).

ANTIRRHINUM. Including *Asarina.* About twenty-five species of annual or (mostly) perennial herbs, rarely sub-shrubby, sometimes twining, are included in this genus; they are broadly dispersed over the Northern hemisphere, *A. majus* and *A. Orontium* (Lesser Snapdragon) being British plants; the former, however, is not a true native, but an escape from cultivation. To those described on pp. 88-9, Vol. I., the following should be added:

A. glutinosum (glutinous).* *fl.* very pale yellowish-white, rather large, axillary, erect, the lip slightly striped with red. July. *l.* alternate, shortly petiolate, elliptic-oblong or elliptic-ovate, obtuse at both ends. Branches very fragile. Spain, 1892. A prostrate, glandular-pilose, half-hardy perennial. (B. M. 7285.)

A. Nuttallianum (Nuttall's). *fl.* purple, axillary, pedicellate, the tube of the corolla not longer than the spreading lips. *l.* ovate or sub-cordate, nearly all distinctly petiolate, the lower ones about 1in. long, the upper ones smaller. *h.* 1ft. to 2ft. California, 1888. Half-hardy annual. (R. G. 1888, t. 1275, f. 3.)

ANTIRRHŒA [also spelt *Antirhea*] (from *anti*, against, and *rheein*, to flow; in allusion to the use of the plant as a styptic). ORD. *Rubiaceæ.* A genus embracing about a score species of stove, highly glabrous trees and shrubs, natives of the West Indies, Mauritius, China, and tropical Australia. **Stenostomum** is included hereunder by Bentham and Hooker, and the only members of the genus that have been introduced to gardens will be found described under that heading.

ANTISPILA PFEIFFERELLA. *See* **Vine Moths.**

ANTITHESIA PRUNIANA. *See* **Plum Insects.**

ANTLER MOTH, or **GRASS MOTH** (*Charæas graminis*). This is a most unwelcome visitor to grass, as the caterpillars do immense damage when they assert themselves, as they frequently do, in large numbers. On the Continent they are regarded as amongst the worst Grass pests which have to be encountered; while now and again here they are unusually numerous. Belonging to the *Noctuidæ*, the Moths are rarely seen. The ravages, however, of the larvæ are readily traced.

The Moth itself is on the wing in early autumn. It is about 1½in. in the wing-expanse, and has brownish or reddish fore-wings, with markings which have been somewhat fancifully likened unto the branches of antlers. The hind-wings are small, greyish, and fringed with a paler colour. Pairing takes place soon after emergence, and, according to some authorities, the female deposits eggs to the number of 300. The larvæ are hatched out in the following spring, and soon make good use of their opportunities They live at the roots of their food-plants (thus being safe from insecticides), and preferably select the soft kinds of Grass. They are brownish, with some lighter stripes along the back, while there is also a light-coloured line in the spiracular region; they are much wrinkled. When the larvæ are full-fed, they pupate in the earth in an ingeniously constructed oval cocoon. The pupæ are blackish-brown and shining.

Remedies. With larvæ feeding as these do, it is practically impossible to suggest remedial measures. On the Continent firing the herbage has been found effectual. During autumn, too, the sweep-net may be utilised with advantage in the evening, and the perfect insects destroyed. Insectivorous birds, like crows and starlings, also devour large numbers, and should be encouraged. The caterpillars, although generally attacking Grass, occasionally turn their attention to Corn.

ANTONIANA. A synonym of **Faramea** (which *see*).

ANTROPHYUM. This genus includes *Scoliosorus.* When planted out in the warm fernery, Antrophyums make very distinct objects, and are especially valuable for growing in comparatively dark places. All are slow growers; but their fronds possess very lasting qualities. Propagation may be effected by means of the spores, which are produced in abundance; but this being a very slow process, Antrophyums are usually increased by division of their crowns in March or April. To the species described on p. 89, Vol. I., the following should be added:

A. Lessonii (Lesson's). A synonym of *A. Plantagineum.*

A. plantagineum (Plantain-like). *sti.* 1in. to 4in. long. *fronds* 6in. to 9in. long, 1½in. to 2in. broad, thick, coriaceous, sharply pointed, narrowed below; areolæ sometimes 3in. long, ¼in. broad. *sori* copious, deeply immersed, often uniting. India, &c. See Fig. 51. SYN. *A. Lessonii.*

ANTRORSE. Tending in an upward or forward direction.

ANTS. In Vol. I. some little space is devoted to a consideration of the life-history of these industrious insects. The labour of keeping them down will, however, be somewhat minimised if a still more extensive glance at their communities be taken. Reference has already been

Ants—*continued.*

made to the fact that there are three different individuals to be met with in colonies of these social insects—males, females, and workers. Primarily the object of the first two is the perpetuation of their kind; while that of the last is to act not only as food-foragers for the larvæ, but also as nurses to them and to the pupæ. The larvæ are absolutely helpless, and were it not for the good offices of the workers they would perish soon after emergence from the minute eggs. Here it may be as well to state that the so-called Ants' eggs of commerce are nothing more nor less than the pupæ of certain species, which make for themselves a silken cocoon. It is these which one sees very carefully carried about when a colony is disturbed.

The larvæ are whitish, footless maggots, and, as above stated, they have to be fed and moved about by the workers. In the pupal state the creatures have still to be looked after by the workers, even to the extent of being helped out of the skins in which they passed that portion of their life-cycle. In many other ways the workers render help, until the newly-emerged insects are generally familiar with the life of the colony. Unlike Social Bees and Wasps, Ants elaborate no cells for the reception of their larvæ.

Ants in the garden are readily combatted by persistently employing one or other of the remedies suggested in Vol. I., p. 89. Those, however, inhabiting our plant-houses, and with which an interchange of commerce has presented us, are not so readily dislodged. The fact is, heat is absolutely necessary for their well being at certain seasons of the year in our changeable climate; hence the reason of their affecting warm greenhouses, &c. Here they destroy the vital parts of flowers, causing them to die away prematurely.

To exterminate them trapping must be resorted to, and that at the opportune moment. The workers, or

FIG. 51. ANTROPHYUM PLANTAGINEUM.

Ants—*continued.*

rather some few of them, will be in evidence all the year, but the time to set the traps is in spring, when the young brood is hatched and food is absolutely necessary for their up-bringing. Then it is that the workers will be found in the greatest numbers industriously foraging for food for their charges. Now is the time for the traps. These should consist of old pieces of sponge, which should be dipped into a syrupy liquid and laid about their haunts. The sponges must be taken up periodically and plunged into boiling water. Care must be taken to wash out of them the dead bodies, and then they must again be set. In time all the workers will have been attracted, and will perish. The larvæ have still to be catered for, and the other members of the colony will have to venture forth in order to save the larvæ from perishing, only, however, to share the fate of their relatives. And in the end the whole colony will have succumbed if the trapping is persisted in. Large bones containing a little meat may also be placed in the haunts of the insects, which should be brushed off into boiling water.

Some of the Wood-Ants are very destructive to timber. Their method is to enter the trees through some kind of wound, and when once inside they tunnel in all directions, and in the end the trees rot and die. By way of an Ant-destroyer the Ballikinrain may be recommended.

ANUBIAS (name not explained by its author). ORD. *Aroideæ*. A small genus (three or four species) of stove, evergreen perennials, with a short stem, natives of Western tropical Africa. Flowers monœcious, on an inappendiculate, stalked spadix; spathe green, thick, convolute below, accrescent and persistent, but the blade deciduous; peduncle elongated. Leaves lanceolate, acute or sagittate-cordate at base; petioles elongated, long-sheathing. Only one species has been introduced. For culture, *see* **Alocasia** (to which this genus is closely allied).

A. heterophylla (variable-leaved). *fl.* small. *l.* about 1ft. long, 3in. broad, bright green, blotched with dull yellow, 8in. to 12in. long, 4in. to 6in. broad; petioles 12in. to 16in. long. Congo, 1889.

AOPLA. Included under **Herminium** (which *see*).

APALANTHE. A synonym of **Elodea** (which *see*).

APARGIA. A synonym of **Leontodon** (which *see*).

APATURIA. Included under **Pachystoma** (which *see*).

APEIBA. SYN. *Aubletia* (of Schreber). This genus includes five species, all tropical American.

APERA (from *aperos*, undivided; alluding to the flower-glume, which is entire). SYN. *Anemagrostis*. ORD. *Gramineæ*. A small genus (two species) of hardy, annual, rather tall Grasses, natives of Europe and Western Asia. Spikelets one-flowered, small, loosely paniculate; glumes three, the two lower ones empty; panicle terminal, very elegant, ample, diffuse or contracted, with numerous filiform branchlets. Leaves narrow, flat. For culture, *see* **Agrostis**.

A. arundinacea (Arundo-like). A synonym of *Stipa arundinacea*.

A. Spica-venti. The correct name of *Agrostis Spica-venti*.

APHÆREMA (name not explained by its author), ORD. *Samydaceæ*. A monotypic genus. The species is a small, erect, stove shrub or under-shrub, requiring similar culture to **Rivina** (which *see*).

A. spicata (spicate). *fl.* golden-yellow, small, in solitary, terminal, slender, erect racemes; stamens eight, twelve, or sixteen, perigynous. *l.* opposite, 2in. to 3in. long, shortly petiolate, ovate-cordate, obtusely acuminate, crenate-serrate, with six to eight pairs of deeply-impressed nerves. South Brazil, 1896. (B. M. 7393.)

APHANAMIXIS. *See* **Amoora.**

APHANOSTEPHUS. *See* **Leucopsidium.**

APHELANDRA. Syns. *Hemisandra*, *Synandra*. Bentham and Hooker include hereunder *Hydromestes* and *Strobilorachis*, but the latter has been kept distinct on p. 519, Vol. III., of this work. Nearly fifty species have been noted; they inhabit tropical and sub-tropical America, from the Argentine Republic as far as Mexico. To those described on pp. 90-1, Vol. I., the following should be added:

A. amœna (pleasing). A garden name for *A. Blanchetiana.*

A. atrovirens (dark green). *fl.* in a terminal, sessile, sub-cylindrical spike; corolla fulvous-yellow, nearly 1in. long; bracts green, six to seven lines long, closely appressed. *l.* 3½in. to 4½in. long, 1¾in. to 2½in. broad, elliptic or elliptic-ovate, rather obtuse, decurrent at base, crenate, very dark green and shining above, violet-purple beneath. Bahia, 1884. Plant dwarf. (I. H. 1884, 527.)

A. Blanchetiana (Blanchet's). *fl.* golden-yellow, the tube as long as the sepals but shorter than the crimson bracts which are 1½in. long; spike sessile. August. *l.* ovate, acute, many-nerved, narrowed at base to a short petiole. Stem thick, tall. Brazil, 1838. (B. M. 7179.) Syn. *A. amœna* (of gardens).

A. Chamissoniana (Chamisso's). The correct name of *A. punctata.* (B. M. 6627.)

A. chrysops (golden-eyed). A synonym of *A. squarrosa Leopoldii.*

A. dubia (doubtful). *fl.* of a deep red. 1894. A garden hybrid. (I. H. 1894, t. 15.)

A. fulgens (brilliant). *fl.* orange-coloured. Autumn. *h.* 1½ft. Mexico, 1847. (R. H. 1847, p. 21.)

A. glabrata (glabrous). *fl.* yellow; bracts ovate, acute, entire. Autumn. *l.* oblong, attenuated at both ends, slightly repand, cuneate at base, sessile, shining. Stems whitish when adult. South America, 1843.

A. Leopoldii is a variety of *A. squarrosa.* Syn. *A. chrysops.*

A. Liboniana (Libon's). *fl.* deep yellow, red at the apex, small, scarcely exserted; bracts bright orange, large, arranged in four rows; spike sessile, 5in. to 6in. long. *l.* 9in. or more in length, deep green with a central white line, suddenly acuminate, entire; petioles 2in. to 3in. long. Brazil, 1864. (B. M. 5463.)

A. Macedoiana (Macedo Costa's). *l.* elliptic-ovate, sub-obtuse, dark green above, the nerves margined with very pale whitish-green, the under-surface violet-purple. 1886. (I. H. 1886, 583.)

A. Margaritæ (Mdlle. Marguerite Closon's).* *fl.* bright orange or apricot-colour, growing in short, terminal spikes from between pectinate bracts. *l.* decussate, shortly stalked, elliptic, the upper surface marked with about half-a-dozen oblique bars of white on each side the midrib, the under-surface clear rose-colour. Central America (?), 1884. (B. H. 1883, 19; G. C. ser. iii., vol. ii., p. 585.)

A. ornata (adorned). *fl.* bright yellow; bracts tinged with purple, large, hairy. *l.* gradually narrowed to the base, dark green, with a distinct central paler band, ciliated; midrib purple on the under-surface. Bahia, 1858. (B. H. 1865, t. 3; J. B. 1864, p. 289.)

A. prismatica (prismatic). The correct name of *Strobilorachis prismatica.*

A. pumila splendens (splendid). This pretty form differs from the type in having acute, green bracts. 1883. (R. G. 1104.)

A. squarrosa (squarrose). *fl.* yellow, in terminal, solitary or ternate spikes; corolla 1½in. long; bracts orange, densely imbricated, 1in. to 1½in. long. *l.* crowded, elliptic, acuminate, cuneate at base, 10in. to 12in. long. Brazil. A showy, herbaceous species, of which there are two varieties, *citrina* (F. d. S. 809) and *Leopoldii* (the latter described as *A. Leopoldii* in Vol. I.).

A. sulphurea (sulphur-yellow). *fl.* of a dark or golden sulphur colour; corolla tube protruding ¾in. beyond the bract, the limb 1½in. across; spike 5in. to 8in. long. *l.* 6in. to 9in. long, broadly elliptic or elliptic-ovate, abruptly acuminate; petioles stout, ½in. to ¾in. long. Stem terete, erect, sparingly branched. Guayaquil, 1872. (B. M. 5951.)

A. tetragona (four-angled). The correct name of *A. cristata.* (B. R. 1277.)

A. t. grandis (large). *fl.*, spike crowded at the apex of the stem; rachis densely woolly. September. *l.* (with the 1½in. petioles) nearly 1ft. long, 4in. broad, with a long, tail-like point. Merida, Venezuela.

A. t. imperialis (imperial). *fl.* scarlet, four times as long as the brownish bracts; spikes terminal. *l.* ovate, acute. Central America, 1891. (R. G. 1354.)

APHELENCUS FRAGARIÆ. *See* **Eelworms.**

APHELEXIS. Bentham and Hooker refer this genus to **Helichrysum** (which *see*).

APHIDES are amongst the commonest and most widely distributed of all garden insects, and are popularly known as Greenfly; though why it is difficult to imagine, seeing that many species are very far from even approximating to that colour. In this country quite 200 species are found, and this fact alone is sufficient to invest the family with some little importance even despite the unenviable reputation which it bears with the gardener and the agriculturist. To it again belong several of the most destructive insects known to horticulture, and in support of this one only needs to instance the Grape Phylloxera and the American Blight, or Woolly Aphis, each of which is dealt with under its respective heading. Years ago before economic entomology began to make its influence felt, the visitations of Aphides, together with many fungoid diseases of plants, were vaguely ascribed to "blight."

From a cursory glance at Aphides one would be tempted to think that such fragile-looking creatures would be readily disposed of either by a very severe winter or by great and successive weather changes. That they are not, however, must be apparent to those who have paid but comparatively little attention to a complex subject. First as to weather influences. That a few viviparous females are more likely to be preserved to carry on the cycle during a mild than during a severe winter is true; but, on the other hand, it must be remembered that certain very destructive species have been observed in an active condition even during the prevalence of 11deg. of frost. Dry, hot weather is most favourable to the increase of the insects, as during copious showers they get dislodged from their hiding-places, and are frequently killed. Aphides constitute quite as formidable pests of greenhouse and orchard-house plants as they are of outdoor plants, though because of the restricted area under cultivation in the former case they are more readily dealt with.

All species of Aphides do not feed exposed. Some, like those found upon the Bean, are exposed to view; while others live for the most part in the curled-up leaves of their food-plant. Again, while many infest the leaves, others, like the Apple Aphis (*A. mali*), attack both flowers and leaves. Some, too—the Woolly Aphis and the Grape Louse—feed upon the roots; and two common species at least, feeding upon Currants, are responsible for blister-like galls, due to the irritation set up by their punctures. These are *Myzus ribis* and *Rhopalosiphum ribis.*

Apart, too, from the injury certain Aphides inflict upon the plants by extracting the sap therefrom by means of their sucker-mouths, they are also objectionable by reason of the fact that they exude a sweet, sticky secretion, popularly called "honeydew," which, together with the excreta, so block up the pores of the leaves that they are quite incapable of fulfilling their proper functions, and the tree or plant suffers accordingly. Of the honeydew-secreting Aphides some of the most familiar are *Pterocallis tiliæ*, the species found upon Limes; *A. pruni* upon the Plum; and *A. brassicæ* and *A. rapæ* upon turnips, cabbages, &c.

The Lime is not alone among ornamental trees which is attacked, and badly attacked, by Aphides of the honeydew-secreting kinds. The beautiful Copper Beech, which of late years has become such a favourite in gardens, is a great sufferer from *Phyllaphis fagi*, which is allied to that found upon the Lime. It is a green species, but being covered with a whitish substance its body-colour is not often noticed. The eyes are red and prominent. The Common Beech is also subject to similar attacks. The Larch, again, has its particular Aphis (*Chermes laricis*), but the damage done is not so great as is the case with some of the other species. The eggs are laid in spring, and the newly-hatched larvæ at once commence upon the young leaves.

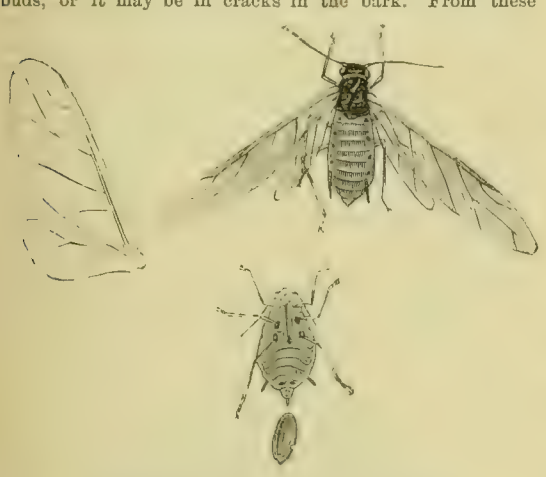
Many Aphides exhibit impartial tastes in the matter of food-plant, for when one is not available another, and

Aphides—*continued.*

that of a widely different order, suffices; and this accommodating taste no doubt stands such species in good stead. It is not, for instance, generally known that *Aphis pruni* infests not only the Plum (with which its specific name identifies it) and most other orchard and wall fruit-trees, but also Composites like Chrysanthemums and Asters; or that the Lettuce Aphis (*Siphonophora lactucæ*) will feed upon the Currant or Gooseberry; and so of many others. Equally worthy of notice is a phase in the life-history of that pest the Hop Aphis (*Phorodon humuli*), which in the autumn (September) forsakes that plant to take up its abode upon the Plum, from which in turn it migrates again to the Hop in spring. It is upon the Plum that the winter is passed in the egg-state. This is not, however, the only means by which this species is increased, for Nature has ordained that certain of the females should remain impervious to winter's cold, and in the early spring bring forth living young.

To describe in detail all the species against which the gardener is called upon to wage war would occupy too much space without a corresponding advantage accruing, especially as the methods of dealing with all are practically identical, though some species, by reason of their habits, are not so readily reached as are others. Some of the commonest and most destructive kinds are:

Apple Aphis (*A. mali*). This insect varies considerably with the different individuals found (Fig. 52). The eggs are laid in late summer in the vicinity of the buds, or it may be in cracks in the bark. From these



(By Permission of the Board of Agriculture.)

FIG. 52. APPLE APHIS (APHIS MALI). Showing Fore- and Hind-wings; Winged Viviparous Female; and Oviparous Female. (All magnified.)

hatch out in early spring the viviparous females alluded to in Vol. I., and these continue the round of life there depicted. The first symptoms of attack are a curling of the leaves, which almost invariably blacken and fall. Colour, some shade of green.

Bean Aphis (*Aphis rumicis*). This is also known as Black Fly, Dolphin Fly, and is very abundant upon Broad Beans. *See* **Bean Fly.**

Cherry Fly (*Myzus cerasi*). Although the specific name indicates the Cherry as the object of this insect's attack, the pest by no means restricts its attention to that tree, but occasionally also lays under contribution Currants as well. This is another black species. It mostly congregates on the under-surfaces of the leaves, though at times nearly every part of the tree is involved. A tree badly attacked by this insect is a sight not

Aphides—*continued.*

likely to be forgotten, for what with the excreta and the sticky secretion which has been exuded, the leaves, &c., present a most unhealthy appearance. The attack is made in spring and is long-continued, so that the drain upon the tree's resources is considerable.

Currant Aphides (*Myzus ribis* and *Rhopalosiphum ribis*). Besides the occasional Aphis visitor to the Currant noted above, there are two very troublesome pests in the Currant Aphides proper. These are greenish or yellowish in all stages, and approach one another so closely that no one but an expert would be able to separate the two species. Both kinds are to be found upon the under-surfaces of the Red and the Black Currant. These they attack, causing a reddish or reddish-yellow blister-like swelling to form; they sometimes entirely disfigure the leaves. If leaves showing blisters are lifted, they will usually be found to shelter the pests in the vicinity of the gall-like structures. Currant Aphides commence their depredations in spring, as soon as the new leaves are unfolded, and if remedial measures are not adopted, the fruit crop will be considerably endangered.

Hop and Plum Aphis (*Phorodon humuli*). This is a pale green kind, too well known to need a detailed description; while a brief sketch of its peculiar life-history has already been given. (See also **Phorodon humuli,** Vol. III.).

Pea Aphis. *See* **Pea Pests.**

Peach Aphis (*Aphis amygdali*). This reddish-yellow Aphis occasions much mischief to Peaches by blocking up the breathing-pores of the leaves with its secretions. Often, however, it is credited as well with the injury wrought by the Peach-Curl Fungus, because present at the same time.

Plum Aphis (*Aphis pruni*) is another green or yellowish-green species, very abundant upon the under-surfaces of Plum foliage. It also attacks the Peach and the Apricot. In all cases the leaves if badly-attacked "curl," and they are, moreover, covered with "honeydew," and are rendered most unsightly. The "curl" of the leaves in the case of Peaches must not be confounded with that brought about by the fungus *Exoascus deformans*, though the two not infrequently co-exist.

Rose Aphis. *See* **Rose.**

Woolly Aphis (*Schizoneura lanigera*). *See* **American Blight.**

Remedies. Before the gardener can satisfactorily deal with any insect pest, he must first of all determine how it feeds. It is useless, for instance, spraying on to trees powerful poisons if they are not likely to bring about the desired result—the diminution of the pest attacked. This, however, is frequently done, more especially with sap-sucking insects like these under notice. Now it cannot be too well known that, unlike in the case of chewing insects, poisoning the food-plant is not of the slightest use for Aphides. These creatures, by the aid of their rostra, actually bore through the poison before they begin to suck, and therefore to simply spray the tree would be labour wasted. To be really effective, the insecticide must be something which kills by contact, and there is nothing really better for the majority of Aphides than some tobacco-water or the soft-soap and quassia-chip solution recommended in Vol. I. The chief difficulty in dealing with attacks of Aphides is in the case of tall trees, for although powerful spraying-machines are now upon the market, they would hardly reach the larger ornamental trees used in the decoration of our parks and gardens, and these must be left to Nature to remedy. Most Fruit-trees and the smaller decorative subjects may, of course, be thoroughly sprayed. To ensure the greatest success spray directly the insects are noticed, and use the mixture lukewarm, as it has been found of far

Aphides—*continued.*

greater utility than when applied cold. Even warm water or soapsuds will have a cleansing effect upon the leaves, and will also be the means of killing a number of the enemy if directed with energy early in the spring. Tree-trunks may also with advantage be washed; while in the case of American Blight special treatment will be necessary, as advocated under that heading. Abol is another excellent insecticide to employ against Aphides.

The gardener is ably seconded in his efforts to keep down Aphides by many insects, but principally by several of the Ladybirds and their larvæ, which devour vast quantities. Equally useful are the Lacewing Flies, Stink Flies, or Golden Eyes. These beautiful, but fragile-looking, creatures are amongst the Aphides greatest natural enemies, and should be preserved at all costs. The eggs are fairly conspicuous, and are laid at the end of a long stalk, sometimes singly, at others in a cluster. The larvæ of some species of Lacewing Flies clothe themselves with the bodies of the Aphides, presenting a curious appearance. This is also the case with some of the *Hemerobiidæ*, which are close allies of the Lacewing Flies (which *see*). Then there are one or two species of Hover-Flies (*Syrphidae*) that render the gardener excellent service. The leech-like larvæ are very remarkable in their movements, and we have it on the excellent authority of that careful observer, Mr. Enock, that a single Hover-Fly larva has destroyed over 120 Aphides in an hour. Other insects that tend to lessen the gardener's labours are the parasitic *Hymenoptera*, of the families *Chalcididæ* and *Ichneumonidæ*. Gardeners should learn to recognise the Aphides which have been visited by the parasites of the families noted. Usually they have isolated themselves from their relatives, have assumed a dull, or even whitish hue, and aldermanic proportions. Such specimens should be left severely alone, as they almost invariably contain the egg, or perhaps the immature larva, of one of the parasites, which, as soon as it has assumed the perfect state, will make its way through the skin of the unfortunate host that for a time has given it shelter. Nor must the birds be forgotten, several of the commoner species being exceptionally fond of Aphides.

Indoors the XL All Vaporiser and Liquid might be used with advantage; and in the case of fruits a good syringing night and morning with hot water would doubtless be sufficient.

APHILOTHRIX GEMMÆ. *See* **Oak Galls.**

APHLOIA (from *a*, privative, and *phlois*, bark; alluding to a peculiarity of one of the species, called by the French colonists Bois sans Écorce). ORD. *Bixineæ*. A small genus (three species) of stove, evergreen trees or shrubs, natives of the Mascarene Islands. Flowers hermaphrodite, axillary, sessile or shortly pedicellate; sepals four or five, broadly imbricated; petals wanting; stamens numerous. Leaves entire, serrated or toothed. Only one species calls for mention. For culture, *see* **Ludia.**

A. mauritiana (Mauritian). The correct name of *Ludia heterophylla.*

APHYLAX. A synonym of **Aneilema** (which *see*).

APIACEÆ. Lindley's name for the **Umbelliferæ** (which *see*).

APIS MELLIFICA. *See* **Honey Bee.**

APISTA. A synonym of **Podochilus** (which *see*).

APIUM. Petals entire; umbels compound. Leaves dissected. In addition to the Celery (*A. graveolens*) and Celeriac (*A. g. rapaceum*), the following variety may be mentioned:

A. graveolens tricolor (three-coloured). *l.* glossy green, striped down the centre with a silvery-grey band, and margined with creamy-white. 1882.

APLOCARYA. A synonyn of **Dolia** (which *see*).

APLOPAPPUS. *See* **Haplopappus.**

APLOPHYLLUM. Included under **Ruta** (which *see*).

APODOLIRION (from *a*, privative, *podos*, a foot, and *Lirion*, a Lily; in allusion to the peduncles being short and hidden). ORD. *Amaryllideæ*. A genus embracing half-a-dozen species of greenhouse, bulbous plants, natives of South Africa. Flowers white or reddish, as large as a Crocus; perianth funnel-shaped, with a long tube and six sub-equal, ascending segments; stamens in two rows near the throat; peduncle short, hidden in the neck of the bulb, one-flowered. Leaves narrow, not usually produced with the flowers. Only two species call for mention here. They thrive in a mixture of sandy loam and peat, and may be propagated by offsets or by seeds.

A. Ettæ (Miss Etta Stainbank's). *fl.*, perianth tube 3in. long, the limb white, tinged with red, 1in. to 1¼in. long; anthers in two superposed rows. *l.* (and bulb) like those of a Crocus. 1894.

A. lanceolatum (lance-shaped). The correct name of *Gethyllis lanceolata.*

APONOGETON. SYN. *Spathium* (of Edgworth). *Ouvirandra* (see p. 535, Vol. II.) is included by Bentham and Hooker under this genus, which comprises about a score species of stove, greenhouse, or half-hardy, scapigerous, submerged, Aquatic herbs, inhabiting tropical and temperate Asia and Africa, and Australia. Flowers white, or rarely pink or violet, hermaphrodite, spicate; perianth segments (or bracts) two or three, rarely one or wanting, petaloid; spikes solitary or twin, sessile at the apex of the scape. Leaves long-petiolate, oblong or linear, erect or swimming.

In the Lattice-leaf Plant, *A. fenestrale*, lovers of tender Aquatic Plants have a gem which well repays for the extra attention its culture entails. The treatment, according to Mr. Baker, of the Oxford Botanic Gardens, is as follow: In order to produce a luxuriant growth it must not be included in a tank with Aquatics that require abundance of light and sunshine. A tub, about 3ft. in diameter and 1½ft. in depth, is a very suitable receptacle in which to cultivate it. This should be situated in a warm plant-house in a position where the light can be subdued and the temperature of the water maintained at from 60deg. to 65deg. in the winter, and from 70deg. to 75deg. during the summer months. A suitable compost consists in good fibrous loam, a little leaf-soil, with a good sprinkling of coarse silver sand. An 8in. or 10in. pot is sufficiently large to accommodate a good-sized specimen, and the soil should be pressed firmly into the pot, afterwards covering the surface with small white stones or spar, to keep the soil from rising in the water: these also serve another purpose, by displaying to better advantage the formation of the leaves. The crown of the plant should be submerged about 2in. beneath the surface of the water. It is most important that the water be clean and as free from sediment as possible, rain-water being far preferable; further, it should not be allowed to become stagnant, or confervoid growths will make their appearance, and injure the plant. To prevent this as far as possible, some of the water should be drawn off about once a week by means of a siphon, and the tub filled up with fresh water of about the same temperature. If this does not check their appearance, a good method is to cover up the plant and exclude all light for a few days, when the confervoid growths may be easily syringed off and flushed over the rim of the tub. It is beneficial to the plant for the tub to be filled to overflowing by adding a little fresh water every day by means of a watering-can with a fine rose; or the same result may be attained (excepting that there is a continual slight agitation of the water) by a constant drip conducted by means of a siphon from another vessel situated at a higher level. This will cause the water to run over at the sides, and any dirt that may have become deposited on the surface will be thus removed.

Aponogeton—*continued.*

The propagation of the Lattice-leaf Plant is effected by means of divisions of the root-stock and also by seeds. It is rather a capricious subject to cultivate, for treatment that suits it in one place sometimes disagrees with it in another, which perhaps may be owing to foreign matter held in suspension by the water. As is the case with many other plants, its successful cultivation greatly depends on apparently trifling details, but a well-grown specimen is a unique object of beauty, deserving all the attention that can be bestowed upon it.

To the species described on p. 93, Vol. I., the following should be added:

A. angustifolium (narrow-leaved). *fl.* pale red; bracts white; stamens six; spike bifid, few-flowered. July. *l.* linear-lanceolate, submerged, opaque, variable in size. South Africa, 1788. (B. M. 1268.)

A. distachyon Lagrangei (Lagrange's). A form with white and rosy-flesh-coloured bracts, flushed with green at the base. 1895. (R. H. 1895, p. 380.)

A. d. monostachyon (single-spiked). The correct name of *A. monostachyon.* (A. B. R. 46.)

A. d. roseum (rosy). A charming variety, having rosy-tinted flowers. 1885.

A. fenestrale. This is the correct name of the plant described as *Ouvirandra fenestralis.*

APORIA CRATÆGI. *See* **Lepidoptera.**

APORUM. Included under **Dendrobium** (which *see*).

APPENDAGE. Any superadded or subordinate part; *e.g.*, thorns, hairs, &c., on a stem.

APPENDICULA (from *appendix;* in allusion to the appendage at the base of the lip). SYNS. *Conchochilus, Metachilum.* ORD. *Orchideæ.* A genus embracing about a score species of stove, epiphytal Orchids, with tufted, leafy stems, natives of tropical Asia, Australia, and Polynesia. Flowers usually minute; sepals connivent, the lateral ones connate at base and adnate to the produced foot of the column, forming a mentum; petals variable; lip erect, inserted on the foot of the column or with its sides adnate thereto; column very short, the rostellum erect, bifid. About four species have been introduced, but they are of no horticultural value.

APPLE. Since the work was issued the following are some of the most noteworthy introductions and additions:

Allen's Everlasting. Dessert. Fruit medium; flavour very good. It succeeds best as a bush or pyramid tree. April and May.

FIG. 53. ALLINGTON PIPPIN APPLE.

Allington Pippin. Dessert. Fruit medium, yellow, with red streaks on the sunny side; flavour very rich and agreeable. November to January. A promising new variety. See Fig. 53.

American Mother. *See* **Mother.**

Baumann's Red Winter Reinette. Dessert or Kitchen. Fruit rather large, flatish round; skin nearly covered with a brilliant deep-red, intensified on the exposed side. April and May. The tree is a good grower and a free bearer, but of second-rate flavour. See Fig. 54

FIG. 54. BAUMANN'S RED WINTER REINETTE APPLE.

Beauty of Bath. Dessert. Fruit medium, beautifully coloured, and of handsome shape; flavour rich and agreeable. Good bearer; one of the best early dessert apples. July and August.

Belle de Pontoise. Kitchen. Fruit large, somewhat approaching a Blenheim in shape, and highly coloured. A variety of much promise. Great bearer; small trees fruiting freely. December to April.

Bismarck. Kitchen. Fruit large, richly coloured, and of fine shape. A new variety from Tasmania, and one which has already proved a decided acquisition, being an enormous bearer hardy, and vigorous. October to January.

Blenheim Orange. *See* **Blenheim Pippin.**

FIG. 55. BLUE PEARMAIN APPLE.

Blue Pearmain. Dessert. Fruit over medium size, inclined to be conical; skin green, flushed with red on the exposed side, and covered with a delicate blue bloom similar to that of a black grape. A new variety of delicious flavour, keeping sound until May. The tree is a moderate grower, but has not yet proved free-bearing. See Fig. 55.

Bramley's Seedling. Kitchen. Fruit very large, rather flat, solid; first-class for cooking. Good bearer, succeeding equally well as a bush or as a standard. December to May. See Fig. 56.

Byford Wonder. Kitchen. Fruit very large, palé yellow, solid; great bearer. February and March.

D. T. Fish. This is now regarded as synonymous with **Warner's King** (which *see*).

Early Peach. Dessert. A compact-growing and more prolific form of the well-known **Irish Peach Apple** (which *see*). August

Early Rivers. Kitchen. Fruit large, firm. A good bearer. July and August. A fine, early, cooking apple.

Ecklinville Seedling. Kitchen. A very large, handsome variety, of good shape; a splendid cooker, and an extraordinary bearer on all forms of trees. See Fig. 57.

Apple—*continued.*

FIG. 56. BRAMLEY'S SEEDLING APPLE.

Gascoigne's Scarlet Seedling (SYN. *Glory of England*). Kitchen or Dessert. Fruit large and beautifully coloured; very crisp and pleasant in flavour. Great bearer. November to February.

Glory of England. *See* **Gascoigne's Scarlet Seedling.**

FIG. 57. ECKLINVILLE SEEDLING APPLE.

Golden Noble. Kitchen. Fruit large and handsome, of a rich golden colour. A constant and prolific bearer. November and December. This is a fine variety, and distinct from Waltham Abbey Seedling, which is sometimes sold for it. See Fig. 58.

FIG. 58. GOLDEN NOBLE APPLE.

Apple—*continued.*

Golden Spire. Kitchen. Fruit large, conical, straw-coloured; a first-rate cooker, and a constant and heavy bearer, far superior to the old Keswick Codlin, whose place it should take. August to November. An excellent market variety.

Grenadier. Kitchen. Fruit large, yellow, crisp, and sub-acid. Constant and good bearer. September and October.

Hambling's Seedling. Kitchen. Fruit large and handsome, green, flushed with red on the sunny side; flesh firm and of good flavour, and useful for dessert in season of scarcity. December to April.

King of Tompkins Co. Dessert. Fruit large and handsome, richly coloured on the sunny side; flavour very good and sweet. Good bearer on the Paradise stock, and only suited for bush or wall trees. November to March.

Lady Sudeley. Dessert. Fruit medium, bright red, except where shaded; flesh soft, crisp, and highly-flavoured if eaten as soon as ripe. Good and constant bearer. August and September. This variety should not be heavily pruned, as the finest fruits are produced at the points of the shoots.

FIG. 59. LANE'S PRINCE ALBERT APPLE.

Lane's Prince Albert. Kitchen. Fruit large, and of perfect shape, one of the firmest and heaviest apples, with crisp and pleasant flavour. An enormous bearer. November to May. This variety is specially suited for small gardens, as it crops most profusely on bush trees. One of the best market apples. See Fig. 59.

Loddington Seedling. *See* **Stone's Apple.**

Margil. Dessert. Fruit medium, red on the sunny side; flavour crisp and delicious. October and November. This variety answers best on warm soils, and on the Paradise stock.

Mother (SYN. *American Mother*). Dessert. Fruit above medium size, highly-coloured on the sunny side; flavour sweet and very crisp. September and October. One of the finest dessert apples on warm soils. A good bearer on bush trees.

Newton Wonder. Kitchen. Fruit large, and of good shape, flushed on the sunny side with red; flavour sub-acid and brisk.

FIG. 60. NEWTON WONDER APPLE.

EUCRYPHIA PINNATIFOLIA.

Apple—*continued.*

November to May. It is a sturdy grower, great bearer, very heavy, and will prove a valuable market apple. See Fig. 60.

Pearmain, Christmas. Kitchen. Fruit medium, rich colour, and pleasant, crisp flavour; equally good for dessert. Great bearer. November to January. A promising new variety.

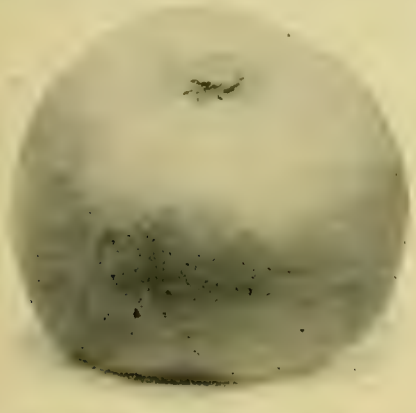


FIG. 61. PEASGOOD'S NONSUCH APPLE.

Peasgood's Nonsuch. Kitchen. Fruit very large, of perfect shape, and fine colour; flavour very brisk and agreeable. Moderate bearer. October to December. The most imposing and finest exhibition apple, but a spreading grower, and should not be closely pruned. See Fig. 61.

Potts' Seedling. Kitchen. Fruit large, of a pale straw colour; flesh soft, crisp, and juicy. A great and constant bearer. August to October. The best variety for town gardens or smoky districts.

Queen Caroline (SYN. *Spencer's Seedling*). Kitchen. Fruit medium to large, of perfect shape, yellow, with minute brown spots all over; flavour sub-acid and juicy. A good bearer and compact grower. October to December.

Roundway Magnum Bonum. Dessert. Fruit medium, russety; flavour excellent. Good bearer. November to March.

Russet, Egremont. Dessert. Fruit medium, and of good shape; flavour rich and crisp. Good bearer and compact grower. October to December. This is the best of the Russet class.

Sandringham. Kitchen. Fruit large, greenish; flavour brisk. Good bearer. November to January.

Spencer's Seedling. *See* **Queen Caroline.**

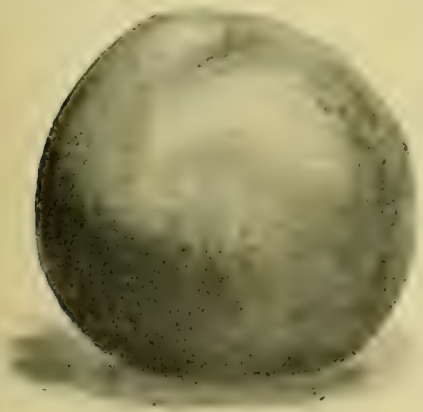


FIG. 62. STIRLING CASTLE APPLE.

Stirling Castle. Kitchen. Fruit large, green, firm; flavour brisk and excellent for cooking. An extraordinary bearer, and most suitable for growing as a bush tree. October to December. See Fig. 62.

Stone's Apple (SYN. *Loddington Seedling*). Kitchen. Fruit large, yellow, flushed with red, firm; flavour sub-acid and crisp. Good bearer August to December. A splendid variety for bush or standard trees.

Apple—*continued.*

The Queen. Kitchen. Fruit large, flat, covered with red stripes, firm, and of good flavour. Good bearer. October to January.

Tyler's Kernel. Kitchen. Fruit large, conical, bright red on the sunny side; flavour rather acid. Great bearer on established standard trees December to February.

FIG. 63. WEALTHY APPLE.

Wealthy. Kitchen or Dessert. Fruit medium, handsome form, and fine red colour. Good bearer on bush trees. October to December. An American variety, of rich flavour. See Fig. 63.

White Transparent. Kitchen or Dessert. Fruit medium, conical, of a beautiful straw colour, flesh soft; flavour brisk and very juicy. A great and constant bearer. July and August. This is one of the finest early apples, and valuable for market.

For Cordons the best are: ALLEN'S EVERLASTING, BEAUTY OF BATH, BELLE DE PONTOISE, BISMARCK, COX'S ORANGE PIPPIN, ECKLINVILLE SEEDLING, EGREMONT, GOLDEN SPIRE, HAWTHORNDEN, LANE'S PRINCE ALBERT, LORD SUFFIELD, MARGIL, MOTHER APPLE, NEWTON WONDER, POTTS' SEEDLING, QUEEN CAROLINE, RIBSTON PIPPIN, RUSSET, STIRLING CASTLE, and WHITE TRANSPARENT.

For Pyramidal, Bush, and Espalier Trees the following are all of proved merit: ADAM'S PEARMAIN, ASHMEAD'S KERNEL, BEAUTY OF BATH, CORNISH GILLYFLOWER, COX'S ORANGE PIPPIN, EARLY PEACH, EGREMONT RUSSET, IRISH PEACH, JAMES GRIEVE, KEDDLESTONE PIPPIN, KERRY PIPPIN, KING OF THE PIPPINS, KING OF TOMPKINS CO., LADY SUDELEY, MARGIL, MOTHER APPLE, RED INGESTRE, RED QUARRENDEN, RHINETTE DU CANADA, RIBSTON PIPPIN, ROUNDWAY MAGNUM BONUM, ROSS NONPAREIL, SCARLET NONPAREIL, STURMER PIPPIN, SYKE HOUSE RUSSET, WEALTHY, and WINTER QUEENING..

The following are Kitchen sorts, well adapted for this restricted method: ALFRISTON, BEDFORDSHIRE FOUNDLING, BELLE DE PONTOISE, BISMARCK, BRAMLEY'S SEEDLING, BYFORD WONDER, COX'S POMONA, DUCHESS OF OLDENBURGH, DUMELOW'S SEEDLING, ECKLINVILLE SEEDLING, GASCOIGNE'S SCARLET SEEDLING, GOLDEN NOBLE, GOLDEN SPIRE, LANE'S PRINCE ALBERT, LORD SUFFIELD, MANX CODLIN, NEWTON WONDER, NEW HAWTHORNDEN, PEASGOOD NONSUCH, POTTS' SEEDLING, QUEEN CAROLINE, SANDRINGHAM, STIRLING CASTLE, TOWER OF GLAMMIS, TYLER'S KERNEL, WARNER'S KING, and WHITE TRANSPARENT.

For Standard Trees, or Orchard Planting, the following are excellent varieties: ALFRISTON, ALLINGTON PIPPIN, BEAUTY OF BATH, BELLE DE PONTOISE, BESS POOL, BISMARCK, BLENHEIM ORANGE, BRAMLEY'S SEEDLING, BYFORD WONDER, COX'S POMONA, DUKE OF DEVONSHIRE, DUMELOW'S SEEDLING, ECKLINVILLE SEEDLING, GASCOIGNE'S SCARLET SEEDLING, GOLDEN NOBLE, GOLDEN SPIRE, LADY HENNIKER, MÈRE DE MÉNAGE, NEWTON WONDER, PEASGOOD'S NONSUCH, POTTS' SEEDLING, TOWER OF GLAMMIS, TYLER'S KERNEL, WARNER'S KING, WEALTHY, WINTER QUEENING, and WORCESTER PEARMAIN.

For Cold and Exposed Situations: ALFRISTON, BRAMLEY'S SEEDLING, CLAYGATE PEARMAIN, ECKLINVILLE SEEDLING, DUKE OF DEVONSHIRE, FRENCH CRAB, GOLDEN SPIRE, KESWICK CODLIN IMPROVED, MANX CODLIN, NEWTON WONDER, NORTHERN GREENING, STURMER PIPPIN, TOWER OF GLAMMIS, and WARNER'S KING.

For Cottage Gardens: BISMARCK, BRAMLEY'S SEEDLING, DUCHESS OF OLDENBURGH, ECKLINVILLE SEEDLING, GOLDEN SPIRE, KING OF THE PIPPINS, LANE'S PRINCE ALBERT, NEW HAWTHORNDEN, POTTS' SEEDLING, STIRLING CASTLE, WHITE TRANSPARENT, WINTER STRAWBERRY, and WORCESTER PEARMAIN

APPLE AND PEAR BLIGHT.—All sorts and conditions of trees are popularly supposed to be susceptible to "blight." The name has been handed down from the Dark Ages to indicate certain conditions of plants, such as those which have died away almost entirely as if blasted, but the true cause of which to the average individual is obscure. By many certain atmospheric conditions are thought to be entirely due to blight; while in country places, Aphides are collectively spoken of as blight. Fungi, strange to say, though frequently the cause of decay in trees, are less often suspected. Indeed, there are very large numbers who will not believe that the condition, generally known as Canker in Apple Trees, is due to a most insidious fungus, which finds its way into bark wounds and quickly spreads.

In North America, however, there is a condition of Apple and Pear Trees which has earned for itself the popular appellation above adopted. It is due to a most destructive disease, supposed to be brought about by the presence of bacteria. Apple and Pear Trees are commonly attacked; but the disease by no means restricts itself to such, being found upon many of the ornamental species of the genus *Pyrus* and its very near allies. Burrill, of Illinois, made some extensive investigations, and published the result of such in the "American Naturalist" of 1881, He has been followed by several able workers in the same field, one of the most exhaustive reports appearing in the "Year Book of the United States' Department of Agriculture for 1895." It was contributed by Mr. Warlie. Still, it cannot be said for certain that Apple and Pear Blight is due to bacteria.

The indications are first seen on the bark. They are small dead patches, which increase rapidly in size, and involve maybe the whole of the tree. There is a wholesale exudation of the sap, and trees so attacked present a most unhealthy appearance, what with the dead portions and the partial or entire defoliation which occurs. Hartig says that "the disease appears to bear resemblance to the tree-canker produced by *Nectria ditissima*, and as in the case of this fungus, large numbers of small gonidia, resembling bacteria, are produced in the cortex." Though the disease is at present confined to America, it is of such a virulent nature that its chief symptoms, at any rate, should be known to pomologists. Removal and burning of the diseased portions is the way to prevent the spread of the disease.

APPLE APHIS (*Aphis mali*). *See* **Aphides.**

APPLE-BARK BEETLE (*Xyleborus dispar; Bostrichus dispar*). Under this somewhat inappropriate name are known in gardens some destructive little Beetles of a dark brown or, in some cases, of an almost black colour, found upon Apple, Pear, Plum, and other trees. The injury they do is considerable, though the work of destruction is not in evidence until the affected branches or stems are opened, disclosing the numerous galleries. These galleries if examined will be found coated with a whitish substance, out of which grows a fungus, upon which they feed; this is called Ambrosia. The Beetles differ considerably as to size and form, the females (⅛in.) being much larger than the males, which are not as often in evidence. It is only of recent years that this species has appeared in sufficient numbers to be troublesome. The insects are on the wing in late spring, and the female then selects a suitable branch in which to bore and deposit her eggs. Both young and old, healthy and weakly, trees are selected; and the Beetles may be suspected if the shot-like holes (responsible for the very appropriate name of "Shot-Borers") are noticed. Such holes are really the exits from their galleries, just as are the so-called "wormholes" of another destructive Beetle, commonly found in furniture.

Beetles which feed protected in the interior of tree-trunks and branches are not readily reached by the

Apple-Bark Beetle—*continued.*

ordinary insecticides. In America, where the Beetle is terribly destructive, the stopping up of their exit-holes is recommended, using a wash made of soft soap and a strong solution of washing soda in water of the consistency of paint. This (says the Report of the Entomologist to the Canadian Agricultural Department) should be applied on the morning of a warm day, when it will dry in a few hours, forming a tenacious coating.

APPLE-BLOSSOM WEEVIL (*Anthonomus pomorum*). Though small (about 5mm.) this insect (Fig. 64) is very destructive at times to the unexpanded blossom buds of Apple and Pear in early spring. Notwithstanding the number of improved methods for coping with certain Beetles which have been introduced within recent years, there is no better way of dealing with this pest than by shaking or jarring infested trees, killing all the Beetles which are found, and *burning* all withered blossoms, as such are likely to contain the insect in some stage of its existence. In winter, too, the old bark may be removed and burnt, and the trunk sprayed with the potash and soda preparation advocated for **American Blight.** Where the soil can be constantly moved it is of great benefit to allow poultry to run amongst the trees, and if these are vigorously shaken while the larvæ are in the blossoms numbers will be dislodged and be devoured by the poultry.

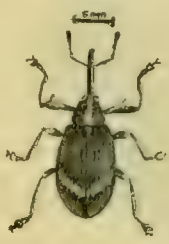


FIG. 64. APPLE BLOSSOM WEEVIL (*Anthonomus pomorum.*)

APPLE GALL. *See* **Vine Galls.**

APPLE, GOLDEN. *See* **Ægle.**

APPLE MAGGOT (*Trypeta pomonella*). This insect has only within recent years asserted itself in numbers. It belongs to the *Diptera*. In America it is one of the pests which Apple-growers have to reckon with, and in some seasons it has proved very destructive. In appearance the perfect insect might well pass for a small house-fly, were it not that its brilliant and prominent eyes at once differentiated it from that household pest. The general body-colour is black, with whitish dots and bands, which latter also traverse the wings. The female may be distinguished from her mate by the flat ovipositor.

These small insects are upon the wing in early summer. The Apples are at that time of good size. The eggs are laid one at a time, the female piercing the skin of the fruit with her sharp ovipositor; and as she is estimated to lay on the average some 300 or 400 eggs, the amount of harm a few of these flies is capable of working may be readily recognised. The eggs hatch out in from four to six days, and the larvæ are full-fed in about as many weeks. They at once begin to feed upon the food ready to hand, and the work of the half-grown maggots is well shown in Fig. 65, *a*. When mature they assume the chrysalis state, either just beneath the surface of the ground, or frequently, in the case of stored fruit, in the bins or barrels, emerging as perfect insects at the time stated. The insects are difficult to combat, and recourse must be had to preventive measures, such as the collection of all fallen fruit, and the burning of all accumulations from bins, barrels, and store-rooms. Those interested in the study of this insect will find it fully dealt with by Professor F. L. Harvey, in the Annual Report of the Maine Agricultural Experiment Station in 1890, and two of whose admirable figures are here reproduced. See Fig. 65.

APPLE OR CODLIN MOTH (*Carpocapsa pomonella*). Everyone practically is acquainted with the maggoty condition of Apples, for which the Codlin Moth is

Apple or Codlin Moth—*continued.*

responsible, though many are still unacquainted with the perfect insect itself. The Codlin Moth, though usually found on the Apple, is not over particular, as it has been recorded from Pears, Plums, Apricots, Peaches, Spanish Chestnuts, and even Walnuts. This last, did it not emanate from so sterling an entomologist as Mr. Adkin, many, perhaps, would be inclined to doubt. In some countries this insect is double-brooded; but here, happily, it is single-brooded.

From time to time all sorts of methods have been suggested for dealing with the Codlin Moth, but none so effective as spraying with Paris Green, and if used with care there is no danger. That this arsenite is a virulent

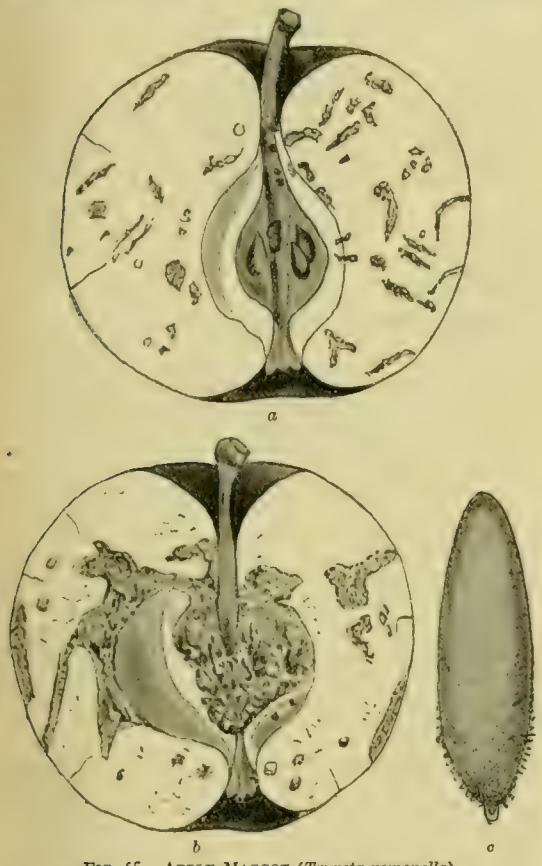


FIG. 65. APPLE MAGGOT (*Trypeta pomonella*).
a, Work of Half-grown Larvæ; *b*, Full-grown Larvæ (Natural Size); *c*, Egg (Greatly Enlarged).

poison cannot be too widely known, any more than can its utility in destroying this pest of the orchard and the garden. Dwarf trees are, of course, the easiest to deal with; but standard trees might also be reached with a good machine. The great things to remember are to use the Paris Green in the proportion of 1oz. to 20gall. of water, and to spray as soon as the blossoms have fallen. Paris Green may be procured from some firms mixed into a kind of paste; this is safer for mixing than the dry powder. Spraying with Paris Green should be in combination with cleanliness about the garden, the use of haybands (as advocated in Vol. I.), and the periodical cleansing of the trunk in winter. Even where cattle are grazing, the arsenite in the proportions suggested may be employed with safety. As a means of prevention, all fruits which show signs of infestation should be burned.

APPLE MUSSEL SCALE (*Mytilaspis pomorum*). This very common brown Scale is rather difficult to deal with when once it has attached itself to its food-plant. It is one of the most familiar pests to the fruit cultivator, by reason of the peculiar form of the covering, or scale, (Fig. 66), which has been exuded by the mother insect. The Scales are sucking insects, and are best therefore killed by contact. A Californian grower (Mr. Maxwell Heron) recommends the following winter treatment: Take 25lb. of unslaked lime, 20lb. of sulphur, 15lb. of salt, and 60gall. of water. Place 10lb. of the lime and all the sulphur with 20gall. of water in a copper, and boil until all the sulphur is dissolved. Then take the remainder of the lime and the salt, slake it, and add enough water to make 60gall. Apply this when warm through a syringe, keeping the mixture well stirred. If this be used, he says, when the tree is dormant, it is perfectly harmless to the buds. In addition to its value as an insecticide it is of benefit as a fungicide. The mixture may, of course, be made in smaller quantities, so long as the due proportions are observed. As before stated, once the insect has attached itself to the bark it is difficult to dislodge, on account of its protective covering. In winter, too, when the trees are dormant, great benefit will be derived by spraying with potash and caustic soda, as advised for **American Blight.**

FIG. 66. APPLE MUSSEL SCALE.

The best time to fight it is in late spring (May), when the young insects are on the wander. Then a soapy wash containing a little tobacco water will be found of great benefit. So, too, would a weak solution of kerosene emulsion.

Gishurst's Compound Soap is a most effective Scale insecticide, employed at the rate of 4oz. to 1gall. of water. Hot water of a temperature of 150deg. may also be successfully used in the spring, and is perfectly safe. Of recent years cyanide of potassium fumes have been recommended for Scale, but this insecticide cannot be generally recommended on account of its dangerous nature.

The Apple Mussel Scale (so-called) is identical with the Oyster Shell Bark Louse, which gives such trouble to American fruit-growers. Curtis's old name for this insect, *Aspidiotus conchiformis*, is now regarded by scientists as a useless synonym. Though usually associated with the Apple, this species is a very general feeder, and may be found upon Pears, Currants, Raspberries, and many of the hardy outdoor shrubs, such as Cotoneasters and Heaths. It undoubtedly, however, shows a marked partiality for Apples; hence the origin of the popular name.

APPLE POWDERY MILDEW. This disease has not yet been recorded in this country; but in America it causes the fruit-grower considerable loss. The fungus responsible for the mischief is *Podosphæra oxyacantha*. It is a mildew not far removed from the familiar *Sphærotheca pannosa* on Roses. The foliage of young Apples is chiefly attacked, and their whole surface is covered. The fungus has a very debilitating effect upon the trees. The area of infection is rapidly increased by means of the conida, or summer spores; while winter spores are also

Apple Powdery Mildew—*continued.*

produced, and these carry it over the winter. Many other *Rosaceæ* are attacked by this undesirable fungus-visitor to a nursery or plantation of young trees—Cherry, Peach, Hawthorn, Mountain-Ash, and Medlar. Stems as well as leaves are coated with the mildew. In very bad attacks the foliage is shed prematurely, and the seedling plants make little or no progress. All affected leaves should be collected and burnt; while, as soon as the disease is noticed, the trees should be treated to a solution of sulphide of potassium (1oz. to 3gall. of water).

APPLE ROT. This condition of Apples must be familiar do everyone, though its causes are to the majority obscure. It is, however, due to a well-characterised fungus —*Glœosporium fructigenum.* Popularly the disease is known as Apple Rot; but it is not restricted to that fruit, being found upon Pears, Peaches, Plums, &c. Sometimes it is called Ripe Rot, or Bitter Rot (the latter being a peculiarly appropriate name). Usually it is only observed by growers after the fruits have fallen, when perhaps nearly full-grown; or, may be, it is not observed until some time after the fruits have been stored. Frequently, however, Apples are attacked when comparatively young, and the disease not being readily noticed—at any rate, in the case of standard trees—it rapidly spreads. All parts of the fruits are liable to attack, though, as is the case with several other diseases, the calyx end is first involved. The symptoms, even at the outset, are fairly well marked, as the fruits are spotted with brown. The spots increase in size and coalesce as growth proceeds, and give place to large patches. If the disease is allowed to run, a very large proportion of the crop will be contaminated, and its market value will be practically nil. As the disease progresses, blackish pustules are formed over the whole surface of the skin; these rupture and release the spores, which increase the trouble. Inside the condition of the fruit is still worse, for the mycelium has completely broken down the tissues, and the familiar rotten condition and bitter taste are the result.

Once the disease has attacked the fruits, all Apples showing symptoms of the fungus should be removed and burnt before they arrive at that stage when the spores will be scattered by various agencies. All that is practical is to prevent the further spread of the disease, which is best done by spraying the trees at intervals with either Bordeaux Mixture or sulphide of potassium (1oz. to 3gall. of water). All fruits which fall and show signs of spotting should be burnt. In the case of Apples stored, it will be very necessary to go over them frequently, destroying all that are "spotted," as the disease spreads just as rapidly, under favourable conditions, when the fruits are off the trees. In America the disease assumes even more serious proportions than here.

APPLE SAWFLY (*Hoplocampa testudinea*). Though not as well known as many of the insects which infest fruit trees, yet the creature under notice is at times exceedingly troublesome to gardeners. Frequently, however, its depredations are put down to other insects, especially to the Codlin Moth. There are ten species of this genus found in Britain, but only the one above-named calls for notice here. The perfect insects are only about 12mm. in wing-expanse, and of a reddish-yellow colour. They are on the wing in early spring, the female depositing her eggs in the blossoms of the Apple. In due time the grubs hatch out, and make their way into the young Apple. Outwardly there is no indication of the presence of these pests, and it is not until the fallen immature fruits are examined that the depredators are disclosed.

All such Apples as fall early should be at once collected and burned. If left on the ground undisturbed, as they

Apple Sawfly—*continued.*

not infrequently are, the grubs, about the first week in July, eat their way out and pupate in the ground in cocoons.

Prevention is the only method of dealing with this pest. It is of little use attempting to treat the trees to an insecticide at such a season as the Sawflies themselves are on the wing, as the blossoms would be injured thereby, and the crop further endangered.

By some entomologists this insect is known as *Tenthredo testudinea.*

APPLE AND PEAR SCAB (*Fusicladium pyrinum; F. dendriticum*). These very common pests to Pears and Apples are responsible for the condition known as "Cracking," and they have been dealt with at considerable length. (*See* **Pear-Fungi.**) At the time the article was written, however, the disease had baffled alike the grower and the scientist, and the loss to the former through the produce being rendered unsightly, and thus unsaleable, was enormous. More recent investigations have conclusively shown that the disease may be combatted, like many others of a similar character, by the judicious use of **Bordeaux Mixture** (which *see*). This fungicide to be effective must be sprayed on directly the new leaves are in evidence, using a very weak solution. The spraying should be repeated at intervals of three weeks, or a little less, until the fruit is formed. Leaves and shoots are also attacked.

APPLE-SHOOT MOTHS (*Laverna vinolentella; Argyresthia curvella*). The first species, a small moth under ½in. in wing-expanse, is now and again responsible for a deal of damage to Apple shoots. It must be classed as local and uncommon. In the Caversham district in 1898 it was very prevalent, and was most injurious to the young Apple trees there planted. The Moth is black, and has two deep black erect tufts of scales on each fore-wing. During the day it is not often seen, as then it sits upon the Apple trunks and branches, appearing on the wing towards sunset. The eggs are laid in July and hatched out in spring, the larvæ entering the shoots, causing them to die away. Directly this is noticed, all such dead shoots should be cut away and burned.

Argyresthia curvella is a trifle larger than the first-named species, and commoner, though by no means abundant. It is on the wing during June and July. The fore-wings are white, strigulated with a darkish brown, while there are a small, transverse dorsal mark, a narrow band from the middle of the costa to the centre of the back, and an irregularly-shaped dark blotch towards the apex of the wings. The hind-wings are grey. At rest these Moths appear as if standing on their heads, by reason of the fact that the hinder part is obliquely raised from the surface. The larva is hatched in May, and feeds in the shoots, which should be treated similarly to those attacked by the *Laverna* above noted.

APPLE-SUCKER (*Psylla mali*). Belonging to the same natural order (*Homoptera*) as the Aphides, or Plant Lice, is the destructive little creature above-named. Of recent years it has been very abundant wherever Apples are grown, and it has taxed the ingenuity of the most practical fruit-grower to keep it in check. In Germany it is a still greater pest. The insects extract the juices from their food-plants, hence the common name. The generic name (*Psylla*) is in allusion to the leaping power of the perfect insect.

The Apple Sucker is on the wing in late spring, but is so minute (2mm.) that it may readily escape observation. At pairing time it varies considerably as to colour—being green, with brownish-red, yellow, or red markings. The eggs are usually deposited singly, but sometimes in pairs, on the young twigs. The larvæ emerge in about a fortnight, and commence to feed upon the

Apple-Sucker *continued.*

unexpanded buds, at the same time covering them with a kind of sticky globules, popularly, but wrongly, described a "honeydew." This secretion, together with the excrement, quite prevents the buds from developing, especially if the season be a dry one. Between the deposition of the egg and the emergence of the perfect insect about a month elapses. During that time the larva changes its skin five times. At the end of the third moult the wings are plainly discernible, as shown in the

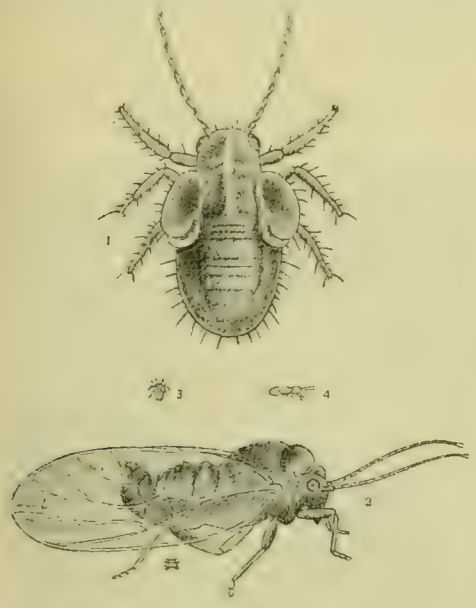


FIG. 67. APPLE SUCKER (*Psylla mali*), showing: 1, Larva (Magnified 14 diam.); 2, Perfect Insect (Magnified 10 diam.); 3, Larva (Natural Size); and 4, Perfect Insect (Natural Size).

illustration (Fig. 67). In the mature insect the wings are disposed roof-like, as shown in the illustration (Fig. 67). Those perfect insects which are to carry on the cycle of existence pass the winter under the bark of the tree.

Trees which are attacked soon show unmistakable symptoms. The foliage assumes a most unhealthy yellowish-green colour, and not infrequently prematurely falls. The blossom-buds also fail to set, and are shed in quantities.

By way of remedies the grower must depend entirely upon spraying, for which there is nothing equal to weak kerosene emulsion. This should be applied in April, directly the leaves show signs of opening. Several applications may be necessary throughout the season, for so far as at present is known the eggs are impervious to what may be termed safe insecticides. As an additional precaution the trees should also be similarly treated in winter, and all prunings should be burnt.

APPLE-TREE CANKER. *See* **Canker.**

APPRESSED, ADPRESSED. Lying close, *e.g.*, leaves Appressed to a stem.

APRICOT. To the varieties described in Vol. I., pp. 99-100, the following may now be added:

Alberge de Montgamet. A small, early, hardy, and prolific variety. Fruit deep yellow, fair flavour, and one of the best for preserving. Ripe at the end of July.

Beaugé. A late and good form of Moorpark. Ripe middle of September.

Apricot—*continued.*

D'Alsace. A glorified form of Moorpark. The fruit is larger, and equally as highly-flavoured. The tree is a vigorous grower, and not so liable to die away as Moorpark.

Early Moorpark. An early variety that ripens its fruit three weeks earlier than the original Moorpark, to which it is similar in growth and fruit. Ripe early in August.

Frogmore Early. Fruit small, deep orange in colour, with a good-flavoured flesh. Ripe early in July.

Golden Drop. One of the most delicious in flavour, with a rich melting flesh. Fruit small, deep orange in colour. As the trees acquire age they become very prolific. Ripe at the end of July.

Hemskerk. Somewhat similar to Moorpark, but the tree is hardier and more enduring. Ripe early in August.

La Délicieuse. A new variety from the East, stated to be of exquisite flavour.

Large Early. Fruit large, deep reddish-orange colour; flesh tender, melting, and richly flavoured. Ripe at the end of July.

New Large Early. A very early form of the Large Early.

Oullin's Early. An improved early form of Peach, but of larger size and exquisite flavour. An excellent free-bearing variety.

Pine Apple. Fruit large, deep yellow on the shaded side, and rich red cheek on the exposed side; flesh very tender, melting, and juicy, with a pleasing Pine-apple flavour. Ripe the middle of August.

Powell's Late. Fruit deep orange, flushed with red, large and abundantly produced; flesh sweet, juicy, and delicious. One of the hardiest and best varieties. Ripe early in September.

Roman. Fruit large, deep yellow, of brisk flavour; useful for preserving. A good bearer. Ripe the middle of August.

APRICOT WEEVIL, or RED-LEGGED GARDEN WEEVIL (*Otiorrhynchus tenebricosus*). If not as frequently met with in gardens as some of its near relatives, yet it is so destructive that every gardener should be familiar with it. Moreover, in certain parts of England (the south) it is a fairly common hedgerow insect. In the perfect state, this Beetle attacks all parts above ground of such trees as Apricots, Peaches, Nectarines, &c.; while the grubs sometimes damage the roots of Raspberries, Strawberries, and bush fruits like Currants. The Beetle (Fig. 68) is ½in. long, black, and covered with yellowish down. The legs are red.

FIG. 68. APRICOT WEEVIL (*Otiorrhynchus tenebricosus*).

Being nocturnal it is not often seen, for in the day-time it secretes itself in wall crevices, under rubbish, &c. Where its presence is suspected, the trees should be visited at night and shaken over a tar-covered paper. Like most other Weevils, this one drops readily on being disturbed, when it may be picked up and thrown into a vessel of boiling water. The necessity for filling up cracks and wall crevices will be obvious. *See also* **Otiorrhynchus.**

APTERA. This is one of the Natural Orders into which naturalists divide the important Class *Insecta*. The insects belonging thereto are very minute, soft-bodied creatures, destitute of wings, and with the mouth either mandibulate or imperfectly suctorial. The Order is again sub-divided into *Thysanura* and *Collembola*. None of the members of either sub-order call for extended notice, for though commonly found associated with garden produce they are perfectly harmless. Indeed, they may almost be considered useful scavengers, feeding as they do on the lower animal and vegetable life. The most familiar insects of the Order are those members of the *Collembola* which are capable of leaping, and on that account are popularly known as Springtails.

APTOSIMUM. The correct name of **Ohlendorffia** (which *see*).

AQUARTIA. Included under **Solanum** (which *see*).

AQUATIC PLANTS. No more beautiful phase of gardening can be named than the cultivation of Aquatics, though hitherto but little has been done by amateurs towards bringing this neglected group of plants into prominence. Some of the plants may be grown in very homely appliances, such as old barrels, cut in halves and sunk into the ground to within a few inches of their tops. For others large earthenware pans will suffice, so long as they are protected against frost. Of course, for the majority more elaborate vessels and culture are needed—large tanks (both indoors and outside), ponds, lakes, &c. The literature on the subject is scant, and for the bulk of the information here given we are indebted to Mr. W. G. Baker's (of Oxford) contribution to the "Book of Gardening."

Aquatic Plants—*continued.*

Figs. 69 and 70, is the great desideratum for exemplifying the admirable effects that can be produced by hardy Aquatic Plants when their cultivation is as skilfully undertaken as in the case of many other things. Even when everything has been carefully done that seems to be necessary to ensure establishing Nymphæas in large ponds or lakes, they are not then entirely free from casual mishaps. For instance, in a season of long-continued drought the water may sink to an abnormally low depth, and in receding from the plants leave their crowns exposed above its surface to endure an uncongenial element and its consequences.

In gardens where a natural lake or pond exists, provided it has an ample supply of water and an efficient outlet to prevent stagnation, a water garden might be formed, which, when judiciously planted, would become permanently

FIG. 69. THE LAKE AT KEW.

In numerous instances there may be already means at hand, in the form of tanks which have been constructed for the storage of water, that could be at once utilised for the reception of some of the many beautiful hardy Nymphæas now so readily obtainable; but it should be remembered that, excepting when the tank is of large dimensions, those of a neat habit will be preferable for this purpose to vigorous-growing kinds. The planting and arranging of them are largely discretionary, the use of tubs or boxes for the former being a matter of convenience, but in their arrangement, as far as practicable, the alternating of dark and light shades of colour may be generally depended on to produce a pleasing effect during their season of flowering. These observations are intended to apply to tanks already in existence.

The possession of ponds or lakes, such as shown at interesting and pretty, and in addition to providing a new feature, would impart additional beauty to the surroundings. It is not unusual to see a stagnant pond overgrown with rank vegetation that yearly adds to the decomposing mass of vegetable matter in its bed, yet there would probably be no great difficulty in converting a pond of this description into one of enduring prettiness. The margins and banks of streams afford excellent opportunities for establishing without much difficulty many plants that, in the course of time, would impart a pleasing effect to what might previously have been bare, uninteresting, or otherwise covered with indigenous coarse-growing vegetation.

Weeds should be removed as soon as they put in an appearance, for if allowed to become established, which they quickly do, some difficulty may be eventually experienced in eradicating them, and then not before they have either

Aquatic Plants—*continued.*

crippled the growth, or perhaps entirely destroyed other plants. In tanks, and also in ponds where there is but a slight current of water, various forms of confervoid algæ—green, thread-like vegetation, members of a low order of the Vegetable Kingdom—will sometimes make their appearance, more especially during warm weather; these, upon rising to the surface of the water, should at once be removed, or they will soon form dense masses, detrimental to the growth of the other occupants. If the Water Lilies are well furnished with foliage, the algæ would be less troublesome to deal with, and the introduction of a stock of fish would also prove very serviceable in keeping the same in check.

For the removal of dead leaves, weeds, or any accumulation of floating refuse, as well as to give the necessary attention to any plants requiring it in tanks

Aquatic Plants—*continued.*

visits, by destroying the buds and flowers of Water Lilies, but they may generally be captured without very much difficulty by means of tempting baits. Waterfowl might play havoc with small plants if unguarded, but it is most desirable that these should be grown in reserved quarters until sufficiently strong to plant out.

In selecting a site for an artificial piece of water it should be borne in mind that water naturally seeks its bed in low-lying ground; therefore, in the construction of a pond, it is very important that this particular should be observed wherever the conditions are favourable for doing so, or an unreal effect will otherwise be produced. The outline should be carefully considered, and circular or unnatural shapes should be avoided, as these would, to a cultivated taste, present a too artificial appearance. The sides should be represented by projections and

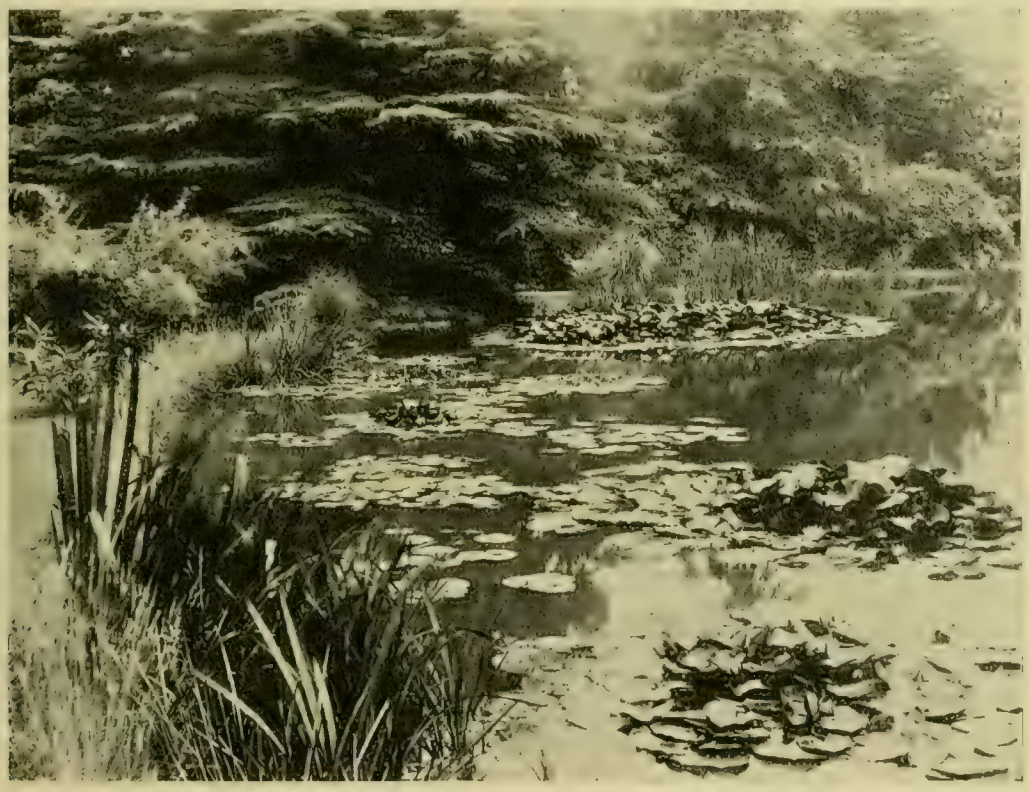


FIG. 70. HYBRID WATER LILIES AT GUNNERSBURY HOUSE, ACTON.

or small areas of water, a strong, light plank or ladder might be used of sufficient length to take a secure bearing at the ends; but in large ponds, where this is impracticable, wading-boots have to be resorted to.

Aquatics, more especially those with floating leaves, are fairly free from injurious attacks of insect pests, although sometimes they become affected with green and black Aphis. These can, however, generally be removed with the aid of a syringe or hose-spray; but the most effectual remedy is a natural one—a good heavy shower of rain, which also imparts to the plants an additional brightness. In some cases it may be desirable to use an insecticide, and should this be resorted to a solution of tobacco-juice will be found to answer the purpose effectually, without causing the least injury to the plants. Water-voles will sometimes become troublesome, if allowed to be undisturbed in their

irregular curves, avoiding the introduction of straight lines, which are invariably objectionable, and seldom occur in a natural formation. Artificial work, as far as possible, should be carefully concealed below the intended water-level line, or provision made for concealing it with vegetation when planting operations are in progress. If the soil is of a clayey nature and retentive of water where it is designed to form a pond, this work will be very much simplified; but should it be of a porous nature, then tempered clay will have to be introduced and puddling resorted to in order to prevent waste of water when the work is completed. When the soil has been excavated as deeply as may be desired—say to a minimum depth of about 3½ft. in the middle or deepest part, gradually diminishing to about 1½ft. at the margin, the sides sloping outwardly—the surface of the

Aquatic Plants—*continued.*

excavation should be made as firm as possible, and regularly finished off, ready for the puddling operation. To effect this, clay should be beaten and worked into a thoroughly tenacious mass wherever most convenient to do so, and when it is fit for use the bottom and sides of the pond should be evenly covered throughout with it to a thickness of 9in. to 12in. This will require to be well rammed and beaten as the work proceeds, so that it may be thoroughly united, and so prevent the water from percolating through it. This work should be done expeditiously, and as soon as it is completed the water should be gradually admitted. Of course, cement concrete might be used for lining the interiors of small ponds, but in the case of larger ones this would be a rather expensive process in comparison with puddling with clay. After the puddling operation is completed, the deepest part in the pond would be from 2½ft. to 3ft., and this would form the most suitable position for depositing the necessary mounds of soil for the reception of Nuphars and the more vigorous-growing Nymphæas that may be selected, the margin being suited to the requirements of those plants that only require shallow water in which to grow.

In supplying an artificial pond with water, it is very important that the source from which it is obtained should be considered, as Aquatics, and more especially the choicer kinds of hardy Nymphæas, do not flourish satisfactorily in continually running water of a low temperature, as by a continuous current of cold water entering the pond, and this observation applies particularly to the *odorata* group. Therefore, for the benefit of the plants, every provision possible should be made to ensure as high and as constant a temperature as possible, more especially during the time that the plants are in active growth. A pond situated in a sheltered, sunny position provides the best aspect, especially so for those of tender habit, and it would conduce to a greater prolongation of their flowering period. Where a sufficient, constant, and steady supply can be laid on from an extraneous lake, river, or stream, it will be of great advantage to do so, this being more beneficial to the health of the plants than that supplied direct from a natural spring or drawn from a low-level in the earth. The water obtained from the last-named sources is of too chilly a nature to favour a luxuriant growth, whereas the former would obviously best meet the plants' requirements, it being aërated and, consequently, of a higher temperature. The inrush of any considerable quantity of water should also be avoided, as the disturbance caused thereby is calculated to be detrimental to their well doing. All that is really required is a sufficient supply of water to prevent stagnation, and, when this is well regulated, successful culture will be in a great measure assured. Means should also be taken to prevent the level of the water from fluctuating to any appreciable extent by constructing an outlet at the intended water-level line, which will suffice for carrying off a similar quantity of water to that which enters the pond.

Where an opportunity is afforded of forming a small pond in connection with a well-made rockery, provided one does not already exist, if properly constructed and judiciously planted, it will form an additional charm to that always interesting and attractive feature in a garden. In its formation an irregular outline should be observed, as this would be conducive to its presenting a natural, and therefore more pleasing, appearance when completed.

In gardens of limited space brick, stone, or concrete tanks about 2½ft. in depth might be constructed, and these, if built entirely in the ground with the walls gradually sloping outwardly at the top, would minimise the risk of their being damaged during a long spell of severe frosty weather. A sunny position should be selected, and the site and formation of a tank of this description should be carefully considered in connection with the surroundings. In its construction a natural effect should be aimed

Aquatic Plants—*continued.*

at as much as possible, so that it will not present a too formal appearance.

A supply of water might be laid on by means of pipes, to which a valve should be fitted, so that the volume of water entering the tank may be regulated. The higher the mean temperature at which the water can be maintained in the tank, the more generally beneficial will it be for the plants. Only sufficient fresh water need be allowed to enter to prevent stagnation. An efficient outlet is also a necessity, and this should be situated at the intended water-level line to prevent any appreciable fluctuation. In favour of tanks it may be urged, without in any way depreciating the value of ponds, that they afford better facilities for more closely viewing the beauty of the Water Lilies than is the case when the plants are situated in large pieces of water.

Ordinary tanks or fountain-basins, where they already exist, if of sufficient depth and dimensions, would be available, although their stiff, artificial appearance makes them less pleasing to the eye in comparison with those which are designed on more natural lines. In the case of fountain-basins choice plants should not be allowed to occupy positions where sprays of water would be continually falling upon them when the fountain is playing.

In a naturally-formed piece of water where a deposit of several inches of mud has accumulated, very little difficulty will be occasioned in establishing the plants if due care be taken to make their roots secure. But should the bottom be of a gravelly nature, or otherwise unsuitable to their requirements, then mounds of soil, consisting of good, rich, heavy loam of a tenacious nature, with about one-third of well-decomposed cow- or stable-manure, to which a little leaf-soil might be added, although it is not absolutely necessary, and the whole thoroughly incorporated, should be deposited for their reception. This also applies to the planting of artificial ponds, unless it be intended to grow the plants in submerged tubs or boxes—a plan, however, which, in the case of a pond of any large extent, cannot be recommended as being more satisfactory than that of planting them out on mounds.

Where it is inconvenient or undesirable to lower the depth of the water sufficiently to allow of the planting of Aquatics directly into the mud, or mounds of soil, in which they are to grow, a good method is to plant them firmly in similar soil to that recommended above, in baskets about 2½ft. in diameter and from 6in. to 9in. deep—what are known as small nursery rounds would answer the purpose. This operation should be performed as expeditiously as possible, afterwards lowering the baskets from a punt or raft into the positions the plants are to occupy, whether on the bed or on the mounds of soil, as the case may be. When the baskets become decayed, or even before, the roots will be found to have penetrated through, and have taken possession of the mud or soil below, attended with a corresponding vigorous growth of the entire plant. In the case of Nymphæas, only strong, healthy plants should be submitted to this treatment. Small plants should be nursed in shallower water, or where they would be under close observation, until sufficiently strong to be transferred to deeper quarters. In the case of small plants it is advisable to remove the flower-buds as they appear. The compost recommended to be used for planting in the above instance would be that which would also be found to meet the requirements of those grown in all circumstances where beds, tubs, or boxes are used for their reception, provided a minimum depth of 9in. of same be allowed for them to develop as much root growth as possible. This compost would also serve for the purpose of renovating the surface whenever necessary, and this operation is invariably attended with good results if done before each season's growth commences.

Where sufficient space exists for the inclusion of a representative collection of the most ornamental Aquatics, a water-garden may be made all the more attractive by a

Aquatic Plants—*continued.*

judicious disposition of the plants according to their individual characteristics, more particularly with respect to their habit of growth. For instance, there are those kinds whose leaves float on the surface of the water, amongst which are included the beautiful Water Lilies and the Sweet-scented Water Hawthorn; whereas other kinds assume a more or less tall and erect habit, as, for instance, the Flowering Rush and the Bog Bean. Then there are those the foliage of which is entirely submerged, but which produce their flower-scapes above the surface of the water, such as the pretty Water Violet, the Water Soldier (*Stratiotes aloides*), and the interesting Bladderworts, besides numerous other equally desirable and pretty subjects that thrive luxuriantly at the water's edge, where their roots can revel in an abundance of moisture.

The most suitable time for planting hardy Aquatics is about the beginning of April, or as soon as they commence active growth. Of course it may be desirable afterwards to introduce a few new acquisitions, to fill up spaces where plants may have failed, or to introduce a few tender kinds during the summer months which require the protection of a greenhouse during the winter; but for general planting, the time stated above is invariably the most advantageous. In ponds, the groups—more especially those with floating leaves—should be separated from each other by clear open spaces of water, so that when in full growth their beauty will be better displayed, and the surface will not present the appearance of being too much covered with foliage, which would have a decidedly monotonous effect.

So much for the hardy section. Now for the tropical and tender plants. Everyone who has viewed a representative collection of tropical and tender Aquatic Plants must have admired the great diversity of their appearance and, in many instances, the contrasts they present to the more familiar ones of temperate or northerly latitudes. Forming, as they do, a class of plants requiring conditions resembling, as nearly as possible, those in which they are found thriving in their native habitats, their cultivation in this country has necessarily been limited to some of the principal establishments where these conditions have been afforded, and they then have gained for their enterprising owners the genuine appreciation of horticulturists.

In the construction of a house for the cultivation of tropical Nymphæas and other Aquatics, the span-roofed form is the most suitable to adopt, as this admits the greatest amount of light, which is a most essential condition in their successful cultivation. The roof should not be too lofty—this is also an important point in connection with the conditions to be observed in their treatment. As no shading will be required it is all the more necessary that the house should be glazed with good clear glass, as oftentimes, through the presence of air-bubbles in the glass, which focus the sun's rays, heat is conducted which scorches holes in the leaves, and thereby disfigures the plants. Ventilation should be amply provided, both in the sides of the house and in the roof, for Aquatics generally, and Nymphæas in particular, when in full growth, require abundance of air on hot, sunny days. Around the inside of the house, abutting on the walls, benches or borders may be formed for the accommodation of ornamental plants, or small tanks or beds may be constructed for the culture of Aquatics, or moisture-loving plants. For heating the house, sufficient pipes should be introduced to ensure a minimum temperature of from 65deg. to 70deg. Fahr., and this would afford means for maintaining a higher temperature when desired, and would minimise the amount of piping necessary to be employed for heating the tank.

A tank for the reception of the Aquatics should be constructed in the centre of the house, and whatever the desired shape may be, and whether entirely sunk in the ground, or partly above the ground-level, a firm foundation must be first secured. The bottom should be made perfectly

Aquatic Plants—*continued.*

solid with a layer of bricks well bedded in cement and sand, and on the top of this course a good thickness of stone or brick rubble concrete should be added. The walls may be built with either brick, concrete, or stone, the thickness of which will largely depend upon the size of the tank. If it be desired to have a tank from 20ft. to 30ft. in diameter and about 2ft. 6in. in depth, walls 12in. thick to within 10in. of the top, and from that point sloping outwardly, with the masonry set in cement, would be sufficiently strong. The tank should afterwards be faced both inside and out with about 1in. coating of good cement, and the surface smoothly finished off to make it watertight. On the inside, formed against the walls, a few beds, enclosed in brickwork, might be introduced for the accommodation of strong, erect-growing Aquatics; these should reach to about 6in. below the top of the tank, so as to admit of their being submerged to a depth of 3in. or 4in. when the water is at its normal height.

For heating a tank of the dimensions given, two 4in. pipes (a flow and return) carried round the inside, about 6in. from the walls and the same distance from the bottom, will be quite sufficient, and these should be furnished with valves on the outside of the tank to allow of regulating the temperature of the water. An air-pipe should be fitted to the flow-pipe at its highest point, to release any air or steam that may accumulate in the pipes. The tank should be furnished with a plentiful supply of water, and a tap connected with the service-pipe, so that it can be turned on to its full capacity when the tank requires refilling, or regulated to a gentle flow when the Aquatics are in full growth, or as desired. An overflow stand-pipe is also necessary, the top of which should reach to nearly the full height of the tank. If constructed in two parts, somewhat on the telescope principle, so that the upper portion can be raised or lowered by sliding or screwing into the bottom part, means will thus be afforded for keeping the water at any desired height. A large brass perforated cap, similar to the rose of a watering-can, should be fitted to the top of the overflow-pipe to prevent floating matter from choking it, and the escape of small Aquatics. This stand-pipe should be situated conveniently close to the wall. It should be fitted into another pipe, set level with the bottom of the tank and connected with the drain provided, so that when any operations necessitate the tank being emptied the stand-pipe can be removed and the water readily drained off. If it should be considered desirable to paint any part of the tank that is above the ground-level, it will be best to defer doing so for a time, as the new cement would blister the paint and cause it to peel off.

It is not advisable to plant a new tank immediately after it is finished, but it may be filled with water, which should be allowed to stand for at least a week. The scum that will have by this time accumulated on the surface should be flushed and syringed off, and the tank then filled up with fresh water.

The next important operations are the arrangement of the tubs or large pots in the tank, and the preparation of the soil in which the Aquatics are to be planted. Of course, brick enclosed beds may be more freely introduced where plenty of room is afforded for growing very large specimens; but in a tank of limited dimensions, where it is desired to grow several plants of moderate size, tubs or large pots will be the most suitable, as these have the advantage of being readily moved. If tubs are employed—and perhaps they are preferable for an indoor tank—a very useful size will be found in those measuring about 18in. square, and the same in depth, with the angles securely dovetailed. They are best made of well-seasoned 1in. elm boards, as this wood is very durable when submerged in water.

The *Nymphæa* family is represented by so many species and varieties of decided merit that they should occupy a

Aquatic Plants—*continued.*

great portion of the tank (Figs. 71 and 72); therefore, it will be best to treat upon their culture first. From their habit of growth it is necessary that they should occupy the central part of the tank, the tubs or pots when in position being about 5ft. apart, and arranged alternately, so as to utilise all available surface space for the foliage. For Nymphæas to display their greatest beauty, in respect of both size and colour of their flowers, when under artificial treatment, they must have a good rich compost; and, unless this is afforded them, it is only courting disappointment to attempt their cultivation.

A compost should be prepared consisting of good, rich, heavy loam, containing an admixture of clay, and to this

Aquatic Plants—*continued.*

When filling the tubs and planting, the soil should be pressed firmly down and around the plants or tubers to within 3in. of the top, which should be surfaced with about 1in. of sand to prevent (as far as possible) the manure in the soil from rising and discolouring the water. If the tubs or pots are too full, the action of the water causes the soil to swell and run over the sides; allowances must, therefore, be made for this. When the water in the tank is at its normal height, a depth of from 10in. to 12in. above the crown of the plants will be found sufficient.

As tropical Nymphæas may be definitely classed in two divisions—namely, those displaying their flowers by day, and others that do so by night—the best effect will be

FIG. 71. VIEW OF LILY TANK IN THE OXFORD BOTANIC GARDEN

should be added a good proportion of well-decomposed cow- or stable-manure as well as a small quantity of leaf-soil, but the last-named is not absolutely necessary. If it is convenient to procure the loam from an old pasture, the top spit should be selected, and this should be stacked for about twelve months; it will then be in excellent condition. When preparing the compost the loam should be chopped up fairly coarse, and to every three parts of this should be added one part of cow- or horse-manure—the former for preference. This, when well incorporated, will form a compost of a tenacious nature, suited to the wants of the plants. The soil should be placed in the house for a few days previous to its being required, so that it may get moderately warmed.

secured if they are planted alternately, so as to have them equally distributed over the tank, with due regard to the arrangement of their colours. The *Lotus* and the *stellata* sections form two distinct groups of Water Lilies, the former embracing colours ranging from white to deep red, and the latter from pale to deep blue. As soon as the boxes are planted, the tank should be filled with water. By turning the heat fully on in the hot-water pipes, the water will be warmed as it gradually rises. This will not in any way interfere with the planting at the sides, as the plants situated there, excepting the floating ones, will be in beds or in pots resting on shelves or brick columns, provided for those which require only a shallow depth of water above the surface of the soil. Tall and vigorous-growing

Aquatic Plants—*continued.*

Aquatics, such as *Cyperus Papyrus*, *Thalia dealbata*, and *Sagittaria montevidensis*, should be planted in beds, to form good bold clumps, and any old or superfluous growth cut away before planting; this should be done firmly, leaving the crowns just above the top of the soil. The smaller-growing kinds may be accommodated in pots at the sides, with the surface of the soil just submerged.

Nelumbiums, which form such an important feature in an Aquatic-house, with their large, orbicular-peltate leaves and massive flowers—yellow, white, and various shades of rose—require very liberal treatment at the roots, and plenty of space for their long, fleshy rhizomes to develop in. When preparing a bed for their reception, the soil should consist of rich, heavy loam (as previously recommended for Nymphæas), two parts to one of good decomposed cow- or horse- manure well incorporated. The soil should be firmly pressed down, planting the rhizomes horizontally, and covering them to a depth of about 6in. Nelumbiums are very impatient of root-disturbance, therefore they should seldom be interfered with, even when they are well established, beyond giving them an annual surfacing of good rich soil. They may be successfully grown in tubs or large pots, but the best results are obtained when space admits of their being treated in the manner described above.

Floating Aquatics, or those kinds that do not necessarily require soil in which to grow, form especial objects of beauty when established in small colonies at the sides of the tank, and these include the Water Lettuce (*Pistia Stratiotes*), a pretty rosette-like plant with pale green leaves; *Limnobium bogotense*, which has little, round, deep green, shining leaves; and the elegant little fern-like annual, *Salvinia natans*, which reproduces itself from spores.

The most suitable time for planting Nymphæas in an indoor tank is from the middle to the end of February, and this also applies to the majority of tender Aquatics. Of course, the occasional introduction of additional plants will occur during the growing season—it may be of annuals or plants which are best treated as such—and these may be included at any time, as they will in no way interfere with the general planting and arrangement of the tank for the year. When this has all been done, the temperature of the water in the tank should be kept at about 70deg. Fahr., with a gradual rise as the summer advances: it should then not be allowed to exceed 80deg., but this should be maintained as uniformly as possible during the summer months.

FIG. 72. WATER LILY HOUSE AT KEW.

The house should be freely ventilated on bright sunny days, and the paths and sides occasionally damped down to prevent the atmosphere from becoming too dry, closing the ventilators in the afternoon while the sun is still on the house, and at the same time giving the plants a good syringing and the paths and sides a thorough damping down. Should green or black Aphis affect them, fumigation, which is very effectual, should be resorted to; but before this is done the surface of the foliage should be quite dry, or it will become disfigured. As the season draws to a close, the temperature of the water in the tank should be gradually diminished to about 60deg. Fahr., and this should be maintained throughout the winter months.

When the season for replanting comes round, before operations are commenced it will be advisable to run all the water out of the tank, as this will greatly facilitate

Aquatic Plants—*continued.*

the planting, and no fear need be apprehended that the plants to be re-introduced will come to any harm providing care is taken in removing them, as practically they will be at rest and without much foliage. It will also be obvious that the more expeditiously the work can be accomplished, consistently with proper care, the more satisfactory will be the results. With few exceptions the Nymphæas will then be quite devoid of foliage, and especial care should be taken when emptying the tubs of soil so as not to overlook any of the tubers. Some sorts increase very slowly, but the *Lotus* section are quite the reverse, being vigorous growers, and proportionately productive of tubers. Should any of these by chance get into a tub of another sort of weaker habit they will soon establish themselves and take entire possession. The tubers, when removed from the tubs, should be placed in pots of damp moss, and each sort labelled to prevent any confusion arising when replanting is in progress. Tubs or large pans filled with water should be conveniently to hand for the accommodation of the floating plants, and wet moss will be found very useful for covering the roots of others when removed from the tank.

The tubers of Water Lilies during their resting period are best left in the tubs in which they have been growing; but if it is necessary to remove them they can be safely kept in wet soil or sand in a warm house; and those sorts that do not die down entirely should be placed in pots of soil, submerged in pans of water, and placed in a similar position.

Aquatics may be raised from seeds at any time during the growing season, but the best results are obtained if the sowing is done early in the spring, excepting in the case of the Royal Water Lily (*Victoria regia*) and *Euryale ferox*. Seedling tropical Aquatics may be raised in an ordinary plant-stove if the temperature of the water can be maintained at about 75deg. Fahr. A simple and easy method to adopt is to sow the seeds in small pots or pans, about two-thirds filled with fine loamy soil, which should be firmly pressed down, and the seeds lightly covered. They should then receive a thorough soaking of water, and be allowed to stand for a short time before being submerged in jars or vessels of water, allowing about 2in. depth of water to cover the tops of the pots. Of course, tanks or cisterns, in which the water is of a suitable temperature, may be used; but if the water is constantly disturbed by some of it being taken out, it will have an injurious effect on seedling plants, and there will be the risk of seeds being washed out of the pots. Care should also be taken not to entirely fill the pots with soil, or the action of the water will cause it to swell and float over the sides, as stated above, which would probably result in the loss of the seeds. The seeds of many of the Nymphæas germinate quickly, and if sown early in the spring and the seedlings are pricked off as soon as they are large enough to handle, afterwards transferred singly into pots filled with good, rich soil, and the depth of water above their crowns increased as the plants develop, they should form flowering plants before the season is over. This remark particularly applies to the *stellata* group, the seeds of which germinate in about a fortnight, and, as the roots of the majority of them increase very slowly, this is the quickest and best method of propagation. The seeds of the *Lotus* section require about double the time to germinate, and, unless it is with a view to raising new sorts, they are scarcely worth the trouble, as they all, as previously stated, increase rapidly by means of tubers. Nelumbiums are easily raised from seeds, the germination of which can be greatly facilitated by carefully rubbing one side of the hard outer covering of the seeds with a file till thin, after which process they will germinate in a few days: otherwise they will require several weeks. Nelumbiums will also germinate in water placed in a warm house, but this is not a better method than the preceding. The seeds retain their vitality for a great length of time, owing to the extreme hardness of the outer covering.

Aquatic Plants—*continued.*

If it is desired to grow a plant of the Royal Water Lily, *Victoria regia* (Fig. 73), with other Aquatics in a tank, as previously described, this will necessarily require the central part of the tank. In this case a pit should be formed in the centre about 18in. in depth and large enough to contain from three to four cart-loads of soil; otherwise there would not be a sufficient depth of water above the crown of the plant. Where a tank is constructed especially for the cultivation of this Giant Lily of the Amazon—and it well merits such accommodation—it may be treated as an annual, and will then only occupy the tank from the spring till the autumn. The place may then be cleared out and utilised for the reception of large specimen plants, either arranged in the tank or on a temporarily-constructed staging of planks, supported at the sides and in the centre by trestles or brick columns. It will also serve to accommodate tender plants removed from their summer quarters out of doors, and thus be rendered attractive throughout the winter months.

To cultivate the Victoria satisfactorily it requires very liberal treatment at the roots, a large tank in which to grow, and the temperature of the water to be kept at from 80deg. to 85deg. during the summer months. The seeds, which usually take from eighteen to twenty days to germinate, should be sown about the end of January in a pan of soil, and submerged in water of the temperature already given. As soon as the seedlings are large enough to handle, they should be transferred singly into small pots, and when necessary shifted into larger ones containing good, rich soil. The pots should be so submerged that the crowns of the plants are only a few inches below the surface of the water, increasing the depth as the plants get stronger.

The number of plants available for growing either in the water or at the sides of it is very great. All, therefore, that is possible is to refer to what may be termed a select few in each section—Hardy and Tender.

First, as to those of the Hardy section, with floating and submerged leaves, of which the beautiful white Water Lilies of our rivers are such familar examples. Here we have *Alisma Plantago*, *Aponogeton distachyon*, *Hottonia palustris*, *Hydrocharis Morsus-ranæ*, *Hydrocleys Commersoni*, *Limnanthemum peltatum*, *Nuphar advena*, *N. lutea*, *N. pumila*, *Nymphæa alba*, *N. a. candidissima*, *N. odorata*, *N. pygmæa*, and *N. tuberosa*.

Then besides the species and varieties of Nymphæas are a host of hybrids, for which we are largely indebted to M. Robert Latour Marliac, and of which the following are the best:

ANDREANA, flowers brick-red, shaded with yellow, cup-shaped, and borne on long stems bearing the flowers 6in. above the water, stamens deep orange; leaves spotted with red-brown on the back and chestnut on the stalks. AURORA, flowers opening clear yellow, changing in a few days to brilliant red; leaves deep brown, streaked with a brighter shade at the back; a beautiful variety. CAROLINIANA NIVEA, flowers waxy white, of excellent form and great size, stamens deep yellow; exquisitely perfumed. CAROLINIANA PERFECTA, flowers salmon-red, very double, petals obtuse and regular, stamens deep clear yellow. ELLISIANA, flowers bright clear red, stamens a deep orange red; a charming variety. FULVA, flowers bright red, shaded with purplish-red, which becomes intensified with the age of the flower; petals incurved, stamens orange-red. GLORIOSA, flowers bright red, shaded with pale rose at the points of the petals, stamens rich red, very large and double, usually 7in. across, and sweetly scented; a superb variety. LAYDEKERI FULGENS, flowers rich amaranth, stamens deep red; a splendid variety that will become popular. LAYDEKERI LILACEA, flowers soft lilac, shaded with carmine at the points of the petals, stamens deep apricot; a very pretty variety, throwing its flowers well above the water. LAYDEKERI PURPURATA, flowers soft pink, deepening to crimson at the centre, stamens apricot. LAYDEKERI ROSEA, flowers soft pink, deepening in colour with age. LUCIDA, flowers bright pink, deepening towards the centre, very large and handsome, stamens rich orange; leaves large and marked with brown. MARLIACEA ALBIDA, flowers pure white, stamens soft yellow, large, 8in. across; very robust. MARLIACEA CARNEA, flowers soft pink, stamens soft yellow, sweetly scented, very large; a vigorous growing variety. MARLIACEA CHROMATELLA, flowers canary-yellow, stamens a little paler, very large; leaves

Aquatic Plants—*continued.*

marked with brown; vigorous and very handsome. MARLIACEA FLAMMEA, flowers dull red, shaded lightly with white at the points of the petals, stamens deep red; in growth and foliage similar to *M. chromatella*. MARLIACEA IGNEA, flowers dull or purplish red, stamens deep apricot. MARLIACEA ROSEA, an improved form of *M. carnea*. MARLIACEA RUBRA PUNCTATA, flowers pale red, deepening towards the points of the petals, stamens rich apricot; a lovely new hybrid. ODORATA EXQUISITA, flowers deep pink, stamens bright yellow, very sweetly scented; the flowers are of perfect form, and well thrown above the water; a really charming kind. ODORATA ROSACEA, flowers delicate pale pink, stamens clear yellow, sweetly scented; a free, vigorous growing hybrid. ODORATA SULPHUREA, flowers sulphur-yellow, stamens a deeper shade, standing 6in. above the water; leaves spotted with light brown. ODORATA SULPHUREA GRANDIFLORA, a glorified form of *O. sulphurea*. PYGMÆA HELVEOLA, flowers soft yellow, with stamens of a deeper shade, small, abundant, and very attractive; this plant succeeds very well in small vessels, or tubs sunk in the ground. ROBINSONI, flowers vermilion, shaded with deep purple, changing to yellow at the centre, stamens deep apricot; a lovely hybrid. SANGUINEA, flowers a beautiful shade of red, stamens orange-red; very attractive. SEIGNOURETI, flowers a charming blending of yellow, pink, and red, and seen to great advantage, as they are usually 6in. to 8in. above the water.

There are several introductions from other sources, chiefly from America and Sweden, one of the most distinct being *N. alba rosea* (*N. Caspary*).

Other species falling under the heading above adopted are *Orontium aquaticum*, *Stratiotes aloides*, *Trapa natans*, and *Utricularia vulgaris*. Some of those selected will be recognised as familiar British plants, but none the less desirable on that account.

Of the erect-growing hardy Aquatics and Sub-Aquatics there are, amongst others: *Acorus Calamus*, *A. C. striata*, *A. gramineus*; *Alisma Plantago*; *Butomus umbellatus*; *Calla palustris*; *Cladium germanicum*, *Iris Pseudacorus*, and *I. P. variegatus*; *Lysimachia thyrsiflora*; *Menyanthes trifoliata*; *Peltandra virginica*; *Phragmites communis*; *Pontederia cordata*; *Ranunculus Lingua*; *Richardia africana*; *Sagittaria sagittæfolia*; *Scirpus lacustris*; *Typha angustifolia*, *T. latifolia*, *T. Laxmanni*, and *T. stenophylla*.

Aquatic Plants—*continued.*

Waterside Plants should also be adequately represented, some very effective subjects being: *Acanthus mollis*, *A. m. latifolius*, and *A. spinosissimus*; *Arundo Donax* and *A. D. versicolor*; Bamboos; *Cyperus longus*; *Equisetum sylvaticum* and *E. Telmateia*; *Erianthus Ravennæ*; *Funkia Sieboldiana*, *F. ovata*, and *F. o. marginata*; *Gynerium argenteum*; *Gunnera chilensis* and *G. manicata*; *Juncus effusus spiralis*; *Miscanthus japonicus* and its varieties *foliis-striatus* and *zebrinus*; *Onoclea germanica* and *O. sensibilis*; *Osmunda regalis* and *O. r. cristata*; *Panicum virgatum*; *Phalaris arundinacea variegata*; *Podophyllum Emodi* and *P. peltatum*; *Polygonum sachalinense* and *P. s. cuspidatum*; *Rheum Emodi* and *R. palmatum*; *Rodgersia podophylla*; *Scirpus Holoschænus variegatus* and *S. Tabernæmontani zebrinus*; *Scolopendrium vulgare*; and *Uniola latifolia*.

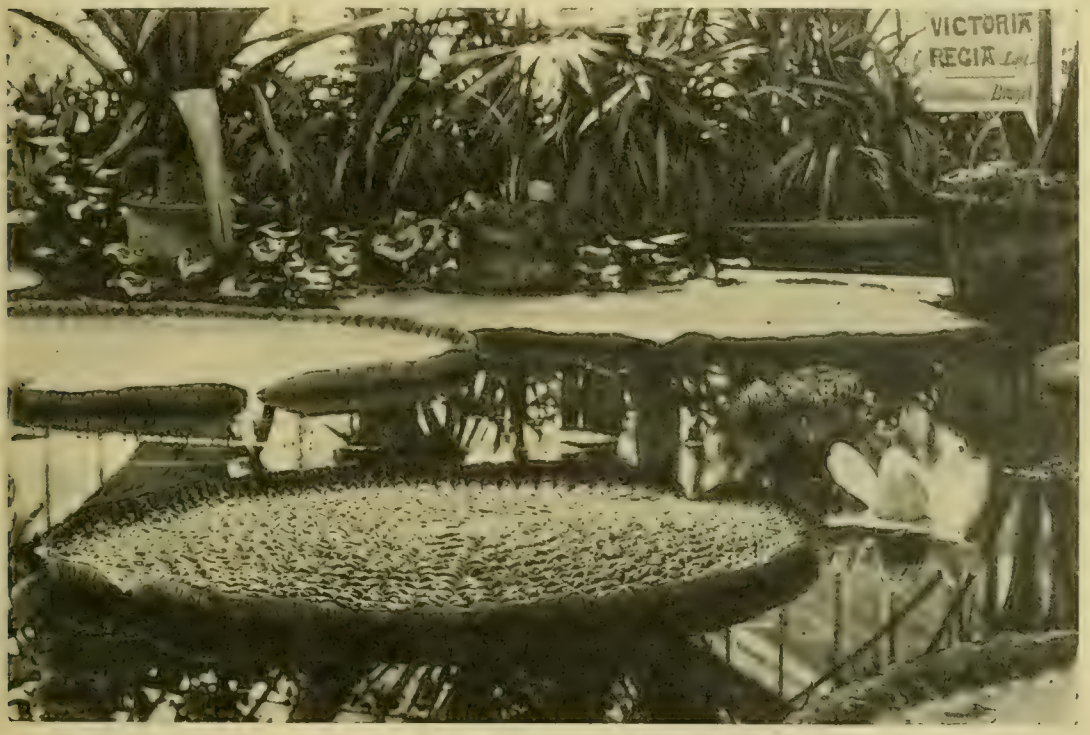


FIG. 73. VICTORIA REGIA AT KEW.

Flowering Waterside Plants offer an even wider choice for the enthusiast in Aquatics, and those mentioned hereunder may be recommended: *Asclepias incarnata*, *Astilbe rivularis*; *Bocconia cordata*; *Caltha palustris* and *C. p. monstrosa*; *Cardamine pinnata* and *C. pentaphylla*; *Epilobium angustifolium*, *E. a. album*, and *E. hirsutum*; *Hemerocallis flava* and *H. fulva*; *Iris lævigata*, *I. Monnieri*, and *I. sibirica*; *Kniphofias*; *Lilium pardalinum*, *L. superbum*, and *L. s. carolinianum*; *Lysimachia clethroides* and *L. c. vulgaris*; *Lythrium Salicaria* and the varieties *roseum* and *superbum*; *Myosotis palustris*; *Parnassia palustris*; *Polygonatum multiflorum*; *Primula japonica* and *P. sikkimensis*; *Saxifraga peltata* and *S. purpurascens*; *Spiræa Aruncus*, *S. astilboides*, *S. camtschatica*, *S. lobata*, *S. palmata*, and *S. Ulmaria*; *Trillium grandiflorum*; *Trollius asiaticus* and *T. europæus*; and Yuccas.

Aquatic Plants—*continued.*

Tropical and tender kinds embrace the following amongst others: *Aponogeton fenestrale; Cabomba aquatica; Ceratopteris thalictroides; Cyperus alternifolius, C. a. variegatus, C. natalensis,* and *C. Papyrus; Eichhornia azurea, E. Martiana,* and *E. speciosa; Herpestis Monniera; Hydrolea spinosa; Jussieua grandiflora; Limnanthemum indicum; Limnobium bogotense; Limnocharis emarginata; Myriophyllum proserpinacoides; Nelumbium luteum* and *N. speciosum; Neptunia plena; Nymphæa amazonum, N. Boucheana, N. capensis, N. Daubenyana, N. Deaniana, N. devoniensis, N. elegans, N. Eugenie, N. flava, N. gigantea, N. gracilis, N. kewensis, N. Lotus, N. L. dentata, N. L. monstrosa, N. L. rubra, N. L. thermalis, N. mexicana, N. micrantha, N. O'Marana, N. Ortgiesiana, N. pulcherrima, N. stellata, N. s. cyanea, N. s. versicolor, N. Sturtevantii, N. zanzibarensis,* and *N. z. azurea; Ottelia ovalifolia; Philydrum lanuginosum; Pistia stratiotes; Sagittaria lancifolia, S. l. angustifolia,* and *S. montevidensis; Salvinia natans;* and *Thalia dealbata.* The last-named (*Thalia dealbata*) has been grown in ornamental water at Kew in the open air for many years; it is nearly hardy.

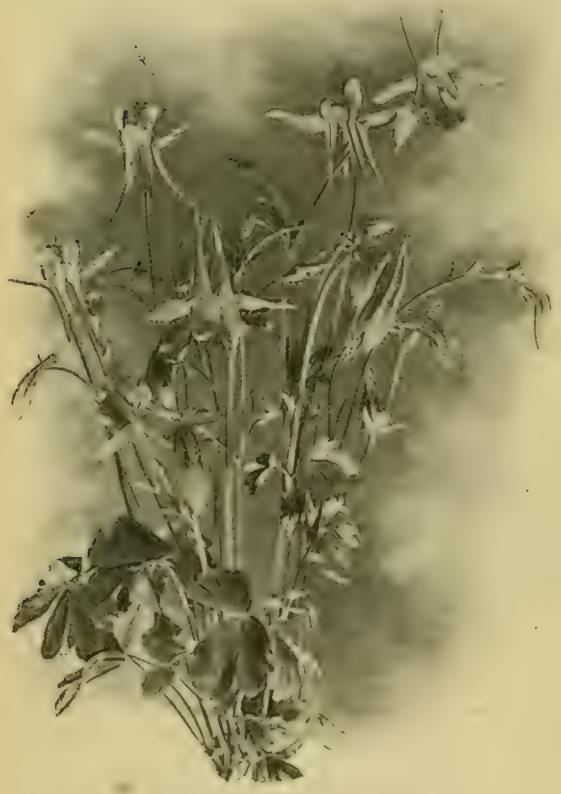


FIG. 74. AQUILEGIA CHRYSANTHA.

AQUILARIA (from *aquila*, an eagle; the native name in Morocco is Eagle Wood). SYNS. *Agallochum, Ophispermum.* ORD. *Thymelæaceæ.* A small genus (two or three species) of stove trees, natives of Eastern Asia and the Malayan Archipelago. Flowers pedicellate; umbellules sub-sessile, axillary or terminal. Leaves alternate. *A. malaccensis,* the only species introduced, is probably not now cultivated.

AQUILARIEÆ. A tribe of **Thymelæaceæ** (which *see*).

AQUILEGIA. According to Bentham and Hooker, the numerous species may be reduced to about five or six; they are mostly distributed over the North temperate zone, the genus being represented in Britain by *A. vulgaris.*

These useful plants have been very much employed of late years, and considerable improvements have been made by the florist. The beautiful hybrid forms, both long-spurred and short-spurred, are extremely decorative, and some of the best should always be included. Columbines are not as often used on the rockery as they might be, considering their utility. Usually these plants are regarded as pure sun-lovers, but as a matter of fact shade is good for them, and especially for those early kinds which push their buds while frosts are to be reckoned with. To grow, for instance, the lovely hybrid *A. Stuarti* in a south border, or in any position where the sun strikes very early in the morning, is to sacrifice much of its beauty. A north-west border is the best place for this, as in the event of spring frosts the thawing process would be gradual; whereas if strong sun immediately followed a severe frost the buds would be for a certainty damaged. And similarly with other early-flowering kinds. Those who study effect in their gardens will find it best to raise a fresh stock of Columbines each year, instead of, as is frequently done, retaining the old plants. For the rock garden *A. alpina, A. cærulea, A. pyrenaica,* and *A. glandulosa* are the best kinds; they may also be utilised for border decoration, so long as the soil is rich, moist, deep, and free, along with *A. canadensis, A. formosa, A. chrysantha* (Fig. 74), *A. Skinneri, A. Stuarti, A. vulgaris* and its white form *alba*, and the beautiful Munstead White, a tall-growing (2ft.) large-flowered variety.

To the species and varieties described on pp. 100-2, Vol. I., the following should be added:

A. atrata (dark). A variety of *A. vulgaris.*

A. cærulea flore-pleno (double-flowered). An apparently double-flowered variety; a number of the stamens are transformed into white, petaloid processes, tubular at the base. 1880.

A. cæruleo-chrysantha (hybrid). A garden hybrid between the two species indicated in the name. 1889.

A. chrysantha nana (dwarf).* *fl.* golden-yellow. *h.* 1½ft. 1890. A pretty variety.

A. flabellata (fan-shaped). *fl.* white, slightly tinted with violet-rose. A very early-flowering, compact-habited, dwarf, garden form. (R. H. 1887, p. 548.) The variety *flore-alb o* has flowers entirely white.

A. f. nana flore-albo (dwarf, white-flowered). A garden variety. 1888.

A. hybrida (hybrid). A form of *A. cærulea.*

A. kanaoriensis (Kanaor). A synonym of *A. Moorcroftiana.*

A. longissima (very long). *fl.* pale yellow, straw-coloured, nearly white, or tinged with red; spurs 4in. or more in length. *l.* glaucous beneath. Texas and Mexico, 1888. A handsome Columbine, of tall habit, slightly pubescent with silky hairs; it is allied to *A. chrysantha.* (G. & F. 1888, i., p.31, f. 6.)

A. Moorcroftiana (Moorcroft's). *fl.* purplish-blue, drooping, the petals white at the tips, resembling *A. vulgaris,* but all the spurs are straight. May and June. *l.*, radical ones on long stalks, bi-triternate; leaflets petiolulate, cuneate, three-lobed; cauline leaves remote, on shorter and less divided petioles. *h.* 1ft. Kanaor, Himalayas. SYN. *A. kanaoriensis* (B. M. 4693).

FIG. 75. FLOWERS AND LEAVES OF AQUILEGIA STUARTI.

Aquilegia—*continued.*

A. olympica flore-pleno (double-flowered). *fl.* blue, with a white centre, very large. 1888.

A. oxypetala (sharp-petaled). A synonym of *A. oxysepala.*

A. oxysepala (sharp-sepaled). This is closely allied to *A. vulgaris*, but has very narrow and very acute sepals and larger leaves. Siberia, 1890. SYN. *A. oxypetala.*

A. sibirica flore-pleno (double-flowered). *fl.* blue, large, very double; petals bordered with white, sometimes turning yellowish. There are other colour varieties.

A. Skinneri (Skinner's).* *fl.* drooping; petals with the limb yellowish-green and rounded, prolonged at base into a very long, tubular, lively red spur. Summer and autumn. *l.* mostly radical, glaucous, on long petioles, biternate; leaflets petiolulate and cordate, deeply three-lobed. Stem 2ft. to 3ft. high, panicled above. Guatemala. (B. M. 3919.) The variety *flore-pleno* (R. G. 1885, p. 57) has double flowers.

A. Stuarti (Stuart's).* *fl.* 3in. or more across, erect; sepals dark bluish-purple, 1¼in. long, large, regular; petals pure white, shading to bright blue at the base. 1894. A garden hybrid between *A. glandulosa* and *A. vulgaris Wittmanniana.* See Fig. 75.

A. transilvanica (Transylvanian). A synonym of *A. glandulosa.*

A. vulgaris atrata (dark). A form with dark violet flowers. 1890.

A. v. flore-pleno (double-flowered). *fl.* variously coloured and very double. The form *variegata* has lilac sepals and the limb of the petals white.

AQUILICIA. A synonym of **Leea** (which *see*).

ARABIS. Including *Stevenia* and *Turritis.* Upwards of 130 species have been referred to this genus, of which probably not more than sixty are entitled to rank as such; they are broadly dispersed, but most plentiful in Europe and North America. Six species are included in the British Flora, viz., *A. ciliata, A. hirsuta, A. perfoliata* (Tower Mustard), *A. petræa* (Northern Rock Cress), *A. stricta* (Bristol Rock Cress), and *A. Turrita* (Tower Cress, Tower Rockcress).

In very dry places the various kinds of Arabis are amongst the best of spring flowers. Used, too, in conjunction with the Alyssums they are very effective, especially as edging plants, where the variegated forms of *A. albida* and *A. procurrens* come in useful. These plants are not very compact of growth, and some little care is required to keep them neat-looking. This is best done by pegging down the stems. When employed for the decoration of the borders it is not unusual to plant them upon a mound.

To the plants described on p. 102, Vol. I., the following should be added:

A. alpina flore-pleno (double-flowered). An interesting garden variety with very double, white flowers. 1898.

A. muralis (wall-loving). *fl.* white; petals oblong; pedicels twice as long as the calyx; racemes erect, terminal. May. *l.* pubescent, toothed; radical ones spathulate, obtuse; cauline ones ovate, acute. Branches hairy. *h.* 4in. to 6in. Etruria, &c.

A. nudicaulis (naked-stemmed). A synonym of *Parrya nudicaulis.*

A. Stelleri (Steller's). *fl.* white; petals cuneate-oblong, twice as long as the calyx; raceme corymbose. June. *l.*, lower ones oblong-spathulate; upper ones half-amplexicaul, oblong, toothed. Kamtschatka. A capital little plant for the rock-garden.

A. Sturii (Stur's). An especially vigorous and compact garden variety, with large, pure white flowers. 1897.

ARACHNANTHE (from *arachne*, a spider, and *anthe*, a flower; in allusion to the shape of the flower). SYN. *Arachnis.* Including *Esmeralda.* ORD. *Orchideæ.* A genus comprising about half-a-dozen species of stove, epiphytal Orchids; one is Himalayan, and the rest inhabit the Malayan Archipelago. Flowers showy; sepals and petals free, spreading, rather thick; lip articulated at the base of the column, erect or spreading, neither saccate nor spurred at base, the lateral lobes erect or rarely obsolete, the middle one fleshy, polymorphous, often gibbous or with a very short spur at back; column short, thick; pollen masses two; peduncles lateral, elongated, simple or branched. Leaves distichous, fleshy-coriaceous,

Arachnanthe—*continued.*

sometimes very long, sometimes shorter or falcate, often obliquely bilobed at apex. Four species call for description here. For culture, *see* **Aërides.**

A. bella (pretty). *fl.*, sepals and petals light ochre, barred cinnamon, straight, cuneate-oblong; lip white, the lateral segments striped purplish-brown, the middle one very broad, tumid, the basilar, roundish callus white, spotted brown; raceme four-flowered. *l.* 5in. long, 1in. broad, shining, unequally bilobed at apex. 1888. SYN. *Esmeralda bella.*

A. Cathcarti (Cathcart's). The correct name of the plant described on p. 133, Vol. IV., as *Vanda Cathcarti.*

A. Clarkei (Clarke's). *fl.* much as in *A. Cathcarti;* sepals and petals dark brown, barred ochre, yellow inside, cuneate-oblong, obtuse; lip whitish, marked brown, three-lobed, with a conical, acute spur, the front lobe cordate, oblong-elliptic, with a rough, lobulate border, and seven to nine whitish keels; the mouth of the spur covered by two retrorse crests, with another crest in front. Himalayas, 1886. (B. M. 7077.) SYN. *Vanda Clarkei.*

A. Lowii (Low's). The correct name of the plant described on p. 283, Vol. III., as *Renanthera Lowii.* (R. 1889, 71.)

A. L. Rohdeniana (Rohden's). *fl.* brighter-coloured than in the type, the four lower yellow ones being separated from the rest by an interval of 9in. to 12in. *l.* narrower and shorter. Borneo, 1891.

A. moschifera (musk-bearing). *fl.* creamy-white or lemon-colour, spotted purple, large, resembling a spider, delicately scented like musk. Java. A peculiar and rare plant. The old spike produces flowers for a long time, and should, therefore, not be cut. SYNS. *Epidendrum Flos-aëris, Renanthera Arachnites, R. Flos-aëris.*

ARACHNIS. A synonym of **Arachnanthe** (which *see*).

ARACHNITES. In part synonymous with **Ophrys** (which *see*).

ARALIA. Bentham and Hooker include *Dimorphanthus* here. Of the thirty species comprised in this genus, six are North American, one is Mexican, and the rest inhabit Eastern or tropical Asia, from Japan and Mandschuria as far as the Himalayas and the Indian Archipelago. *See also* **Dizygotheca.**

Many of the Aralias are amongst the most decorative of plants used to furnish the outside garden. A species, however, which is not as often seen as it might be is *A. cachemirica.* This may be most effectively grown in large beds, in the shrubbery border, or as a lawn plant, where its noble appearance and beautiful foliage stand it in excellent stead. *Aralia spinosa* is another species of equal value for such purposes as suggested in connection with the lesser known *A. cachemirica.*

To the species and varieties described on pp. 104-5, Vol. I., the following should be added:

A. Balfouriana (Balfour's). *l.* abundantly produced; leaflets three on each side, sub-orbicular, emarginate at base, the medial one very large, all irregularly toothed and spotted with white on the borders. New Caledonia. A branched, tufted tree. (R. H. 1898, p. 229.)

A. cachemirica (Cashmere).* *fl.* white; umbels in elongated panicles sometimes 1ft. long, but many smaller; bracts sometimes leaf-like and 1½in. long. *l.* pinnate to tripinnate, the ultimate pinna with five to nine leaflets; leaflets 3½in. by 1½in., elliptic, shortly acuminate, often cordate at base. *h.* 5ft. to 10ft. Cashmere, 1888. A stately, hardy herb. SYN. *A. macrophylla.*

A. Chabrieri (Chabrier's), of gardens. A synonym of *Elæodendron orientale.*

A. chinensis elata (tall). The correct name of *Dimorphanthus mandschuricus.*

A. c. foliis aureo-variegatis (having golden, variegated leaves). A form, described by its name, introduced in 1896.

A. Gemma (jewel). *l.* graceful, bipinnate; pinnules with small lateral leaflets and a large terminal one, all irregularly lobed or toothed, olive-green above, greyish-violet beneath when young. New Caledonia, 1883. An ornamental stove shrub. (I. H. 1883, 477.)

A. leptophylla is now known as *Dizygotheca leptophylla.*

A. macrophylla (large-leaved). A synonym of *A. cachemirica.*

A. mandschurica (Manchurian). A synonym of *A. chinensis elata.*

Aralia—*continued.*

A. reginæ (queenly). This is of larger habit than the *Veitchii* section; the leaf branches are more closely set, and the habit of growth is very graceful; the stem and petioles are freckled; the palmate divisions of the stalk are smooth, and of a uniform green. Stove.

A. Sieboldii (Siebold's). The plant commonly grown in gardens under this name is *Fatsia japonica.*

A. triloba (three-lobed). *l.* three-lobed, each segment being nearly 1ft. long and about ¾in. across, of a deep, bright green. New Caledonia, 1896. A fine and distinct stove plant.

ARAUCARIA. SYN. *Dombeya* (of La Marck). Including *Altingia* and *Eutacta.* The known species of this genus number about ten, and inhabit South America, Australia, New Caledonia, and the South Pacific Islands. To those described on p. 106, Vol. I., the following should be added:

A. brasiliana (Brazilian). The correct name of *A. brasiliensis.*

A. elegans (elegant). A synonym of *A. brasiliana.*

A. imbricata platifolia (broad-leaved). A form with much broader leaves than in the type. 1895.

A. Muelleri (Mueller's). *l.* oval, imbricated, almost flat, longitudinally marked with small, whitish spots arranged in series. *cones* ovoid, 5½in. long, 3½in. broad; scales about 1⅞in. long and broad. New Caledonia, 1884. Plant ultimately forming a large tree, with spreading, plume-like branches. (F. & P. 1884, p. 27; I. H. ser. iv. 449.)

ARAUJIA. The correct name of the genus described on pp. 115-6, Vol. III., as *Physianthus.*

A. grandiflora (large-flowered).* *fl.* pure white, very sweet-scented, funnel-shaped, nearly 3in. across, borne in clusters of about six. September. *l.* cordate-obovate, acute. Brazil, 1837. SYN. *Schubertia grandiflora* (Gn., 30th July, 1887).

ARBORICULTURE is that phase of gardening which treats of the culture of trees. An Arboriculturist is one who cultivates trees, making them a speciality.

ARBOUR. An Arbour is always a favourite place in a garden, and may be formed under trees that naturally lend themselves to the purpose. The Weeping Ash is excellent; in fact, most of the Weeping trees are suitable. The Yew, again, Beech, and the Portugal Laurel may all be trained to form very pleasant retreats. The Arbour which finds the most favour is one made with wood or iron trellis, and covered with Roses, Clematis, Honeysuckle, Jasmine, or other sweet-scented climbers. Occasionally an Arbour is covered with Ivy or Ampelopsis, and very handsome they are on the exterior, though they make the inside somewhat dark.

ARBUSCLE. A low shrub in the form of a tree.

ARBUTUS. About ten species are referred to this genus; they are natives of Europe and North America, the genus being represented in this country by *A. Unedo.* For several species formerly included here, *see* **Arctostaphylos** and **Pernettya.**

It is very important that the soil in which the species of *Arbutus* are planted should be thoroughly well drained, as they abhor anything like stagnation at the roots. Although hardy, it is not advisable to plant them in positions exposed to cold winds or under or near large trees, as they refuse to flower freely unless the growths are properly ripened.

Propagation. Budding may be conducted with success during the month of July, taking care to use eyes only from well-matured wood. Grafting should be performed in spring, just before growth commences. After the scions have been securely tied to the stocks they should be placed in a close case, where the temperature ranges from 60deg. to 70deg. They must be shaded from the sun, and a slight syringing overhead occasionally will be of great assistance in helping them to start away more freely. When growth an inch or so in length has been made, it will be advisable to stand them in a more airy part of the house. They should be grown in pots until the following spring, and then planted out in nursery rows in a mixture of peat, loam, and leaf-mould.

Arbutus—*continued.*

A. furiens (raging). *fl.* in short axillary racemes. *fr.* a reddish-brown berry, causing delirium if eaten. *l.* oval, shortly petiolate, denticulate, shining above. Chili.

A. Milleri (Miller's). A garden hybrid, with pink flowers and large leaves.

A. phillyreæfolia (Phillyrea-leaved). A synonym of *Pernettya phillyreæfolia.*

ARCADE. An Arcade in a garden is usually a walk covered over in the form of a trellis with trees or climbers. A very fine Arcade made with trees may be seen at Hampton Court Palace, and in many gardens beautiful Arcades are made with iron and stout wire, covered with Roses or other suitable plants in the summer months. A profitable and highly ornamental Arcade could be made by planting Apple, Pear, and Plum Trees in cordon form, and training them over the trellis until they meet in the centre. By planting varieties that are known to fruit freely on cordon trees, and also by selecting sorts that produce large or handsome fruit, a fine effect is produced, alike when the trees are in blossom and in fruit; in addition to which the fruit is valuable for use.

FIG. 76. ARCHONTOPHŒNIX CUNNINGHAMII.

ARCHANGEL, YELLOW. A common name for **Lamium Galeobdolon** (which *see*).

ARCHANGELICA (from *arche*, chief, and *Angelica*, an allied genus). ORD. *Umbelliferæ.* A small genus (five species) of hardy, often tall herbs, natives of Europe,

Archangelica—*continued.*

Northern Asia, and America. Flowers white or greenish, in compound, many-rayed umbels; involucral bracts small or wanting. Leaves pinnately decompound. Only one species calls for description here. For culture, &c., *see* **Angelica.**

A. officinalis (officinal). Common Angelica. *fl.* greenish; involucel as long as the umbellets. July. *l.* bipinnately divided; segments sub-cordate, lobed, acutely serrated, the terminal one three-lobed. Europe (but not indigenous in Britain). SYN. *Angelica Archangelica.*

ARCHONTOPHŒNIX (from *archonte*, chief, and *Phœnix*; in allusion to their majestic aspect and their relationship). ORD. *Palmæ.* A small genus (two species) of tall, stove, unarmed Palms, natives of Eastern Australia. Flowers rather large, monœcious in the same spadix, spirally disposed; spadices shortly pedunculate, the branches and branchlets pendulous; spathes two, complete, caducous; inflorescence under the leaves. Leaves terminal, equally pinnatisect; segments linear-lanceolate, acuminate or bidentate at apex. Caudex marked with annular scars. The two species, *A. Alexandræ* and *A. Cunninghamii* (see Fig. 76), were formerly included under **Ptychosperma** (where they will be found described).

ARCTIA. ORD. *Lepidoptera.* A genus of gaily-coloured Moths, two species of which are found in gardens. The larvæ are destructive to Lettuce, Forget-me-Nots, and other plants. Being hairy, the larvæ are seldom taken by insectivorous birds. The Cuckoo, however, will devour them greedily. *See* **Tiger Moth.**

ARCTIO and **ARCTIUM** (of La Marck). Synonyms of **Berardia** (which *see*).

ARCTOCALYX. Included under **Solenophora** (which *see*).

ARCTOSTAPHYLOS. Bentham and Hooker include *Comarostaphylis* here, but it has been kept distinct on p. 364, Vol. I. The genus includes fifteen species, of which two inhabit the colder regions of the Northern Hemisphere, and the rest are Mexican and Californian. To the species described on p. 108, Vol. I., the following should be added:

A. nevadensis (Nevada). *fl.* reddish, ¼in. long, in simple, small clusters. Spring. *fr.* reddish, sub-acid. *l.* obovate or oval, varying to lanceolate-spathulate, cuspidate-mucronate, thicker than in *A. Uva-ursi*, abruptly petiolate. Sierra Nevada, California, 1896. A prostrate, evergreen bush.

ARCTOTIS. This genus comprises about thirty species: one is Abyssinian, and the remainder are South African. Leaves radical or alternate. To those described on p. 108, Vol. I., the following should be added. One or two species formerly included here are now referred to **Cryptostemma.**

A. arborescens is synonymous with *A. aspera.*

A. aspera (rough). *fl.-heads* yellow; outer involucral scales linear-subulate, hispid. August. *l.* commonly tomentose beneath, but sometimes naked, hispid and setose above, pinnatifid or inciso-pinnatifid; lobes toothed, broad or narrow; cauline ones dilated and amplexicaul. Stem half-shrubby, branching, hispid, scabrous or tomentose. *h.* 3ft. South Africa, 1710. SYN. *A. arborescens.*

A. a. undulata (waved). A synonym of *A. aurcola.*

A. aureola (golden). *fl.-heads* brilliant orange, 3in. to 4½in. across; involucral scales rounded at apex, black-bordered, the outer ones recurved; ray florets in two series, obtuse; peduncles woolly. April. *l.* sessile, oblong or ovate-oblong, sinuate-pinnatifid; lobes oblong or broadly ovate. South Africa, 1710. Plant erect or decumbent, white-woolly. (B. M. 6835, upper figure.) SYN. *A. aspera undulata.*

A. cuprea (coppery). A synonym of *A. aspera undulata.*

A. glutinosa (glutinous). A synonym of *Dimorphotheca cuneata.*

A. Leichtliniana (Leichtlin's). *fl.-heads* 2½in. in diameter; ray florets golden-yellow, with a dark basal mark, below flaked with red, 1¼in. long. Summer. *l.* 2in. to 8in. long, obovate or oblanceolate, petiolate, pinnatifid and toothed; lobes oblong, slightly lobulate. 1885.

A. revoluta (revolute). *fl.-heads* orange-yellow, not so brilliant as those of *A. grandiflora*, 2½in. across; outer involucral scales much narrower than in *A. grandiflora*, and having tomentose tips; the others having no black border. Cape of Good Hope, 1820. (B. M. 6835, lower figure.)

ARCUATION. Another name for **Layering** (which *see*).

ARDISIA. SYNS. *Bladhia, Pyrghus.* Including *Icacorea.* Of this genus there are about 200 species, broadly dispersed through tropical and sub-tropical regions, but very rare in tropical Africa. To those described on p. 109, Vol. I., the following should be added:

A. acuminata. *Icacorea guianensis* is synonymous with this species.

A. capitata (headed). *fl.* greenish-white, disposed in a cone-like head; peduncles axillary, compressed. Summer. *fr.* bright red. *l.* crowded at the tips of the branches, 1ft. or more long, obovate-spathulate, entire, shortly stalked. Branches thick. Fiji, 1887.

A. crenata (crenate). The correct name (B. M. 1950) of *A. crenulata* (L. B. C. 2). SYN. *A. crispa.*

A. crispa is identical with *A. crenata.*

A. excelsa (tall). A synonym of *Myrsine Heberdenia.*

A. mamillata (nippled). *fl.* white, tinged rose, star-shaped; umbels ten- to twelve-flowered, on axillary peduncles 2in. long. *fr.* brilliant rosy-red, about ⅜in. in diameter. *l.* oblong-elliptic, 4in. or more long, dark, shining green, thickly studded with small, raised dots or mamillæ on the upper surface, with proportionate hollows beneath, each mamilla surmounted by a white, bristly hair; petioles short. Hong Kong, 1837. (G. C. ser. iii., vol. ii., p. 809.)

A. metallica (metallic). *l.* tinted with violet on the upper surface. Sumatra, 1831. (I. H. xxviii., t. 421.)

A. picta (painted). *l.* lanceolate, acute, crenate at the margins, dark, velvety bronze-green, with a broad, central, feathered, silvery stripe. Brazil, 1885. An ornamental foliage plant.

A. polycephala (many-headed). *fl.* white, borne in umbels, on short, lateral branches, sometimes in a dense raceme 2in. to 4in. long; peduncles axillary, short, stout, compressed. *fr.* jet-black. *l.* opposite, elliptic or oblong, narrowed at both ends, 7in. to 9in. long, 2¼in. broad, dark, glossy green, when young bright crimson. East Indies, 1888.

A. solanacea (Solanum-like). A synonym of *A. humilis.* (B. M. 1677.)

ARDUINA. Bentham and Hooker regard this as synonymous with **Carissa** (which *see*).

FIG. 77. ARECA GLANDIFORMIS.

ARECA. According to the authors of the "Genera Plantarum," this genus now embraces about two dozen species, natives of tropical Asia, the Malayan Archipelago, tropical Australia, and New Guinea. Leaves terminal, equally pinnatisect. To the species described on pp. 109-10, Vol. I., the following should be added. Species

Areca—*continued.*

formerly included in this genus have been referred to **Bacularia, Calyptrocalyx, Chrysalidocarpus, Cyrtostachys, Dictyosperma, Dypsis, Nephrosperma, Oreodoxa, Pinanga, Prestoëa, Ptychosperma, Rhopalostylis** and **Stevensonia** (in addition to other genera mentioned in Vol. I.).

A. glandiformis. Fig. 77 illustrates the decorative character of this species in a young state.

A. laxa (loose). *fl.*, spathe solitary, marginate; spadix decompound. *l.*, leaflets lanceolate, acute, entire, equidistant. Stem 20ft. to 30ft. high, somewhat tumid, usually incurved. Andaman Islands.

A. Micholitzii (Micholitz'). *l.* large, sparsely divided. Stems 9ft. high. New Guinea, 1895.

A. macrocalyx (large-calyxed). *fl.*, spadix nodding, simply branched. *fr.* congested, ellipsoid-obtuse, umbonate. *l.*, leaflets remote, lanceolate-linear, very acute; rachis slightly furfuraceous. Stem slender, 15ft. to 20ft. high. Java.

A. elegantissima and *A. Sanderi* are rare in cultivation.

A. Buchenbergi (R. H. 1898, p. 264) and *A. Ilsemanni* (R. H. 1898, p. 261), are garden names for plants grown on the Continent, but not in general cultivation in this country.

ARENARIA. Under this genus Bentham and Hooker include *Alsine, Cherleria, Gouffeia, Minuartia,* and *Mœhringia* (the last-named is kept separate in this work). Flowers white or very rarely red, terminal, cymose-paniculate or capitate, rarely axillary and almost solitary; sepals five, rarely four; petals the same, entire or slightly emarginate, rarely wanting; stamens ten, rarely eight, or fewer by abortion. Seven species are indigenous in the British Islands. To those described on p. 110, Vol. I., the following should be added;

A. Huteri (Huter's). *fl.* pure white, large for the size of the plant, terminal and axillary in the upper leaves. Stems thickly set. *h.* about 1in. Tyrol, 1894. An attractive alpine, rockery plant. (J. H., 1894, xxix., p. 369, f. 57.)

A. muscosa (mossy). The correct name of *Mœhringia muscosa.*

A. norvegica (Norwegian).* A nearly glabrous, Scottish variety of *A. ciliata*, with rather broader sepals, shorter peduncles, and more succulent leaves, seldom fringed. It forms dense cushions about 6in. across. (F. D. 1259; Sy. En. B. 237.)

A. verna flore-pleno (double-flowered). A very pretty variety, with small, very double, white flowers; it is, however, rather delicate.

ARENBERGIA. A synonym of **Eustoma** (which *see*).

ARENGA. SYNS. *Gomutus, Saguerus.* This genus includes about half-a-dozen species of tall, stout, stove Palms, natives of tropical Asia, the Malayan Archipelago, New Guinea, and tropical Australia. Flowers fuscous- or yellowish-green or purplish, large, appearing first from an upper leaf-axil, and successively from lower ones; spadices interfoliolar, large, much branched; spathes many, clothing the peduncle of the spadix. Fruit globose-obovoid. Leaves terminal, long, pinnatisect; leaflets long, linear, usually præmorse, one-ribbed, with one or two auricles at base. To the species described on p. 110, Vol. I., the following should be added:

A. Engleri (Engler's). *fl.* said to be very fragrant; spadices much branched. *fr.* sub-globose, ½in. in diameter. *l.* consisting of numerous leaflets which are 16in. long, dark green above, silvery beneath. *h.* 5ft. Formosa, 1895.

A. Griffithii (Griffith's). A synonym of *A. saccharifera.*

A. obtusifolia (obtuse-leaved). This is distinguished from *A. saccharifera* in having bifariously-arranged leaflets with deflexed tips, the upper ones alone auricled and only on one side. Penang, &c.

A. saccharifera (sugar-bearing). *fl.*, male spadix purple, 4ft. to 5ft. long, simply branched, the flowers 1in. or less in length; female flowers solitary. *l.* numerous, 20ft. to 28ft. long; leaflets quadrifariously fascicled, as many as 115 on each side, 3ft. to 5ft. long, sub-sessile, scurfy beneath, toothed towards the tip. Trunk stout, 20ft. to 40ft. high. Assam, &c., 1829. SYN. *A. Griffithii.*

A. Wightii (Wight's). *fl.*, spadices 4ft. long; peduncles 2ft. long. *fr.* the size of a crab apple. *l.* 12ft. to 28ft. long; leaflets alternate, crowded, linear-ensiform, 3ft. to 3½ft. long, 1½in. to 2in. broad, sparingly toothed from the middle upwards; lower auricle very large, overlapping the petiole. Trunk 3ft. to 8ft. high, stout, soboliferous. Deccan Peninsula, 1882.

A. Bonnetii and *A. Listeri* are rare in cultivation.

ARGEMONE. Mexican Poppy. SYN. *Echtrus.* This genus includes about half-a-dozen species, all American, one being broadly scattered over the tropical regions of the globe. To the information given on p. 110., Vol. I., the following should be added:

A. albiflora is a variety of *A. mexicana.*

A. hispida (hispid). The correct name of *A. hirsuta.* (B. M. 6402.)

A. Hunnemanni (Hunnemann's). The showy plant known in gardens by this name is properly called *Hunnemannia fumariæfolia* (which *see.*)

ARGYLIA (named in honour of Archibald Campbell, third Duke of Argyll, who introduced many American trees and shrubs into this country). SYN. *Oxymitus.* ORD. *Bignoniaceæ.* A genus embracing about ten species of perennial herbs, confined to the Andean region of Chili and Peru. Flowers yellow, purple, or pink, variously disposed; calyx five-parted, the segments narrow; corolla-tube long, enlarged above, straight or incurved, the limb spreading, with five nearly equal lobes, or the two posterior ones smaller; stamens four, affixed to the middle of the tube. Leaves radical or alternate, digitately five- to seven- (rarely three-) foliolate; leaflets incised-toothed or twice or thrice pinnatisect. Only one species calls for mention here. It requires sandy, well-drained soil, and an intermediate temperature.

A. canescens (hoary). *fl.* bright yellow, with red streaks in the throat, sub-corymbosely disposed at the summit of the stem, and a few scattered in the axils below, 1in. long, 1½in. across; stem erect, 1ft. to 1½ft. high. July. *l.* Carrot-like, alternate, distant, whorled, 2in. to 3½in. long. Caudex fleshy, several inches in height, cylindrical. Chili, 1892. (B. M. 7414.)

ARGYREIA. About two dozen species are included in this genus: one is tropical African, and the remainder are found in the East Indies and the Malayan Archipelago. Flowers violet, red, or white, showy; sepals equal, or the inner ones much narrower; corolla funnel-shaped, the limb plicate, angled, or five-lobed; stamens included; cymes often few-flowered, pedunculate in the axils, or the upper ones corymbose-paniculate. Leaves usually large, silky, tomentose, villous, or rarely glabrous beneath. To the species described on p. 111, Vol. I., the following should be added:

A. hirsuta (hairy). *fl.* lilac; peduncles often 4in. to 8in. long; bracts prominent, linear or oblong, the outer one often petiolate and leaf-like, making the cymes pseudo-sessile. June. *l.* ovate-cordate, acute, shaggy beneath. *h.* 10ft. India, 1850. (B. M. 4946.)

A. Hookeri (Hooker's). *fl.*, corolla pink, 2in. to 2½in. long; cymes dichotomous, few-flowered; peduncles very long. *l.* 4in. to 9in. long, cordate-ovate, acute, glabrescent or somewhat hairy beneath. India.

A. tiliæfolia (Tilia-leaved). *fl.*, corolla rose-purple, 2in. to 3in. long, widely funnel-shaped; peduncles ½in. to 3in. long, one- to three-flowered. June. *l.* ovate-cordate, 1in. to 4in. in diameter, shortly acuminate or obtuse, hoary or glabrescent beneath. India, 1812. SYN. *Rivea tiliæfolia.*

ARGYRESTHIA CURVELLA. *See* **Apple Shoot Moths.**

ARGYRESTHIA NITIDELLA. *See* **Cherry Moth.**

ARGYROPHYTON DOUGLASII. A synonym of **Argyroxyphium sandwicense** (which *see*).

ARGYRORCHIS (from *argyros*, silver, and *Orchis*; alluding to the silvery network of the leaves). ORD. *Orchideæ.* A monotypic genus. The species is a stove, terrestrial Orchid, allied to **Ancectochilus** (which *see* for culture).

A. javanica (Java). *fl.* pink, small, disposed in loose, sessile spikes; scape 9in. high. *l.* petiolate, broadly ovate, 2in. long, 1½in. broad, dark, velvety olive-green, blotched lighter green, and showing faint golden reticulations, pinkish beneath. Java. (B. H. 1861, 18, under name of *Anœctochilus javanicus.*)

ARIA HOSTII. A synonym of **Pyrus Chamæmespilus Hostii** (which *see*).

ARION ATER and **ARION HORTENSIS.** *See* **Slugs.**

ARIOPSIS (from *Arum*, an allied genus, and *opsis*, resemblance). ORD. *Aroideæ*. A monotypic genus. The species is a small, stove, tuberous herb, closely allied to *Arum*. For culture, *see* **Caladium.**

A. peltata (peltate). *fl.*, spathe violet, with a green dorsal ridge, paler within, incurved, apiculate, 1in. long; spadix shorter than the spathe, decurved, dark purple and green; peduncle 1in. to 4in. long, very slender. *l.* entire, peltate, orbicular or cordate, 1in. to 6in. in diameter, rounded or acute, membranous, glaucous beneath; petioles 2in. to 7in. long. Himalayas. (B. M. 4222.) SYN. *A. protanthera.*

A. protanthera (flowering first). A synonym of *A. peltata.*

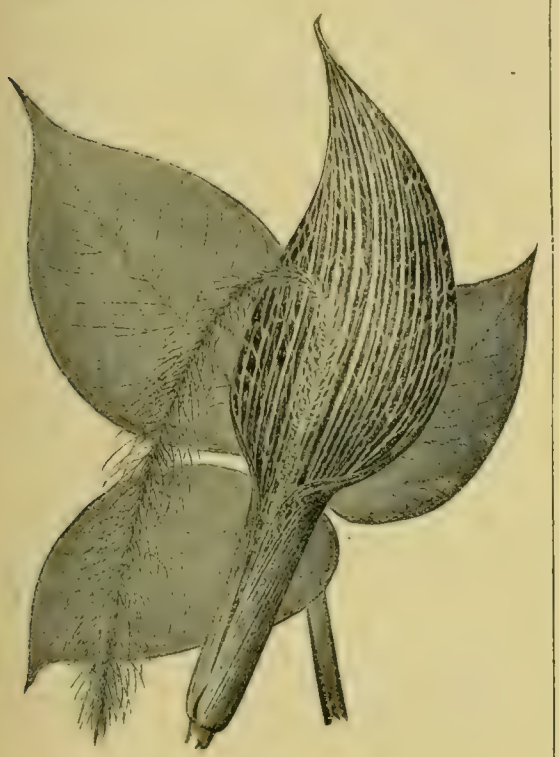


FIG. 78. INFLORESCENCE AND LEAF OF ARISÆMA FIMBRIATUM.

ARISÆMA. The fifty species of this genus are mostly natives of temperate and sub-tropical Asia, a few being North American and one Abyssinian. To those described on pp. 111-2, Vol. I., the following should be added:

A. anomalum (anomalous). *fl.*, spathe 2in. long, the tube striped purplish-brown, the limb dark brownish-purple striped with white, the lower margin forming a recurved border round the mouth of the tube; spadix appendage narrowed upwards; peduncle 9in. high. *l.* solitary, 9in. high, with three to five lanceolate leaflets 4in. to 6in. long and 1½in. broad. Rootstock Iris-like. Straits of Malacca, &c., 1890. Stove. (B. M. 7211.)

A. atrorubens (dark red). The correct name of *A. triphyllum.* SYN. *Arium triphyllum zebrinum* (B. M. 950; L. B. C. 320).

A. Bakerianum (Baker's). This is probably only a small-spathed form of *A. fimbriatum.* 1897.

A. consanguineum (related).* *fl.*, spathe green, 3in. to 7in. long, excluding the long, filiform tip, the limb broadly ovate or ovate-lanceolate, incurved; spadix hardly longer than the tube. *l.* solitary; leaflets ten to twenty, narrowly linear-lanceolate, 3in. to 16in. long, with long, capillary tips; petiole 1ft. to 4ft. long, and (as well as the peduncle) mottled with dark pink and red or brown. Tuber 1in. to 5in. in diameter. Temperate Himalayas, 1893. SYN. *A. Giraldii.*

Arisæma—*continued.*

A. Dracontium (Dragon). The correct name of *Arum Dracontium* (B. R. 668; L. B. C. 1165).

A. enneaphyllum (nine-leaved). A garden synonym of *A. flavum.*

A. fimbriatum (fringed).* *fl.*, spadix cylindrical, slender, the free end covered with slender, purplish threads; spathe brownish-purple, longitudinally banded whitish, oblong, acute or acuminate, convolute at base. *l.* two, deeply divided into three ovate, acute, glabrous segments; petioles long, pale purplish-rose, spotted purple. Philippine Islands, 1884. See Fig. 78, for which we are indebted to Mr. William Bull. (B. M. 7150; G. C. n. s., xxii., p. 689; J. H. 1886, f. 19; R. G. 1886, 357.)

A. flavum (yellow). *fl.*, spathe yellow, green, or the limb faintly purple below, 1in. to 2in. long; spadix conical, included. *l.* two; leaflets nine to eleven, 2in. to 4in. long, the lateral ones sessile, oblong or lanceolate, acuminate, the median one sessile or petiolulate; petioles 8in. to 12in. long. Rootstock globose. Temperate Himalayas, 1891. SYN. *A. enneaphyllum*, of gardens (R. G. 1891, p. 578, f. 103).

A. Giraldii (Giraldi's). A synonym of *A. consanguineum.*

A. Leschenaultii (Leschenault's). *fl.*, spathe green, with broad, dark purple bands, 3in. to 8in. long, the tube as long as the cymbiform, long-caudate-acuminate limb; spadix 4in. long, nearly cylindric. *l.* solitary; leaflets five to eleven, oblanceolate, acuminate, serrulated, 4in. to 6in. long, 1½in. to 2½in. broad; petiole 1ft. to 2ft. long, usually mottled and banded with red and brown. Tuber large. Western Ghats, 1864. SYN. *A. papillosum* (B. M. 5496).

A. Murrayi (Murray's). *fl.*, spathe 3in. to 5in. long, the tube green, striated, ¾in. to 1in. in diameter, the limb white, rather broader. *l.* solitary; leaflets five to nine, ovate- or oblong-lanceolate, acuminate, 4in. to 6in. long; petiole 10in. to 14in. long and (as well as the sub-equal peduncle) mottled with reddish-brown. Tuber large. India, 1847. Stove. (B. M. 4388; F. d. S. 1322.)

A. neglectum (neglected). *fl.*, spathe green, 3in. to 4in. long, the tube swollen at base, the limb oblong-cymbiform, acuminate, recurved at tip; spadix rather stout, much longer than the spathe. *l.* one or two; leaflets four to seven, sessile, elliptic or oblanceolate, cuspidate-acuminate, usually broadest in the middle; petioles green or clouded. Tuber globose. Ceylon, &c., 1864. SYN. *A. Wightii* (B. M. 5507).

A. papillosum (papillose). A synonym of *A. Leschenaultii.*

A. pulchrum (pretty).* *fl.*, spathe purplish, striped with green, 3in. long, the limb narrowed into a decurved tail as long as the tube; spadix much shorter than the spathe. *l.* solitary; leaflets eight to twelve, cuneate-oblanceolate, cuspidate, 4in. to 6in. long, dark green above, somewhat glaucous beneath; petiole (and peduncle) stout, clouded and speckled with pale reddish-brown. Tuber globose. India, 1879.

A. tortuosum (tortuous). The correct name of *A. curvatum* (B. M. 5931).

A. utile (useful). *fl.*, spadix purple; spathe reddish-brown, with greenish ribs and veins, the tube 3in. to 4in. long, the lamina decurved, rarely sub-erect, 3in. to 4in. across. May and June. *l.* in pairs; leaflets three, shortly and stoutly petiolulate or sessile, the middle one broader than long, 5in. to 8in. in diameter. Sikkim Himalaya, 1880. (B. M. 6474.)

A. Wightii (Wight's). A synonym of *A. neglectum.*

A. Wrayi (Wray's).* *fl.*, spathe 5in. to 7in. long, erect, the limb pale yellowish-green or lilac, with darker stripes; spadix very slender, the appendage far exserted; peduncle taller than the petioles. *l.* one to three; leaflets five to nine, petiolulate, narrowly elliptic-lanceolate, 6in. to 10in. long, 1in. to 2in. broad, the tips apiculate or filiform; petioles 1ft. to 1½ft. long, mottled green and white and dotted with red. Tuber rooting all over. Perak, 1889. (B. M. 7105.)

ARISARUM. Only three species compose this genus, which is confined to the Mediterranean region. To that described on p. 112, Vol. I., the following should be added:

A. proboscideum (proboscis-like). *fl.*, spathe erect, greyish-white and inflated below, the upper part olive-green, narrowed into a proboscis which is often 5in. long; spadix included. February.* *l.* solitary or few, 3in. to 4in. long, 1in. to 2in. broad, hastate; petioles 4in. to 6in. high, stout, cylindric. Upper Arno and the Apennines. (B. M. 6634.) *Arum proboscideum* is synonymous with this species.

A. simorrhinum (monkey's nose). *fl.*, spathe purplish, or the blade greenish; spadix appendage short, thick; peduncle shorter than the petiole. December. *l.* solitary, sagittate-ovate, triangular-sagittate, or hastate-triangular; petiole three or four times longer than the blade. Algeria, 1596. (B. M. 6023, under name of *A. vulgare.*)

A. vulgare (common), of Hooker. A synonym of *A. simorrhinum.*

ARISTEA. This genus embraces about twenty-five species, natives of tropical and South Africa and Madagascar. To those mentioned on p. 112, Vol. I., the following should be added:

A. corymbosa (corymbose). The correct name of *Witsenia corymbosa.*

A. platycaulis (broad-stemmed). *fl.*, perianth blue, the segments oblong, ¼in. long; pedicels small; inflorescence an ample panicle 3in. to 9in. long, with all the rachises much flattened, the lower branches overtopped by their subtending leaves. April. *l.*, radical ones ensiform, firm, 1ft. long, 1in. broad. 1887.

ARISTOLOCHIA. About 180 species are included here, and they are broadly dispersed over the temperate and warmer regions. To those described on pp. 112-3, Vol I., the following should be added:

A. altissima (very tall). *fl.* pale yellowish-brown, striped reddish-brown; perianth about 1½in. long, the tube gradually enlarged to the limb, which is yellow within. June to August. *l.* bright, glossy green, petiolate, 2in. to 3in. long, ovate-cordate, obtuse or acute, waved; petioles ½in. to ¾in. long. Sicily and Algeria. Half-hardy. (B. M. 6586.)

A. arborea (tree-like). *fl.* brown and purple, produced in fascicle-like panicles from the base of the trunk; calyx fleshy-coriaceous, the throat closed by an orbicular process. *l.* ample, oblong - elliptic, acuminate, obtuse at base, pinnatinerved, reticulated and pubescent beneath, shortly petiolate. Stem erect, somewhat arborescent; branches densely fuscous-pubescent. Mexico, 1862. Stove. (B. M. 5295.)

A. Bonplandi (Bonpland's). A synonym of *A. fimbriata.*

A. brasiliensis (Brazilian). *fl.* pale, reticulated and spotted with dark purple, borne on long peduncles. *l.* reniform, very obtuse, with a deep sinus and large auricles at base. Stems striated, smooth. Brazil, 1620. Stove.

A. b. macrophylla (large-leaved). The correct name of *A. ornithocephala.*

A. ciliata (ciliated). A synonym of *A. fimbriata.*

A. Dammeriana (Dr. Dammer's). *fl.*, perianth nearly 2in. long, the lower portion distended and oblique, expanding into a trumpet-shaped tube terminated by a limb which is two-lobed on one side and on the other is prolonged into a tail-like expansion; peduncles axillary, one-flowered. *l.* about 7in. long, 2½in. broad, oblong, acuminate, cordately bilobed at base. Old stems covered with corky bark. Central America, 1895. Stove.

A. elegans (elegant).* *fl.* solitary, on long pedicels; perianth tube pale yellowish-green, 1½in. long, rather inflated, the limb suddenly expanding into a nearly shallow cup, which externally is white, veined purple, and internally rich purplish-brown, with irregular, white marks. August. *l.* 2in. to 3in. long and broad, broadly reniform-cordate; petioles 1in. to 2½in. long, very slender. Brazil, 1883. Stove climber. (B. M. 6903.)

A. elegans-brasiliensis (hybrid).* *fl.* about 8in. long, of which the distended tube occupies 2½in. and is creamy-yellow, blotched with purple along the nerves; upper lip cream-coloured, purple-spotted, about 4in. long; throat of the perianth clear yellow, with purple veins. *l.* as in *A. brasiliensis*, but less glaucous. 1897. Stove. The first recorded hybrid *Aristolochia.* (G. C. 1897, xxii., p. 126, f. 36.)

A. fimbriata (fringed). The correct name of the plant known in gardens as *A. Bonplandi*, *A. ciliata* (B. M. 3756), and *A. ciliosa* (B. 90).

A. Giberti (Gibert's). *fl.* green, spotted with dark purple, axillary, solitary; peduncles half as long as the petioles. October. *l.* orbicular-reniform, very obtuse, with a deep sinus and large rounded auricles at base, pedately seven-nerved, pale beneath. Stems slender, sulcate-angular. Brazil, 1862. Stove. (B. M. 5345.)

A. gigas. Pelican Flower. SYN. *A. grandiflora* (of B. M. 4368, not Swartz).

A. glandulosa (glandular). *fl.* green and brown, rather large, axillary, solitary; lip refracted, obovate-spathulate; peduncles striated, rather longer than the petioles. May. *l.* 2½in. long, cordate-hastate, obtuse, with rounded auricles, villous on both sides; petioles 1½in. long. Cuba. Stove.

A. g. glabra (smooth). This resembles the type, but is larger, and has the stem and leaves highly glabrous. Mexico, 1846. Hardy. SYN. *A. macradenia* (B. M. 4467).

A. grandiflora (large-flowered). A synonym of *A. gigas.*

A. g. Sturtevanti (E. D. Sturtevant's).* *fl.* very large, spotted and veined with crimson; throat deep, velvety crimson, widely expanded. New Jersey, 1891.

A. hians (gaping). *fl.* bronzy-green outside, the veins and margin of the beak light yellowish-green, the inside of the broad lobe dull yellowish-green, marked purple-brown, the inside of the beak covered with brownish-purple hairs, the inside of the inflated tube pale greenish, hairy, spotted purple-brown in the upper half. September. *l.* roundish in outline, deeply cordate at base, obtusely rounded at apex, green, reticulated beneath;

Aristolochia—*continued.*

stipules 1in. in diameter, with wavy margins. Venezuela, 1887. Stove. (B. M. 7073.)

A. longicaudata (long-tailed). *fl.* creamy-white, with purple veins, large. *l.* (and habit) as in *A. brasiliensis.* British Guiana, 1890. "A handsome, robust, stove species of the unilabiate group, in which the solitary lip of the flower is prolonged into a very long tail." (G. C. 1890, viii., p. 493, f. 98.)

A. longifolia (long-leaved). *fl.* purplish-brown, of a good size; tube yellowish, with dull purplish veins outside, abruptly bent upon itself; limb roundish, about 2½in. in diameter, the lower part bent as if pinched in the middle. *l.* long, linear-lanceolate, acuminate. Stems long, climbing. Rootstock short, woody. Hong Kong, 1886. Stove. (B. M. 6884.)

A. macradenia (large-glanded). A synonym of *A. glandulosa glabra.*

A. pandurata (fiddle-shaped). *fl.* of an intense violet, lined and reticulated with paler violet or yellow, paler and unspotted outside, large, axillary, solitary; peduncles longer than the petioles. September. *l.* very variable; the lower ones usually hastate-panduriform, the upper ones hastate-cordate, acute, with a deep sinus at base. Stems woody. *h.* 10ft. Caraccas, 1823. Stove. SYNS. *A. panduriformis*, *A. picta* (F. d. S. v., p. 521; L. & P. F. G. i., p. 9).

A. panduriformis (fiddle-shaped). A synonym of *A. pandurata.*

A. picta (painted). A synonym of *A. pandurata.*

A. ridicula (ridiculous). *fl.* 3½in. to 4½in. long; tube dull whitish, veined purplish-brown, bent upon itself, the basal part inflated; limb shortly revolute, prolonged from the upper part of the sides into two long lobes, "reminding one of a donkey's ears"; they are tawny or cream, with dark purplish-brown, dendritic markings, sparsely purple-brown hairy. *l.* bright green, orbicular or orbicular-reniform, cordate at base, covered with short hairs. Stem, petioles, and pedicels clothed with spreading hairs. Brazil, 1886. Stove climber. (B. M. 6934; G. C. n. s., xxvi., p. 361.)

A. Roxburghiana (Roxburgh's). *fl.* in racemose, puberulous cymes; perianth pale green, 2in. to 2½in. long, the lip as long as the tube. September. *l.* 4in. to 8in. long, cordate, the upper ones often narrowly lanceolate, the lower ones (or all) ovate or broadly ovate-oblong, pedately five- to seven-nerved. India, 1881. Stove.

A. salpinx (trumpet). *fl.* about 1½in. long, inflated at base, then abruptly constricted and bent upwards in the form of a dorsally compressed, trumpet-shaped tube, with an oblique mouth, outside cream-coloured, with purple network of veins, inside lighter, the upper lip with a yellow central blotch and numerous purplish spots around it, the margins slightly reflexed, marked with purple lines and having a few short, purple hairs. *l.* cordate-ovate, acuminate, glabrous, 4in. to 6in. long, 2½in. to 3in. broad. Paraguay, 1886. Stove. (G. C. n. s., xxvi., pp. 456-7.)

A. Serpentaria (serpent-like). *fl.* near the base of the stem, on bracteate, spreading peduncles; calyx dull purple, three-lobed, shaped like the letter S. June to August. *l.* 2in. to 4in. long, ovate to linear-lanceolate, cordate or hastate at base, shortly petiolate. Stems pubescent, zigzag and leafy above. North America, 1632. A hardy, deciduous trailer.

A. Sturtevantii (E. D. Sturtevant's). A variety of *A. grandiflora.*

A. Westlandi (A. B. Westland's). *fl.* pendulous, chiefly produced from towards the base of the plant; perianth tube brown and yellow, cylindric, the limb pale greenish-yellow, veined and speckled purple, 6in. long, broadly rounded-ovate; peduncles 3in. to 5in. long, one-flowered. March. *l.* 6in. to 10in. long, shortly petiolate, narrowly oblong-lanceolate, acuminate, glabrous above, strongly nerved and pubescent beneath. Stem short, woody; branches tall-climbing. China, 1886. Stove. (B. M. 7011.)

ARISTOMENIA. A synonym of **Stifftia** (which *see*).

ARISTOTELA. A synonym of **Othonna** (which *see*).

ARISTOTELEA (of Loureiro). A synonym of **Spiranthes** (which *see*).

ARISTOTELIA. SYN. *Friesia.* About ten species of hardy or half-hardy shrubs are included in this genus; they are natives of Chili, Tasmania, the New Hebrides, New Zealand, &c. Flowers axillary or lateral, racemose, often polygamous; sepals and petals four or five, the latter three-lobed, toothed, or nearly entire. Berries small. Leaves often nearly opposite, entire or toothed.

As the Aristotelias are not hardy in all parts of the country, they should not be planted in the ordinary shrubbery border unless the site is a very favourable one.

Aristotelia—*continued.*

The points of the shoots are frequently damaged by light frosts, and in severe winters the growths are cut down almost to the ground. Aristotelias well deserve a place against a wall.

To the species described on p. 113, Vol. I., the following should be added:

A. Braithwaitei (Braithwaite's). This is described as a beautiful plant, having large flowers with (white?) fringed petals. It is said to be intermediate in character between *Elæocarpus* and *Aristotelia*, having the floral characteristics of the former, and the foliage and inflorescence of the latter. New Hebrides, 1881.

A. racemosa (racemose). *fl.* small; racemes panicled, many-flowered, axillary. *l.* on long petioles, membranous, pubescent, 3in. to 5in. long, ovate-cordate or oblong-lanceolate, acuminate, deeply and irregularly serrated, often red or purple beneath. *h.* 6ft. to 20ft. New Zealand, 1873.

ARM. A large branch of a Vine, trained horizontally.

ARMADILLO VULGARIS. *See* **Oniscidæ.**

ARMED. Furnished with prickles, spines, or thorns.

ARMENIACA MUME. Another name for **Prunus Mume** (which *see*).

ARMERIA. SYN. *Statice* (in part). According to some authors, the number of species is upwards of fifty: while others reduce the number to six or seven. The genus is mostly represented in Europe, North Africa, and Western Asia.

The value of the Thrifts lies chiefly in their compact tufted habit, in their adaptability for sunny situations, and their utility for edgings, *A. alpina*, *A. maritima alba*, and *A. m. Laucheana* being the best for the purpose. *A. latifolia* is commonly known as the Giant Thrift, and is very free, the flowers being large and of a nice rosy-crimson. The form Rose Beauty is, however, superior generally to the type. These last make nice pot-plants.

To the species described on pp. 113-4, Vol. I., the following should be added:

A. alliacea (Allium-like). A synonym of *A. dianthoides*.

A. alpina (alpine). A synonym of *A. vulgaris*.

A. cæspitosa (tufted). *fl.* pale lilac, in small heads; involucral leaflets brownish; scape pubescent. Summer. *l.* very short, narrow-linear, triquetrous, rigid, recurved. *h.* 1in. to 2in. Roots forming dense tufts. Mountains of Spain, 1885. The smallest of the Thrifts. (B. M. 7596; R. G. 1192, f. 2.)

A. latifolia (broad-leaved).* *fl.* disposed in a large, globose head; petals pale rose-colour, obovate; involucral bracts pale brown; scape tall. April. *l.* 3in. to 5in. long, narrow-oblanceolate, acute or acuminate at apex, gradually narrowed to the petioles, glaucescent. Portugal. (B. M. 7313.) *A. latifolia* is not synonymous with *A. cephalotes*, the correct name of which is *A. mauritanica*.

A. undulata (wavy). *fl.* white, with white bracts, borne in a large head on a tall scape. Summer. *l.*, lower ones lanceolate or lanceolate-linear, often sinuate-toothed, three-nerved; the rest linear or bristle-like, acute. Greece, 1888. Plant highly glabrous, tufted.

ARMERIASTRUM. A synonym of **Acantholimon** (which *see*).

ARMILLARIA MELLEA. *See* **Agaricus.**

ARMORACIA. Included under **Cochlearia** (which *see*).

ARMY WORM (*Leucania unipuncta*). The insect known popularly in the United States by the above name is the larva of a Moth 1½in. in wing expanse, and of a yellowish colour dotted with black. It is very rarely seen in this country. In America and elsewhere, however, it is one of the greatest pests with which the agriculturist has to contend. Like the rest of its congeners it is a Grass-feeder, though none of them are over-fastidious. The name Army Worm has been applied on account of the enormous numbers which in certain seasons swoop down upon the Grass crops. Fortunately the pest is kept in check by a host of insect parasites, or the consequences would be still more disastrous. Applications of Paris Green, and the digging of deep trenches in the fields are both successfully employed. So far as can be traced it has not done any damage in this country.

ARNEBIA. SYNS. *Dioclea*, *Meneghinia*, *Stenosolenium*, *Strobila*, *Toxostigma*. About a dozen species, natives of North Africa and Western and Central Asia, are included in this genus; they are mostly hardy, annual or perennial, hispid herbs. Flowers yellow or violet, sub-sessile, in simple racemes or branched cymes; calyx five-cleft or five-parted; corolla tube straight, the five lobes imbricated, spreading; stamens included. Leaves alternate. Roots tinged with red. To the species described on p. 114, Vol. I., the following should be added:

A. cornuta (having horns). *fl.* deep yellow, having at first five black spots at the base of the lobes, which change to brown and finally disappear; raceme erect, leafy. *l.* lanceolate, dark green, hairy; lower ones obtuse; upper ones acute. *h.* 1½ft. Afghanistan, 1888. A pretty annual.

A. macrothyrsa (large-thyrsed). *fl.* yellow, produced in dense trusses. *l.* 4in. to 7in. long. *h.* 1ft. to 1½ft. Armenia, 1891. A fine, showy perennial.

ARNICA. There are about ten species of this genus, natives of Europe, Asia, and North America. Flower-heads yellow, large, radiate, heterogamous, borne on long peduncles; involucral bracts in one or two series, acuminate. Leaves usually crowded at the base of the stem, opposite, entire or toothed. *See also* **Aster, Doronicum,** and **Mairia.**

A. montana is a very choice plant for the rockery or for the front of the mixed border. It is one of those Composites which are best grown in a sunny spot, when its orange-yellow flower-heads will be plentifully produced.

ARNOPOGON. A synonym of **Urospermum** (which *see*).

AROMIA MOSCHATA is the name by which the elegant Musk Beetle is known to science. In Vol. II. of this work the insect is fully described, and this description, together with the illustration (Fig. 79), will enable the gardener to readily identify the insect. It affects tree-trunks in the daytime, but gets more active as evening approaches. These wood-feeding insects are very objectionable by reason of the fact that the larvæ remain in that condition considerably longer than is the case with insects generally. When captured these Beetles emit a noise which has been translated into a squeak, but which in reality is the result of friction, as already noted. If these Beetles are left in undisturbed possession, they will in time so tunnel the tree in every direction that little of the heart-wood remains. *See also* **Musk Beetle.**

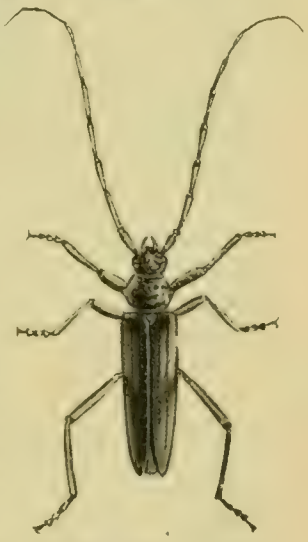


FIG. 79. MUSK BEETLE (*Aromia moschata*). (Natural size.)

ARRACACIA is the correct name of *Arracacha*. The genus embraces about a dozen species of perennial herbs, all American. Flowers white; involucral bracts leafy or wanting. Leaves pinnate or pinnately decompound.

ARSENITES. Two of the most valuable Arsenites of Copper and of Lime respectively are at the present day employed as insecticides in the form of **Paris Green** and **London Purple** (which *see*). Both compounds are virulent poisons.

ARTABOTRYS. This genus includes about fifteen species of sarmentose or climbing, stove shrubs, natives of tropical Asia and Africa. Flowers solitary or fascicled; sepals three, cohering at base; petals six, free; stamens numerous; peduncles often hard, hooked.

ARTANEMA. SYNS. *Archimenes* (of Vahl), *Diceros.* This genus embraces three species (closely related), natives of tropical Asia and Australia. *A. fimbriatum* is the only one introduced.

ARTEMISIA. Including *Absinthium.* This genus embraces about 150 distinct species (about 200 have been described as such), mostly natives of the Northern hemisphere, but a few are found in South America and the Sandwich Islands. Four are indigenous in Britain. To those described on p. 115, Vol. I., the following should be added:

A. Absinthium (Absinthium). Common Wormwood. *fl.-heads* dingy yellow, rather large, hemispherical, drooping; ray florets very short; panicles erect, leafy. August. *l.* bipinnatifid, clothed with short, silky down; segments lanceolate. *h.* 1ft. to 1½ft. Europe (Britain). *See* **Wormwood.**

A. tridentata (three-toothed). *fl.-heads* densely paniculate; outer bracts short, tomentose-canescent. *l.* cuneate, obtusely three-toothed or three-lobed, silvery, persistent. *h.* 1ft. to 12ft. North America, 1894. A thick-growing bush.

ARTHROCHILUS. A synonym of **Drakæa** (which *see*).

ARTHROPTERIS TENELLA. A synonym of **Polypodium tenellum** (which *see*).

ARTHROSOLEN (from *arthron*, a joint, and *solen*, a tube). ORD. *Thymelæaceæ.* A genus comprising ten species of greenhouse shrubs, with the habit of *Wikstræmia* or *Gnidia*, natives of South Africa, one extending into the tropics. Flowers hermaphrodite, disposed in spikes or heads; stamens eight, rarely ten. Leaves sparse, flat. *A. laxus* and *A. spicatus* (L. B. C. 755 and 311, under names of *Passerina laxa* and *P. spicata*) have been introduced, but are probably lost to cultivation.

ARTHROSTEMMA. SYN. *Heteronoma.* Six species, natives of Mexico, Venezuela, Peru, Colombia, and the West Indies, form this genus. *See also* **Brachyotum.**

ARTHROZAMIA. A synonym of **Encephalartos** (which *see*).

ARTICHOKE, JERUSALEM. *Varieties:* Until recently only the old well-known Jerusalem Artichoke was grown; this will probably be superseded by a variety named the New White. This sort is as prolific as the old one, the tubers are of better form and paler in colour, and are also considered by many to be of better flavour.

ARTOCARPUS. SYN. *Sitodium.* This genus includes about forty species, natives of tropical Asia. Flowers small, very numerous, in globose or oblong, crowded heads; peduncles axillary, solitary. Leaves alternate, ample, penniveined, entire or pinnately few-lobed.

A. Cannoni. The correct name is *Ficus Cannoni.*

A. integrifolia is known as the Jaca or Jack-tree. (B. M. 2833-4.)

ARUBA. A synonym of **Almeida** (which *see*).

ARUM. As at present arranged this genus includes about two dozen species, natives of Europe, the Mediterranean region, and Western Asia as far as Afghanistan. To those described on p. 118, Vol. I., the following should be added. A number of species formerly classed under this genus are now referred to **Amorphophallus, Arisæma, Arisarum, Biarum, Caladium, Helicodiceros, Sauromatum, Synantherias, Typhonium, Xanthosoma,** &c.

A. corsicum (Corsican). A synonym of *A. pictum.*

A. detruncatum (abruptly cut). *fl.*, spathe greenish-yellow, spotted with purple, the blade lanceolate, acuminate, three times as long as the tube; peduncle much shorter than the petioles. *l.* hastate, the posterior lobe sometimes almost horizontally truncate. Asia Minor, 1889.

Arum—*continued.*

A. Dioscoridis (Dioscorides').* *fl.*, spathe varying in colour, the tube oblong, the blade oblong-lanceolate. *l.* hastate or sagittate, the oblong- or ovate-triangular anterior lobe sometimes twice as long as the posterior one; petioles twice or thrice as long as the leaves. *h.* 1ft. Levant.

A. D. Smithii (Smith's). The correct name of *A. spectabile* (R. G. 1872, t. 742).

A. D. spectabile (remarkable). *fl.*, "spathe reddish-purple passing into green above with spots, 20in. long; peduncle 3ft. high. *l.* much undulated." (Kew Bulletin, 1898, App II.)

A. Dracunculus. The correct name is *Dracunculus vulgaris.*

A. D. syriacum (Syrian). *fl.*, spathe dark purple below, pale purple in the middle, spotted with dark purple, greenish above; spadix appendage cylindrical. Syria, 1859. SYN. *A. Liepoldii.*

A. elongatum (lengthened). A form of *A. orientale.*

A. gratum (pleasing). A form of *A. orientale.*

A. hygrophilum (moisture-loving). *fl.*, spathe tube purple or whitish at base, ovoid, the limb pale green, margined with purple, more or less acuminate, about 2½in. long; spadix appendage purple, 2in. long; peduncle 8in. to 12in. long. *l.* elongated-sagittate-hastate; petioles nearly three times as long as the blade. Syria, &c., 1860.

A. italicum. SYN. *A. numidicum.* A vigorous form, introduced in 1894, is known as *A. modicense.*

A. Liepoldii (Liepold's). A synonym of *A. Dracunculus syriacum.*

A. Magdalenæ (Magdalen's). This is very closely allied to *A. palæstinum*, but has a yellow spathe, marbled and spotted with purple. Palestine, 1894.

A. modicense (Modica). A form of *A. italicum.*

A. numidicum (Numidian). A synonym of *A. italicum.*

A. orientale. The following varieties may be mentioned:

A. o. elongatum (lengthened). *fl.*, spathe purplish outside, margined with purple on the inside, long-acuminate. Caucasus, 1882.

A. o. gratum (pleasing). *fl.*, limb of the spathe of a pleasing greenish-yellow, with purple markings. Lebanon, &c., 1859.

A. o. Petteri (Petter's). *fl.*, spathe oblong-lanceolate, acuminate, pale greenish-yellow with a broad purple margin, or wholly purple. Dalmatia, 1860.

A. Petteri (Petter's). A form of *A. orientale.*

A. philistæum (Philistian). *fl.*, spathe tube whitish within, the blade saturated with purple and spotted, four times as long as the tube; spadix much shorter than the spathe; peduncle 6in. to 8in. long. *l.* hastate-sagittate, 6in. to 8in. long, with very prominent nerves; petioles 10in. to 12in. long. Palestine, 1859.

A. proboscideum. The correct name is *Arisæma proboscideum.*

A. sanctum (sacred). *fl.*, spathe of a velvety blackish-purple, large; spadix black; peduncle long. *l.* large, cordate-triangular. Tuber large and flat. Palestine, 1889.

A. spirale. The correct name is *Cryptocoryne spiralis.*

ARUNCUS. *See* **Spiræa Aruncus.**

ARUNDINA (a diminutive of *Arundo*; in allusion to the Reed-like stems). ORD. *Orchideæ.* A small genus (about five species) of erect, terrestrial, leafy Orchids, natives of the East Indies, South China, and the Malayan Archipelago. Flowers rather large, in terminal, loose, simple or rarely divided racemes; sepals sub-equal, free, spreading; petals similar or broader; lip erect at the base of the rather long, erect column, which is surrounded by the lateral lobes. Leaves flat, narrow or rather broad, sessile, with articulated sheaths. Stems erect, Reed-like, invested with the leaf-sheaths. Pseudo-bulbs wanting. The species introduced should be grown in a cool part of the East Indian house. Rough, fibrous peat and loam form the best compost, as the plants are devoid of pseudo-bulbs, and require richer soil than many other Orchids. Copious supplies of water and plenty of light, but shading in hot sunshine, are essential to success in the culture of Arundinas. Propagation may be affected by divisions, or by potting the young plants that are produced on the stems.

Though some six species of this genus are known, only one, *A. bambusæfolia*, is at present in cultivation. This requires a light position in the Dendrobium-house, where only the bright rays of the sun are broken sufficiently to prevent scorching. During the growing season abundance of moisture, both at the roots and in the atmosphere, is required, with cooler conditions during the resting period.

Arundina—*continued.*

Belonging to the terrestrial class of Orchids, the potting-compost should consist of good fibrous peat and loam, to which should be added a liberal sprinkling of rough sand or broken crocks to keep the material in a porous condition. The drainage also should be ample, so that there may be no possibility of stagnation.

A. bambusæfolia (Bamboo-leaved). *fl.* large; sepals and petals pale magenta-rose; lip rose, striped orange on either side the white throat. July to autumn. *l.* pale green, ensiform. Stems 3ft. to 5ft. high. Nepaul, Birma, &c. (B. M. 7284; W. O. A. iii. 139.) SYNS. *Bletia graminifolia, Cymbidium bambusæfolium.*

A. densiflora (dense-flowered). *fl.* rosy-violet, as large as those of *B. bambusæfolia*, scented, the lip bordered crimson; racemes close, head-like. *l.* lanceolate, sub-equal, sheathing. Stems 3ft. high. Singapore, 1842. (B. R. 1842, 38.)

A. Philippi (Philipp's). This is closely related to *A. bambusæfolia*, but is distinguished in having narrower leaves and smaller flowers; the latter are pale lavender, 1½in. across, with a blotch of crimson on the lip. 1895.

ARUNDINARIA. SYNS. *Ludolfia, Macronax, Miegia, Triglossum.* Including *Thamnocalamus.* This genus includes about two dozen species, natives of Asia and America, and mostly tropical. To those described on p. 118, Vol. I., the following should be added. For exhaustive information on the genus and its allies the reader is referred to A. B. Freeman-Mitford's excellent work "The Bamboo Garden" (London, 1896). *See also* **Bambusa.**

A. anceps (two-edged).* This principally differs from *A. nitida* in the leaf-sheaths having a circular fringe of short, bristly white hairs at the insertion of the leaf, and in the stems, purple at first, ripening to a greenish-brown tint. Origin unknown.

A. aristata (bristly). *l.* bright green, slightly glaucous beneath, 4in. long, ¼in. to ⅜in. broad, acuminate, slightly serrated, prettily tessellated; sheaths fringed with short, silky hairs. Stems 8ft. to 12ft. high, purplish-brown; nodes rather prominent. Himalayas.

A. auricoma (golden-haired).* *l.* 5in. to 7in. long, 1in. broad, "pinched in" about ½in. from the sharp point, rounded at base, boldly striped with bright yellow, serrated, velvety beneath; petioles well defined; sheaths hairy at base. Stems 3ft. high, ¼in. thick, purple, fistulous; nodes prominent, 3in. to 5in. apart. China and Japan. An ornamental, dwarf species, with which *A. Maximowiczii* is probably identical. SYN. *A. Fortunei aurea.*

A. chrysantha (golden-flowered). *l.* tessellated, 5in. to 7in. long, ½in. to ⅝in. broad, showing slight variegation; sheaths very hairy on one edge. Stems 5ft. or more in height, fistulous, very slender; nodes not prominent, having a sharp lower rim; branches numerous. China and Japan. This plant is quite hardy.

A. Falconeri (Falconer's). *l.* 3in. to 6in. long, oblong-lanceolate, thin, pointed, slightly serrated, petiolate, with striated venation on the upper surface. Stems tall, ¼in. to ⅜in. thick, smooth when young, scurfy-white when old, often striped with yellow and green; nodes raised; internodes 8in. to 15in. long; branches many at the nodes. Temperate Himalayas. SYNS. *Bambusa gracilis* (of gardens), *Thamnocalamus Falconeri.*

A. Fortunei (Fortune's).* *l.* about 5in. long, ½in. to ¾in. broad, serrated, pinched in towards the point, rounded at base, tessellated, bright green, with a well-defined, white-striped variegation; petioles white. Stems round, fistulous, green, erect, about 3ft. high; nodes often hidden by the overlapping sheaths; branches long, solitary or in pairs. China. SYN. *Bambusa Fortunei.* There are two varieties: *variegata* and *argentea vittata.*

A. F. aurea (golden). A synonym of *A. auricoma.*

A. F. viridis (green). A synonym of *A. humilis.*

A. gigantea (gigantic). A synonym of *A. macrosperma.*

A. Hindsii (Hinds'). *l.* at first erect, at length nodding, some of them attaining 9in. in length and ⅜in. in breadth, glaucous-green, tapering to a rather long petiole, pinched in about 1in. from the sharp point, thicker than usual, slightly hairy, serrated; sheaths slightly hairy on the top. Stems 7ft. or more in height, erect, round; nodes rather long, flat below, prominent above; internodes 3in. to 7in. long, covered with a white, waxy secretion. Hong Kong, 1894. SYN. *Bambusa erecta.*

A. H. graminea (Grass-like). This has narrower leaves and shorter stems than the type. 1894. SYN. *Bambusa graminea.*

A. humilis (dwarf). *l.* paler than usual, smooth, serrated, 4in. to 6in. long, ¾in. broad, finely pointed at apex, rounded at base; petiolate. Stems slender, 2ft. to 3ft. high, fistulous, round; nodes not very prominent; internodes 2in. to 5in. long; branches very long. China and Japan. SYN. *A. Fortunei viridis.*

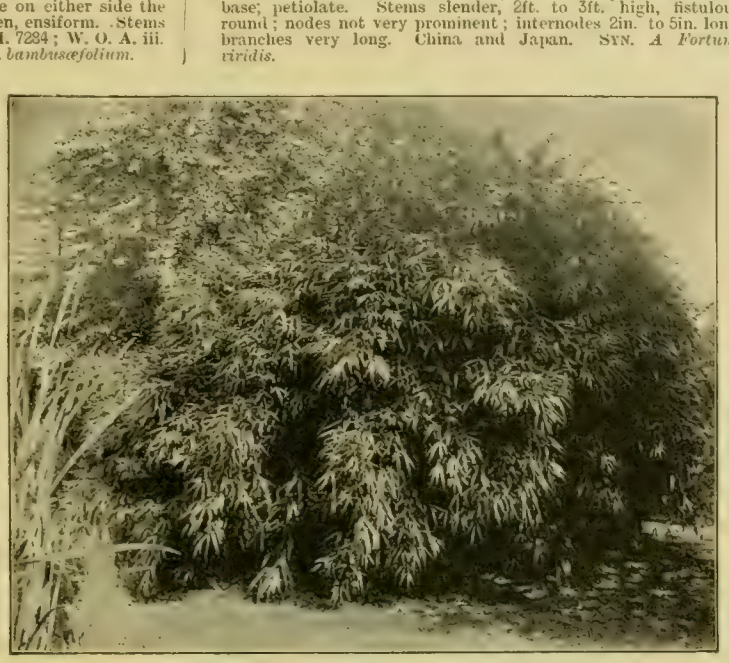


FIG. 80. ARUNDINARIA JAPONICA.

A. japonica (Japanese). The correct name of *A. Metake.* See Fig. 80.

A. khasiana (Khasia Hills). *l.* 3in. to 4in. long, ¾in. broad, linear-lanceolate, glandular between the nerves, not (or hardly) tessellated. Stems annual, dark green or blackish; nodes prominent; branchlets fascicled, dark-coloured. Khasia Hills. Closely allied to *A. falcata.* The *A. khasiana* of gardens is synonymous with *A. nitida.*

A. macrosperma (large-seeded). *l.* lanceolate, acuminate, 1in. to 2in. wide, smoothish, rounded at base, petiolate, tessellated. Stems arborescent, from 10ft. to 20ft. high, rigid, simple the first year, branching the second, afterwards at indefinite periods fruiting, and soon after decaying. United States, 1800. SYNS. *A. gigantea, Bambusa Hermanni, B. Neumanni.*

A. metallica (metallic). *l.* spreading, 6in. to 9in. long, 1½in. across, acutely pointed, deep green, with a very pale midrib. Stems stout, carrying about half-a-dozen leaves towards the apex. 1898. A dwarf-growing species.

A. nitida (shining).* *l.* 2in. to 3in. long, ¼in. broad, brilliant green, lancet-shaped, serrated, especially on one edge; petioles almost wanting; sheaths purple, downy. Stems 8ft. or more in height, ¼in. thick, deep blackish-purple, branching the second year, each branch bearing four leaves. China and Japan, 1894. SYN. *A. khasiana* (of gardens).

A. nobilis (noble). *l.* linear-lanceolate, 2in. to 3in. long, ¼in. to ½in. broad, tapering to a point, slightly serrated, purple-edged, borne on dark purple petioles. Stems round, slender, straight, yellowish, with purple-brown nodes; internodes about 7in. long. Native country unknown.

A. pumila (dwarf). *l.* about 5in. long, ½in. to ¾in. broad, abruptly pointed at apex, rounded at base, petiolate, tessellated, serrated, bright green, rather rough. Stems 1½ft. or more in height, round, fistulous, very slender, not much branched; nodes not prominent, but well defined, with a waxy deposit on the under-side; internodes about 2½in. long. China and Japan. This species is quite hardy.

A. racemosa (racemose).* *l.* 4in. to 7in. long, ½in. to ⅝in. broad, linear-lanceolate, tessellated, scabrous-serrulated, rounded or narrowed into very short petioles, glabrous or scarcely hairy

Arundinaria—*continued.*

above. Stems erect from a long rhizome, 5ft. to 15ft. high, ¾in. to 2in. thick, the nodes mere rings; internodes blue-green when young; branches fascicled at the nodes. India.

A. Simoni (Simon's).* *l.* tessellated, variable in size, usually about 10in. long and ¾in. broad, green above, glaucous below, serrated, finely pointed. Stems 13ft. high or more, round, furnished from top to bottom with sheaths, the upper edges of which are fringed. China and Japan, 1862. (B. M. 7146.) SYNS. *Bambusa Simoni, B. Narihira.* See Fig. 81, for which we are indebted to the "Gardeners' Chronicle."

FIG. 81. ARUNDINARIA SIMONI.

Arundinaria—*continued.*

A. S. striata (striped). *l.* striped with silvery variegation. Stems dwarfer than in the type. SYNS. *Bambusa Maximowiczii, B. plicata.*

A. spathiflora (spathe-flowered). *l.* two to four at the ends of the branches, 3in. to 5in. long, ½in. to ¾in. broad, linear-lanceolate, tessellated, acute at apex, narrowed at base, shortly petiolate, hairy. Stems 12ft. to 20ft. high, ½in. to ¾in. thick, smooth, glaucous-green and scurfy when young, yellow or reddish-brown when old; nodes prominent; internodes 6in. to 15in. long; branches principally from the upper nodes. Western Himalayas. SYN. *Thamnocalamus spathiflorus.*

A. Veitchii (Veitch's).* *l.* tessellated, 7in. long, 2½in. broad, green above, glaucous beneath, much serrated, rounded at base, pinched in towards the apex and ending in a sharp point; petioles purple above, yellow below. Stems about 2ft. high, ½in. thick, rich purple; nodes not very prominent; internodes 3in. to 4in. long.

ARUNDINELLA (a diminutive of *Arundo*, the name of an allied genus). SYNS. *Acratherum, Brandtia, Goldbachia, Thysanachne.* ORD. *Gramineæ.* A genus comprising about two dozen species of tall or dwarf Grasses, diffused over tropical regions. Spikelets acute or acuminate, twin at the sides of the branchlets; glumes four; panicle terminal, variable. Leaves flat, flaccid. *A. anomala*, introduced from Japan in 1889, is described as a hardy, dwarf Grass, suitable for lawns, and only requiring to be cut twice a year.

ARUNDO. Indian Grass; Lady's Laces; Painted Grass; Water Reed. SYNS. *Amphidonax, Donax, Scolochloa.* There are six or seven species of this genus, natives of the Mediterranean region, India, America, New Zealand, &c. To those described on pp. 118-9, Vol. I., the following should be added:

A. madagascariensis (Madagascar). A tall Reed, growing from 10ft. to 20ft. high, and bearing feathery panicles similar to those produced by Pampas Grass. Asia, Africa, and Madagascar, 1893.

A. Phragmites (Phragmites). A synonym of *Phragmites communis.*

ASAGRÆA. A synonym of **Schœnocaulon** (which *see*).

ASAPHES. A synonym of **Morina** (which *see*).

ASARINA. Included under **Antirrhinum** (which *see*).

ASARUM. SYN. *Heterotropa.* According to W. B. Hemsley (G. C. April 5th, 1890), this genus now includes about eighteen species, mostly natives of North temperate regions. Flowers terminal, solitary, shortly pedunculate; stamens twelve (rarely eight?); filaments rather thick or very short. Leaves usually long-stalked, cordate, reniform, or almost

Asarum—*continued.*

hastate. To the species described on p. 119, Vol. I., the following should be added:

A. albivenium (white-veined). This species is similar to *A. (Heterotropa) parviflora*, but has longer-stalked, yellowish flowers with red spots and white-veined leaves. Japan, 1864. (R. G. 1864, t. 440.) SYN. *A. leucodictyon.*

A. caudigerum (tail-bearing). *fl.* green, speckled with red and reddish-brown; perianth tube villous within, the lobes triangular-ovate, each narrowed into a slender tail 1in. or more in length; peduncle shorter than the petioles. January. *l.* two, radical, 2in. to 3in. long, broadly ovate-cordate, with a deep, narrow sinus. Southern China, 1890. Plant stemless, clothed with long hairs. Cool greenhouse. (B. M. 7126.)

A. geophilum (earth-loving). *fl.* purplish-brown, margined and spotted with white, solitary, very shortly pedunculate, about 1in. in diameter, scarcely appearing above the surface of the ground. December. *l.* cordate-orbicular, somewhat fleshy, 2in. to 4in. across, dark shining green veined with white on the upper surface. South China, 1888. Cool greenhouse. (B. M. 7168.)

A. Hookeri (Hooker's). The correct name of *A. caudatum.*

A. japonicum (Japanese). A synonym of *A. Thunbergii.*

A. leucodictyon (white-netted). A synonym of *A. albivenium.*

A. macranthum (large-flowered).* *fl.* of a rich purplish-brown, about 2in. in diameter, seated close to the ground, and so numerous that they cover the surface, the broad, much-undulated, spreading lobes of the perianth bordered with yellowish. *l.* 4in. to 5in. across, borne well above the flowers, on stout stalks, shining green above, mottled with white and paler beneath, with prominent red veins. Eastern China and Formosa, 1877. Greenhouse. This species has a pleasant odour, like Fenugreek. (B. M. 7022.)

A. maximum (largest). *fl.* maroon-purple, with a conspicuous eye-like blotch of white, fleshy, three-lobed, 2½in. in diameter, borne on short stalks. *l.* cordate, 1½ft. high, 8in. in diameter, dark green, mottled with grey much in the same manner as a Cyclamen. Rhizome creeping. China, 1895. (B. M. 7456.)

A. parviflorum (small-flowered). The correct name of *Heterotropa parviflora.*

A. Thunbergii (Thunberg's). The correct name of *Heterotropa asaroides.* SYN. *A. japonicum.*

ASCARICIDA. Included under **Vernonia** (which *see*).

ASCIDIUM (*pl.* Ascidia). A hollow, pitcher-like leaf, *e.g.*, that of *Sarracenia.*

ASCIUM. A synonym of **Norantea** (which *see*).

ASCLEPIAS. About sixty species are included in this genus, the majority being North American; a few are found in Central and South America, two in Africa, and one is broadly distributed over the warmer regions of the globe. To those described on pp. 119-20, Vol. I., the following varieties should be added:

A. acuminata is synonymous with *A. rubra.*

A. amœna is synonymous with *A. purpurascens.*

A. atrosanguinea aurea (blood-coloured and golden). This ornamental plant appears to be a variety of *A. curassavica* with deep blood-red flowers, having a yellow corona. Bolivia, 1883.

A. decumbens (decumbent). A variety of *A. tuberosa.*

A. incarnata pulchra (pretty). A form with copious and somewhat hirsute pubescence, and usually broader leaves (lanceolate to oblong), often sub-cordate at base. North America. (S. B. F. G. ser. ii., t. 18, under name of *A. pulchra.*)

A. pulchra (pretty). A form of *A. incarnata.*

A. speciosa (showy). The correct name of *A. Douglasii.*

A. syriaca. The correct name is *A. Cornuti.*

A. tuberosa decumbens (decumbent). *fl.* in umbels from most of the upper axils, racemosely disposed. *l.* broader and more commonly opposite than in the type. Stems reclining. North America, 1680. (S. B. F. G. ser. ii., t. 24, under name of *A. decumbens.*)

ASCOCHYTA. A genus of fungi belonging to the *Sphæropsideæ*, probably representing phases in the life cycle of ascigerous fungi. The chief outward characteristic of this genus is a spotting of the parts affected—leaves, stems, or, in the case of leguminous plants, the pods. The Garden Pea and the French Kidney Bean are both liable to attack from *A. pisi*, the spots appearing on leaves and pods. Generically the fungus may be briefly described: Conidia roundish, two-celled, hyaline; pycnidia embedded in the injured parts, which, in addition,

Ascochyta—*continued.*

are sometimes surrounded by rings. Other species infest the hardy *Aspidistra*, the Raspberry, the Strawberry, and the Petunia. Spraying with sulphide of potassium (½oz. to the gallon of water) is probably the best preventive.

ASCOMYCETES, or SAC FUNGI. A group of fungi characterised by the spores being produced in cylindrical sacs, scientifically known as asci. To this group belong the Mildew Fungi (*Erysipheæ*), the esculent Truffles (*Tuberaceæ*), and the *Pyrenomycetes*, several kinds of which destroy not only forest trees, but also Vines and fruit trees. Indeed, to the last-named order belong the genera responsible for the Anthracnose of the Vine, the Canker of Apple and other trees, and the ergot of economic value because of its medicinal properties. The last order of this group is *Discomycetes*, to which belong the genera causing the Blotch Disease of Maples, the peculiar Pocket, Mock, or Bladder Plums, the disfiguring and debilitating Peach-Curl, the Witches' Brooms of the Cherry, and many others less noteworthy.

ASCYRUM. Five species, found in North America and the Antilles, are referred to this genus.

ASEXUAL. Having no sex; *e.g.*, flowering plants that have neither stamens nor pistil.

ASH BARK SCALE (*Chionaspis fraxini*). Though commonly known by the name above adopted, this familiar insect almost as often frequents Willows, Alders, and other plants. The genus to which it belongs is a destructive one, and in certain seasons the active and conspicuous red larvæ may in late spring be found in myriads on tree-trunks which recently gave them birth. The larvæ form scale-like coverings, and then are inactive. They moult several times before arriving at the perfect stage. The females differ considerably from the males. First, they are inactive creatures destitute of wings; secondly, they are responsible for the damage to the trees by extracting the juices by means of their rostra, the males not being provided with a mouth. Usually, the males are winged, though they are seldom seen; but sometimes with this genus there are wingless males, whose functions are simply to perpetuate their kind and die. The females never move once the perfect insect stage is reached; indeed, they are absolutely incapable of so doing. They affix themselves to the spot on which the eggs are to be deposited, and there die, the shrivelled body combining with the covering elaborated to form a protection for the bright red eggs.

These insects appear in such vast numbers in certain seasons that they cause no little damage to the trees. Where, therefore, Ash or other trees, used in the decoration of gardens, are attacked by this Scale, they should be treated to kerosene emulsion during the latter part of May, by which time the larvæ have usually not begun to elaborate their protective covering, and are thus readily killed by contact.

ASH MIDGE. *See* **Diplosis.**

ASH, SOUTHERN PRICKLY. *See* **Xanthoxylum Clava-Herculis.**

ASILUS CRABRONIFORMIS. *See* **Hornet Fly.**

ASIMINA. SYN. *Orchidocarpum.* This genus embraces seven or eight species, all American. Leaves penniveined.

A. triloba is the Papaw or Custard Apple of the United States. SYN. *Anona triloba* (B. M. 5854).

ASPARAGUS. Bentham and Hooker include *Myrsiphyllum* hereunder, but it has been kept distinct in this work. The genus comprises nearly 100 species, broadly dispersed over the temperate and warmer regions. To those described on pp. 122-3, Vol. I., the following should be added. Except where otherwise stated, warm

Asparagus—*continued.*

greenhouse treatment is required. For further information, see the "Gardener's Chronicle," February 26th, March 12th and 26th, 1898.

In addition to the manures previously recommended for Asparagus, mention should now be made of kainit and nitrate of soda: 2oz. of the former and 1oz. of the latter should be mixed together and applied to each square surface yard of the beds. This dressing may be given two or three times during the growing season.

A. acutifolius (acute-leaved). *fl.* yellow, ¼in. across. *fr.* deep crimson, pea-like. *l.* grey-green, hair-like, rigid, tufted, becoming almost spinous in exposed situations. Stems hard, wiry, brown, about 5ft high; branches rigid, 3in. to 6in. long. South Europe, 1640. Hardy perennial. (S. F. G. 337.)

A. æthiopicus (African).* *fl.* white, in racemes 2in. to 3in. long. *fr.* globose, ¼in. in diameter, one-seeded. *l.* flat, falcate, rigid, bi- or ternate, ascending, mucronate, ¼in. long. Stems woody, terete, climbing, 10ft. long; branchlets short, strongly angled; prickles large, pungent. South and tropical Africa, 1816.

A. æ. natalensis (Natal). *fl.* loosely panicled. *l.* larger, less rigid, darker green.

A. æ. ternifolius (ternate-leaved). This is a synonym of *A. falcatus.* (G. C. 1893, xxiii., p. 123, f. 47.)

A. africanus (African). *fl.* white, small, star-shaped, generally produced in axillary umbels. *fr.* globose, ¼in. in diameter, one-seeded. *l.* densely clustered, rigid, subulate, about ¼in. long, persistent. Stems 12ft. long, woody, terete, much-branched, sarmentose; branchlets slightly zigzag; main prickles large, pungent. South Africa, 1819.

A. a. dependens (hanging down). *l.* shorter and stouter than in the type. Branches deflexed, often pubescent.

A. albanensis (Albanian). A variety of *A. plumosus.*

A. asiaticus (Asiatic). *fl.* white, few, axillary, small. *fr.* globose, ¼in. in diameter, one-seeded. *l.* subulate, rigid, ascending, ¼in. to ½in. long, three to twelve in a cluster. Main stem 30ft. long, slender, green, sarmentose; main prickles small; branches long. Asia and Africa, 1759. A vigorous climber, requiring a somewhat shaded position.

A. Buchanani (Buchanan's). *fl.* white, campanulate; racemes 1½in. to 2in. long, loose-flowered. *l.* ¾in. long, very narrow-linear, ascending, elongated. Branches slender, glabrous; spines hard, pungent, ¼in. long. Shiré Highlands, Tropical Africa, 1893. Plant shrubby, broadly sarmentose.

A. comorensis (Comoro).* This resembles *A. plumosus* in general appearance, but differs mainly in its more robust habit, darker green colour, and the soft texture of its leaves. Comoro, 1833. (G. C. 1893, xxiii., p. 131, f. 72.)

A. crispus (curled). The correct name of *A. decumbens.*

A. declinatus (declinate). *fl.* white, very small, campanulate. *fr.* small, globose, one-seeded. *l.* slender, subulate, bright green, ¼in. to ½in. long, six to ten in the lateral clusters, as many as twenty in those at the tips and bases of the branchlets; main leaves produced into a deltoid spur. Stems sarmentose, glabrous, woody, terete; branches decompound, with numerous spreading or deflexed branchlets. South Africa, 1759. Half-hardy.

A. deflexus (deflexed). *fl.* striped with brown, small, solitary or in clusters of two to six. October. *l.* ¼in. long, in clusters of six to ten; main ones forming a short, deflexed spur. Branches slender, the lower ones deflexed; branchlets very short. Angola, 1892. A hardy, much-branched shrub.

A. grandiflorus (large-flowered). A synonym of *A. umbellatus.*

A. laricinus (Larch-like). *fl.* white, small, campanulate, axillary, many in a cluster. May. *fr.* dull red, globose, one-seeded, ⅛in. in diameter. *l.* subulate, rigid, densely clustered, ascending ¾in. to 1½in. long, bright green. Stems 12ft. long, woody, much-branched; main prickles large, pungent, spreading; branches pale, ascending, zigzag. South Africa, 1816. (G. C. 1893, xxiii., p. 122, f. 46.)

A. lucidus (clear). *fl.* white, small, axillary. *fr.* pink, or white when ripe, ¼in. in diameter. *l.* narrow, flattened, falcate, 1in to 2in. long, disposed in fascicles of two to six. Stems thin, flexuous, 4ft. to 6ft. long, with small spines, branching freely. China and Japan. An elegant stove climber for pillars, &c.

A. medeoloides (Medeola-like). The correct name of *Myrsiphyllum asparagoides.*

A. plumosus (G. C. 1893, xxiii., p. 146, f. 58). SYN. *A. consanguineus.* The following are varieties:

A. p. albanensis (Albanian). *l.* longer and less numerous than in the type. 1895.

A. p. cristatus (crested). Branches less flattened, each terminating in a tassel-like cluster of branchlets and leaves.

A. p. declinatus (declinate). A variety with drooping branches.

A. p. Sanderi (Sander's). A curious seedling form, of tall habit, and having tufted, plumose growth on the large leaves. 1894.

Asparagus—*continued.*

A. p. tenuissimus (very slender).* This is of a lighter green than the typical *A. plumosus,* and the foliage is remarkable for its extreme slenderness and delicate appearance. South Africa, 1882.

A. retrofractus (bent back).* *fl.* white, small, axillary, umbellate. July. *fr.* small, globose, one-seeded. *l.* densely clustered, subulate, curved, ascending, ¼in. to 1in. long, bright green, Larch-like. Stems 6ft. or more in length, slender, woody, terete, much-branched; main prickles small, pungent, uncinate; branches slender, very zigzag. South Africa, 1759. SYN. *A. r. arborescus.*

A. sarmentosus (sarmentose). *fl.* white, star-like, fragrant; racemes 1in. to 3in. long, spreading from the woody branches. August. *fr.* bright scarlet, pea-like. *l.* linear, rigid, mucronate, ¼in. to ¾in. long, solitary except at the tips of the branchlets, flat, bright green, with a distinct midrib. Stems woody, sub-erect or twining, with short, deflexed prickles; branchlets numerous, square, spreading or ascending. South Africa, 1810. Cool house. (G. C. 1893, xxiii., p. 179, f. 71.)

A. scandens deflexus (deflexed). *fl.* smaller than in the type. *l.* firmer, ¼in. to ½in. long. Branchlets very zigzag.

A. schoberioides (Schoberia-like). *fl.* small, sessile, produced on the lower half of the branches. *fr.* red, small, abundant. *l.* in clusters of three or four, ¼in. long, linear, falcate, deciduous. Stems about 1ft. high, thin, wiry, branched above. Japan. Of this hardy but not very ornamental species there are one or two varieties, one having longer stems.

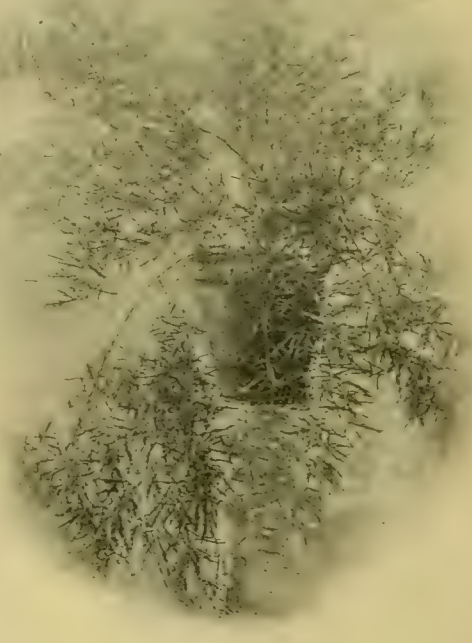


FIG. 82. ASPARAGUS SPRENGERI.

A. Sprengeri (Sprenger's).* *fl.* whitish, small, racemes 1in. long. *fr.* ⅛in. in diameter. *l.* flat, linear, glabrous, bright green, straight or slightly curved, 1in. to 1½in. long, ⅛in. broad, flattened, glossy green. Stems woody, terete, wide-climbing, 2ft. to 6ft. long, freely branched; prickles small, hooked. South Africa, 1890. A very elegant species. (R. G. 1890, p. 490, f. 80.) There is a variegated form. See Fig. 82.

A. tenuifolius (slender-leaved). *fl.* white, ¼in. across, axillary. May. *fr.* bright red, as large as Cherries. *l.* greyish-green, linear, curved, ½in. to 1in. long, in whorls of about a score at short intervals. Stems wiry, smooth, 3ft. high; branches ascending. France, Italy, &c., 1819. Half-hardy perennial.

A. tenuissimus (very slender). A variety of *A. plumosus.*

Asparagus—*continued.*

A. trichophyllus (hair-leaved). *fl.* axillary, usually solitary, on long pedicels. *fr.* pea-like. *l.* ¼in. to 1in. long, stiff, subulate, in clusters of twenty to thirty. Stems flexuous, 3ft. to 6ft. long, freely branched above; branches having curved-up spines at their base. Siberia and Northern China. Hardy perennial.

A. umbellatus (umbellate). *fl.* white, small, fragrant, in compact umbels of about a dozen. *fr.* pea-like. *l.* stiff, almost spinous, triquetrous, ¼in. long, in clusters of ten to twenty. Stems slender, striated, wiry, copiously branched above; branches drooping, thickly clothed with leaves. Canary Islands, 1823. A nearly hardy sub-shrub. SYN. *A. grandiflorus.*

A. verticillatus (whorled). *fl.* small. *fr.* bright red, like those of the common Asparagus. *l.* hair-like, ¼in. to 2in. long, in tufts of two to twenty. Stems ¼in. thick, woody with age, smooth, armed with short, hard spines at the nodes; branches numerous, slender, 1ft. to 2ft. long. Persia, Siberia, &c., 1752. Hardy.

ASPARAGUS BEETLE. This pest seems to be on the increase, and many cases are on record of entire failure of crops in certain districts owing to the prevalence of the Beetle. It has already been shown (Vol. I.) that the Beetle is sufficiently distinctive not to be passed over for any other. The larva, however, is not so readily recognised. It is of a bluish-grey colour, with black head and legs, and in length varies somewhat from ⅛in. or a little more to as much as ¼in. It feeds for some fourteen days, at the end of which time it assumes the pupal state beneath the soil. The Beetles deposit their eggs, which are frequently laid in rows, on the shoots and leaves of their food-plants, and though of comparatively small size they may readily be distinguished. The symptoms of attack of the Asparagus Beetle are a withering of the shoots, and instead of the plants presenting a light green appearance, patches of a brown or yellowish colour may be found upon them early in the season. Such plants, if examined, will almost invariably be found to harbour the larvæ of the Beetle under notice. These grubs, too, are difficult to dislodge, possessing as they do the power of holding on by means of the fleshy foot found at the anal extremity.

Besides the remedial measures suggested in Vol. I., it will be well to go over infested plants while the grubs are on the feed, and either squeeze them between finger and thumb, or remove them bodily and cast them into an insecticide previously prepared. Shoots, too, on which eggs have been deposited should be cut off and burned. It is useless removing such infested portions and then consigning them to the rubbish-heap.

ASPARAGUS RUST. *See* **Puccinia Asparagi.**

ASPASIA. The half-dozen species of this genus are all tropical American, ranging from Brazil as far as Central America. To those described on p. 124, Vol. I., the following should be added:

A. principissa (princely). *fl.* over 2in. across, somewhat resembling those of an Odontoglossum; segments light green, lined brown, lanceolate-linear; lip light buff, broadly pandurate, almost 1in. long, with two parallel tubercles at the base. Veraguas.

ASPERELLA (a diminutive of *asper*, rough; in allusion to the scabrous leaves). Also spelt *Asprella*. SYNS. *Gymnostichum*, *Hystrix*. ORD. *Gramineæ*. A monotypic genus. The species, *A. Hystrix*, is a rather tall, hardy, annual Grass, native of the Orient, with longer, looser, and slenderer terminal spikes than in *Elymus* (to which this genus is closely related), and flat leaves. It is largely used on the Continent in bouquets of everlastings, and for other purposes.

ASPERIFOLIÆ. Included under **Borragineæ** (which *see*).

ASPERULA. Of this genus about eighty species have been described; but not nearly that number are distinct as such. They extend over Europe, Asia (especially Western), and Australia.

A. azurea is the correct name of *A. orientalis.*

A. calabrica (Calabrian). A synonym of *Putoria calabrica.*

ASPHODEL, FALSE. *See* **Tofieldia.**

ASPHODEL, SCOTCH. *See* **Tofieldia palustris.**

ASPHODELINE. SYN. *Dorydium.* There are about fourteen species of this genus, natives of the Mediterranean region and the Orient as far as Persia and the Caucasus. To those described on pp. 124-5, Vol. I., the following should be added.

A. cretica (Cretan). A synonym of *A. tenuior.*

A. imperialis (imperial). *fl.* reddish-white, large. *fr.* angular. *l.* forming a magnificent rosette, somewhat prolonged up the stem, and not all springing from one base. Stem furnished with leaf-scales. *h.* 8ft. Thyana, Cappadocia, 1897. The largest of all the species. (G. C. 1897, xxii., p. 397, f. 116.)

ASPHODELOPSIS. A synonym of **Chlorophytum** (which *see*).

ASPHODELUS. The six or seven described species of this genus are reduced by Baker to five; they inhabit the Mediterranean region, one extending as far as India and the Mascarene Islands. To those described on p. 125, Vol. I., the following should be added. *See also* **Asphodeline.**

A. acaulis (stemless). *fl.* six to twenty in a lax corymb; perianth pale pink, 1in. to 1½in. long, funnel-shaped; peduncle very short or abortive. May. *l.* ten to twenty in a dense, radical rosette, linear, tapering to a point, 6in. to 12in. long, minutely pubescent. Algeria. (B. M. 7004.)

A. albus is a sub-species of *A. ramosus.*

A. comosus (tufted). *fl.*, perianth ⅝in. long, the segments white, with a green keel; panicle 1ft. long, with a dense, terminal raceme 2in. in diameter, and six or eight small side ones; peduncle stout, as long as the leaves. *l.*, radical ones ensiform, 1½ft. long, gradually tapering, acutely keeled at back. North-western Himalayas, 1837.

A. tenuifolius (slender-leaved). The correct name of *A. æstivus.*

ASPIDIOTUS. ORD. *Homoptera.* One of the numerous genera into which the scales are divided. It belongs to the group *Diaspina*, in which the scales are formed by the aid of the cast-skins and a kind of secretion. In this genus the scales are almost circular, while the exuviæ are central or lateral in the male, concealed, covered with a pellicle having a raised point in the centre. There is some little confusion existing with regard to the nomenclature of this genus, and the many synonyms which are from time to time employed add to the difficulty. Reference has already been made to the fact that *A. conchiformis* is no longer employed by naturalists for the Mussel Scale, but *Mytilaspis pomorum*, the former now being regarded as a useless synonym. The members of this genus are found on a variety of plants, both outdoors and under glass, and are most undesirable. The chief species found in gardens are referred to under **Scales** and **Pear Insects.**

ASPIDISTRA. SYNS. *Macrogyne* and *Porpax.* This genus embraces four species, natives of the Himalayas, China, and Japan. Leaves radical, long, ample, contracted into shortly-dilated petioles. To the species, &c., described on p. 125, Vol. I., the following should be added:

A. elatior (taller). The correct name of *A. lurida* (of gardens), described and figured in Vol. I.

A. punctata (B. R. 977) is synonymous with *A. clatior.*

A. typica (typical). *fl.* dirty white or greenish, speckled with red, dark purple within, numerous, radical, ¾in. in diameter, globose. September. *l.* 1ft. to 1½ft. long, long-petiolate, elliptic-lanceolate; nerves about seven. Rootstock stout, creeping. Tonkin (?), 1895. (B. M. 7434.)

ASPIDIUM. Buckler Fern. Including *Melanopteris* and *Phanerophlebia.* This cosmopolitan genus embraces about sixty species, showing remarkable variation as regards size, texture, cutting, and venation. To the information given on pp. 125-7, Vol. I., the following should be added. Several species formerly included here will now be found under **Nephrodium.**

Very few, if any, Aspidiums are fastidious in their habits. The exotic species found in the group *Polystichum* are particularly robust; and whether adapted to stove or to greenhouse treatment, all thrive in a mixture of three parts sandy peat and one part fibrous loam. They also succeed admirably in places where light is not

Aspidium—*continued.*

abundant, and where few other Ferns would hold their own.

The British portion of the group *Polystichum* is represented by the Prickly Shield Fern and its numerous varieties, all of which are free-growing, easily-managed, and very desirable for either the outdoor rockery, the indoor Fernery, or pot culture, as all are evergreen, delighting in a mixture of sandy loam and fibrous peat in equal parts, resting on a sound drainage. Although, when once established, the influence of strong light is not injurious to them, they produce much finer foliage when placed in a shady situation during the growing season. They require to be freely supplied with water at the roots: they must also be kept constantly moist during the winter. British Aspidiums are also excellent subjects for pot culture, as they bear indoor treatment much better than most native Ferns. Their propagation (except in cases of rare varieties, which are only increased by division of the crowns) is usually effected by means of spores; these are produced in great abundance, and if sown as they ripen, at the end of the summer, germinate rapidly, and make, during the following summer, young plants which are very valuable for the decoration of the greenhouse and of the conservatory during the ensuing winters.

The deservedly popular Ferns commonly known under the name of *Cyrtomium* are amongst the most useful of decorative plants, on account of their rapid growth and their firm, leathery texture, besides being all very distinct and particularly handsome. They are indeed the best Ferns to use in the least favoured places—in rooms and on staircases, where their fronds seem to defy draughts, smoke, and even gas, better than any other Ferns with which we are acquainted. Their bold and shining foliage forms a striking contrast to that of finer-cut species when planted out in the cool Fernery, under which treatment they develop into handsome specimens in an incredibly short time, and show themselves to great advantage. For that special purpose, Aspidiums of the *Cyrtomium* group are of the greatest value, as by the use of them additional charm may be given to the rockery not heated artificially, but simply protected by glass, where they, being of an evergreen nature, retain their beauty during the whole of the winter months.

The soil which suits Aspidiums best is a compost of about equal parts fibrous loam, peat, and silver-sand; but care must be taken that they are not potted hard, or, if planted out in the Fernery, that the soil round them is kept moderately loose. They require an abundant supply of water at the roots during the growing season, and frequent syringings overhead are beneficial during that time, but they should be watered sparingly during winter. The propagation of plants of this section, like that of most other Aspidiums, is best effected by means of spores, which are abundantly produced, and which germinate very freely if sown as soon as gathered.

Amongst Aspidiums the Holly Fern (*A. Lonchitis*) is somewhat capricious under cultivation, although when established it will thrive in the greenhouse and luxuriate for a time in stove temperature. The best mode of treatment, however, is that advocated by Mr. W. Reeve. He has grown it most successfully in the cool house, where it was constantly shaded and standing upon a cool, damp bottom. He employed a compost of sandy loam and peat in equal parts, with a liberal admixture of sharp sand. It may be cultivated upon the outdoor rockery, but great care is necessary, as it is a very shy plant to establish itself in dry, exposed situations. Mr. Reeve remarks that "a shady part of the rockery must be selected, where it can be kept constantly damp without ever being wet," and that it will not stand stagnant moisture; also that it must be planted firmly in the above-mentioned compost as early in the spring as possible, and that if a hand- or bell-glass can be kept over it for a short time it is all the better, as this will maintain the soil moist about it for some time without the application of much water, after which it should be gradually inured to more air. It is usually increased by means of its spores, which should be sown as soon as ripe, for the division of its crowns, when several are produced, is at all times, and even under the most favourable conditions, considered a very risky operation.

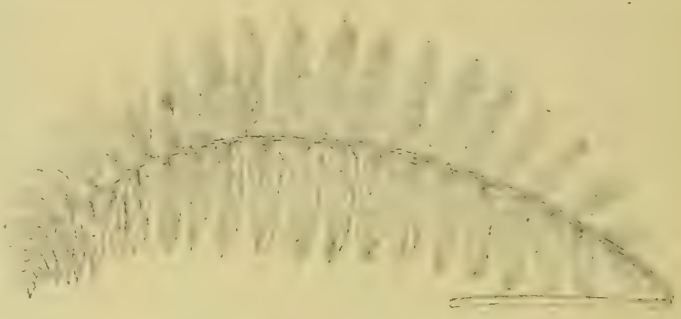


FIG. 83. FROND OF ASPIDIUM ACROSTICHOIDES.

Though perfectly hardy in most parts of this country, *A. acrostichoides* proves most useful when grown all the year round in either the cold house or the conservatory. Its handsome fronds, being of good substance, are very useful for cutting, and are admirably adapted for mixing with flowers. It is a species which thrives best in sandy peat and leaf-mould, with an abundance of water at the roots all the year round.

A. acrostichoides.* Christmas Fern. In North America the fronds (see Fig. 83) of this species are largely used for Christmas decoration.

A. aculeatum acrocladon (branched at apex).* *fronds* 1½ft. long, rich green, narrow, the pinnæ in the lower portion again divided to the midrib; apex of the fronds three-branched and repeatedly forked. An exquisite variety.

A. a. lobatum (lobed). A striking variety, chiefly distinguished from the type in its much shorter, more crowded, and less scaly pinnæ; the pinnules are also more nearly entire.

A. a. pulcherrimum (very pretty). *fronds* uncrested and quite barren; pinnules elongated and curved sickle-fashion, imparting a peculiar beauty to the frond.

Other more or less rare varieties are: *argutum, crassum, cristato-gracile, cristatum, densum, furcatum, interruptum, Moritzianum, multifidum, plumosum, pulchrum, setosum*, and *tsussimense*.

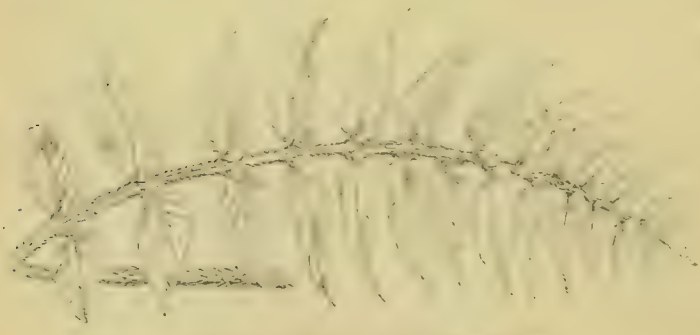


FIG. 84. FROND OF ASPIDIUM FALCATUM.

Aspidium—*continued.*

FIG. 85. ASPIDIUM FALCATUM PENDULUM.

A. angulare acrocladon (branched at apex). *fronds* about 10in. long, repeatedly branched at their extremity; rachis and under-side of the pinnules covered with light brown scales.

A. a. brachiatum (branched). *fronds* 1ft. to 2ft. long, pyramidal in form, the lowest pair of pinnæ being sometimes so large as to look like branches. The form *brachiato-cristatum* is a nearly allied form in which the end of each branch of the fronds terminates in a tuft.

Other varieties are: *acutilobum, acutum, alatum, aristatum, biserratum, cornutum, cristatum, Elworthii, Footii, grandidens, indivisum, interruptum, latipes, oxyphyllum, Padleyanum, præmorsum, pumilum, ramosissimum, setaceum, tripinnatum, truncatum,* and *varians.*

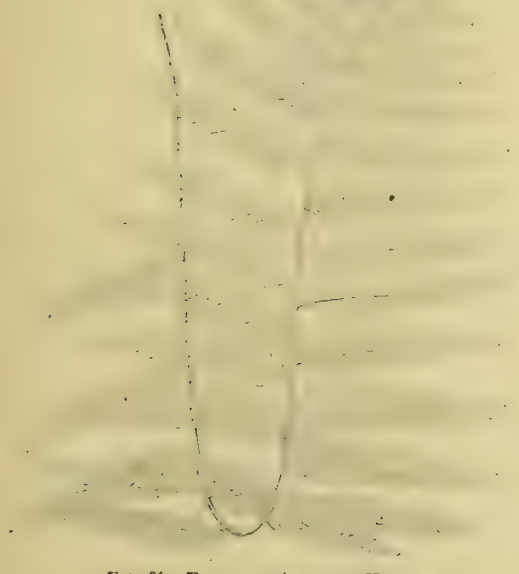


FIG. 86. FROND OF ASPIDIUM HOOKERI.

Aspidium—*continued.*

A. atratum (dark). A synonym of *Nephrodium hirtipes.*

A. Blumei (Blume's). A synonym of *Nephrodium intermedium.*

A. caryotideum (Caryota-like). A variety of *A. falcatum.*

A. concavum (concave). A synonym of *A. laserpitiifolium.*

A. coniifolium (Conium-leaved). A synonym of *A. aristatum.*

A. Fadyeni (Fadyen's). A synonym of *Fadyenia prolifera.*

A. falcatum. The bold fronds (see Fig. 84) of this species and its varieties make a striking contrast with those of the more finely-cut species when planted out in the cold Fernery.

A. f. Fensoni (Fenson's). *fronds* having pinnules broader than in the typical plant, and coalescing near the tips of the fronds. 1889. A robust form.

A. f. pendulum (pendulous). This differs from the type in its pendulous habit and in having narrower pinnæ. 1892. See Fig. 85.

A. Fortunei (Fortune's). A form of *A. falcatum.*

A. Hookeri (Hooker's). This evergreen species (a frond of which is shown in Fig. 86) has quite the habit of a Nephrodium, and is of similarly soft texture.

A. lobatum (lobed). A variety of *A. aculeatum.*

A. mucronatum. In habit, texture, and colour, this lovely dwarf, evergreen, easily-cultivated species somewhat resembles our native Holly Fern (*A. Lonchitis*). See Fig. 87.

FIG. 87. ASPIDIUM MUCRONATUM.

A. munitum.* This very handsome species, when well grown and fully developed, is one of the finest Ferns native of North America, where it is popularly known as Chamisso's Shield Fern. See Fig. 83.

A. Plumieri (Plumier's). A form of *A. trifoliatum.*

A. polyblepharum (many-fringed). A synonym of *A. angulare.*

A. proliferum (proliferous). A name applied to forms of *A. aculeatum* and *A. angulare.*

A. Richardi (Richard's). *sti.* stout, erect, 6in. to 12in. long, scaly throughout. *fronds* coriaceous, 9in. to 18in. long, 6in. to 9in. broad. *sori* in two rows midway between midrib and edge. New Zealand. This greenhouse species differs from *A. aculeatum* in its more rigid texture and shorter teeth, and in its lower pinnæ being of the same size as those in the centre of the frond. SYN. *Polystichum Richardi.*

Aspidium—*continued.*

FIG. 88. ASPIDIUM MUNITUM.

A. setosum (bristly).* *sti.* stiff, 8in. to 10in. long, very scaly. *fronds* evergreen, dark, 1½ft. to 1½ft. long, 4in. to 6in. broad; pinnæ densely placed; pinnules somewhat cordate, but terminating in a bristle, and so closely set as to overlap. *sori* scattered over the whole under-surface of the frond. Japan. A very popular and decorative, greenhouse or nearly hardy Fern. See Fig. 89. SYN. *Polystichum setosum.*

A. simulatum (simulating). A synonym of *Nephrodium simulatum.*

A. Standishii (Standish's). A synonym of *A. lasercpitiifolium.*

A. triangulare laxum (triangular, loose). *fronds* long and very narrow, somewhat drooping, of a leathery texture, and very lasting. A garden variety. SYN. *Polystichum xiphioides.*

A. triangulum ilicifolium (Holly-leaved). *sti.* slender, 1in. to 2in. long, clothed with large, light brown scales. *fronds* 6in.

FIG. 89. ASPIDIUM SETOSUM

Aspidium—*continued.*

to 9in. long, 1in. to 2in. broad; pinnæ about 1in. long, mucronate at apex, cut down below to the rachis into lanceolate lobes. *sori* principally in two rows near the midrib. Northern India. Greenhouse. See Fig. 90.

A. trifoliatum Plumieri (Plumier's). A large form, with more copious and more scattered sori, and a less distinctly peltate involucre than in the type.

A. tripteron. A frond of this characteristic species, which is almost hardy, but thrives in a greenhouse, is shown in Fig. 91.

A. truncatulum (slightly truncate). A synonym of *Didymochlæna lunulata.*

A. uliginosum (marsh-loving). A synonym of *Nephrodium cristatum uliginosum.*

A. vestitum (clothed). A variety of *A. aculeatum.*

ASPLENIUM. Including *Callipteris*, *Lötzea*, *Oxygonium*, *Thamnopteris*, and *Triblemma*. Nearly 350 species of this genus have been recorded, including plants from all parts of the world where Ferns grow.

Asplenium forms a most interesting genus among the Ferns of British origin, and are particularly useful on account of the evergreen nature of their fronds. The leathery texture of their foliage also greatly adds to their value as decorative plants; while the ease with which the strongest-growing kinds may be cultivated also tends to make these species particularly popular.

FIG. 90. ASPIDIUM TRIANGULUM ILICIFOLIUM.

Some of the very dwarf-growing sorts are somewhat difficult to preserve, especially in smoky localities, but these, besides succeeding fairly well in Fern-cases, are rendered specially attractive through their constitution and mode of growth, and they may safely be termed the gems among our native Ferns.

Most Aspleniums succeed best in a mixture of fibrous loam, peat, and sand, in equal proportions. In potting them, great care should be taken with the drainage, as, if it is at all defective the plants will soon become

Asplenium—*continued.*

flabby and otherwise begin to show symptoms of ill-health. With the exception of a few dwarf species, which grow naturally in walls or in fissures of rocks, Aspleniums, above all, dislike being potted hard. Many of them will stand the full rays of the sun under glass, but it is not beneficial in any way to the plants, which, instead of being of a healthy, bright, shining green colour, as nearly all of them are when in good condition, have a yellowish tint, although they may perhaps be hardier than those grown in partial shade.

Being native of countries very distant from one another, and being found wild under totally different conditions, it will be easily understood that Aspleniums require varied treatment, and, on that account, while some kinds really need stove temperature to develop their foliage to perfection, others do well in a greenhouse temperature, while a few of them may even be used with advantage for the ornamentation of the hardy Fernery. Although the majority of the hardier kinds—even our own *A. marinum*—grow very well for a time under the influence of strong artificial heat, it must be borne in mind that they are much more robust, although of slower growth, when kept in a lower temperature.

FIG. 91. FROND OF ASPIDIUM TRIPTERON.

A considerable number of exotic Aspleniums are either viviparous or at least proliferous at their apex. In either case if there is a desire to increase the stock of any particular viviparous or proliferous species, the portion of the fronds bearing the rudiments of young plants should be pegged down to the soil, and be kept moderately moist, when they will soon root.

When Aspleniums have to be produced in large quantities—such, for instance, as the kinds belonging to the *bulbiferum* group, which for decorative purposes are raised by the thousand—market growers find it more expeditious to detach the little bulbils when furnished with two or three tiny fronds, and to prick them in close together in shallow boxes filled with a loose compost of three parts peat or leaf-mould, one of loam, and one of sand: in this they produce roots very freely, and rapidly form young plants, which may be potted singly as soon as they have from six to eight fronds. None of the British Aspleniums are known to possess these viviparous or proliferous characters, and their propagation is usually effected by division of their crowns, although they may with advantage be increased from spores, which mostly ripen in the autumn and germinate freely during the following spring.

The genus *Asplenium* is unusually rich in decorative species and varieties, and comparatively few require special treatment. *A. Fabianum* is, however, one that

Asplenium—*continued.*

does. It succeeds when grown in peat and sand alone, and will be found to produce fronds of large dimensions, and especially bright as to colour. The Fern is admirably adapted for table-decoration, for vases, &c. It is perfectly evergreen, and very good-sized plants with a quantity of foliage may be grown in pots of comparatively small size.

Very decorative, too, is *A. caudatum*, an easily-grown Fern, requiring a mixture of peat and sand only. On account of the gracefully pendulous character of its fronds, this species is very well adapted for growing in hanging-baskets of large dimensions. The whole plant is of a beautiful dark, glossy green, which contrasts agreeably with the colour of the conspicuous fructification. The fronds, being of leathery texture, remain a long time on the plant. *A. formosum* is another species which must be grown in peat and sand, with the addition of a little crock-dust. Loam it does not like.

Noteworthy in connection with this genus is the fact that it contains several of our finest native Ferns, though unfortunately these are not as readily accommodated as are some of the exotics. One of the prettiest and most interesting of all such Ferns is *A. Ceterach*. It is not at all easy to cultivate successfully; it is too impatient of confinement to live long in a greenhouse, and the cold frame, so useful for the protection of other half-hardy species, is almost certain death to this. So wrote an experienced cultivator, Mr. Charles Johnson, more than a quarter of a century since. Further, he said that it universally seemed to prefer a calcareous habitat; and those who have seen it in a state of Nature can testify to that fact. Other points to be observed in its cultivation are ample drainage, whether in the open or in pots, and in the latter case it is, moreover, necessary to avoid wetting the fronds when watering.

Another native gem is the Black Maidenhair Spleenwort (*A. nigrum*), which, on account of the lasting qualities of its foliage, has taken a prominent position. Its dark, shining fronds, when cut and mixed with flowers, retain their freshness for an almost unlimited time; they are of elegant outline, and are produced in great abundance. It is found very plentifully in Cornwall, Devonshire, Somerset, Hampshire, and in some other counties, in shady places at the foot of trees and shrubs, as also along the hedges, in meadows, on old walls, and in disused quarries. These are the positions in which the fronds attain their greatest size, but the Fern will also bear continued exposure to sunshine, and when growing thus it is very dwarf and of a yellowish colour. It is also very useful for pot culture, as it thrives under glass in the cool house, even better than it does in the outdoor Fernery. The best soil for this Fern is a mixture of leaf-mould, sandy loam, lime rubbish, and fibrous peat in about equal parts. Propagation may be effected by means of spores, which are ripe about September; or by the divisions of the crowns during March and April.

Distinct and beautiful again is another native—the Lady Fern, one of the easiest grown and most decorative of all British Ferns. Mr. S. Moore thus writes of its requirements in "British Ferns": When placed about rockwork it should occupy a low, boggy situation at the base of the rock, being planted amongst turfy soil, kept thoroughly moistened, either naturally or artificially. It is far less beautiful if planted in dry, exposed situations. Few hardy plants which can be introduced among rockwork are so thoroughly lovely as a vigorous Lady Fern, placed just within the mouth of a cavernous recess large enough to admit of its development and just open enough that the light of day may gleam across the dark background sufficient to reveal the drooping, feathery fronds; and, what is more, it will delight to grow in such a situation

Asplenium—*continued.*

if freely supplied with moisture to its roots. In woodland walks, or on the shady margin of ornamental water, no Fern can be more appropriately introduced. When grown in a pot, it requires one of rather a large size, and should be planted in turfy soil intermixed with fragments of charcoal, sandstone, and potsherds. To attain anything like a fair degree of its ladylike gracefulness, this Fern must under all circumstances be well supplied with water.

Although really a British Fern, the Sea Spleenwort (*A. marinum*) does not not succeed well in the open in many parts of Great Britain; whereas it certainly luxuriates in warmth, and readily adapts itself to the treatment allowed even to our stove plants, it grows very well and forms splendid specimens in the cool and intermediate houses, pits, vineries, &c. It also proves one of the handsomest Ferns in cultivation when planted in the temperate Fernery. In its natural state the Sea Spleenwort appears to require very little nourishment for its maintenance, but when cultivated its young seedlings will often make their appearance and, if left undisturbed, grow luxuriantly in places where scarcely a particle of soil is to be found. It is, however, more satisfactory to plant it in a compost of three parts fibrous peat and one of sand, with thorough drainage.

Mention might now fittingly be made to the cultural requirements of the well-known Maidenhair Spleenwort (*Asplenium Trichomanes*), found almost everywhere in Britain. Hardy as the Fern is it prefers an exposed situation to a close or very shady one, in which the constant moisture, by collecting on the fronds, soon causes them to blacken and decay. If the plants are grown in pots, it is essential that these should be well drained, and frequent watering over the fronds must be avoided. The compost best suited for this species is a mixture of porous, loamy soil, lumps of sandstone, and old lime rubbish. In the hardy outdoor Fernery, *A. Trichomanes* is particularly adapted for the formation of a neat and pleasant edging where it can take its natural position; but in this case it should be planted between stones, and the crowns should be kept slightly above the surface of the soil. In such a position its graceful, slender fronds are shown to perfection. Propagated either by means of spores, which are generally ripe in August and germinate freely, or by the division of its crowns in March.

Two species which may be regarded as indispensable to any good collection of Ferns are *A. flabellifolium* and *A. flaccidum*. The former is best when grown in small hanging-baskets, as then its fronds are very graceful. In rustic cork baskets it is grown with most complete success, for it takes possession of the most ragged parts of them in a remarkably short time. Grown in pots or even trailing on the ground in a Fern-case, it has a weedy appearance. *A. fontanum* is another decided acquisition, as, on account of its dwarf, compact habit, it must be treated as an ordinary greenhouse Fern, have glass protection all the year round, and be shaded from the direct rays of the sun during the summer months. It is readily propagated by careful division of the plants during the spring months, when the portions thus obtained should be potted or planted in a mixture of sandy peat and broken bricks, or old mortar, or both; and particular attention should be paid to the drainage, which is best formed of freshly-broken bricks.

Greenhouse treatment should also be meted out to *A. lanceolatum*, another native Fern, though very local in its distribution. Like most of its congeners of small dimensions, it must be shaded from the hot sun. Under such treatment, and provided it be kept moderately moist, its fronds attain a length of from 10in. to 12in., and are of a beautiful dark green. A mixture of peat, lime-rubbish, bricks broken small, and leaf-mould, in about equal proportions, is what it likes. In planting or potting, the crown requires to be kept well above the surface of the soil. Usually propagated by division of the crowns in early spring, but the operation requires rather more attention than it is usual to bestow on British Ferns.

A. Goringianum pictum is another Fern which, though hardy in sheltered spots, is best grown in a greenhouse or under the shelter of a cold frame, using a compost of two parts of leaf-mould, one of fibrous loam, and one of silver-sand. Spores are produced in abundance, but the plant is propagated by division.

Although requiring stove heat to grow and develop their handsome fronds properly during the greater part of the year, *A. Nidus* and its varieties stand well out of doors in the summer if not exposed to the full sun, and they prove exceedingly effective when used in the subtropical garden. Great care must be taken to keep away slugs and woodlice, which are particularly fond of the young succulent fronds. These Ferns thrive best in a mixture of about equal parts rough, fibrous peat and chopped sphagnum. They require very little soil, most of the nourishment being derived from aërial roots, which are produced freely on the surface of the pot, and at the base of the fronds, if the atmosphere be kept in proper condition.

In *A. Selosii* and *A. septentrionale* we have two species somewhat difficult to manage. The former should be firmly potted between pieces of sandstone in loam, leaf-mould, rock-chippings, and sand, with good drainage. With the latter, as with all other species of delicate constitution and slow growth, it is necessary that the tufted crowns should be kept above the surface of the soil, and in potting it the essential point is to secure perfect drainage. A mixture of peat, loam, and old mortar, in about equal parts, should be used. Water must be sparingly given, taking care to avoid any superfluous moisture. The cold frame is the best place in which to keep the plant in good order.

It is worthy of special note that all Aspleniums are particularly free from the attacks of such pests as Thrips, Green-fly, and Mealy Bug, and are naturally clean plants, their worst enemies being Woodlice and Slugs, which are fond of their succulent stalks. The former must be trapped by means of slices of Carrot placed in their haunts, and the latter with bran or brewer's grains.

To the species and varieties described on pp. 127-35, Vol. I., the following should be added:

A. achilleæfolium (Achillea-leaved). *fronds* about 2ft. long, including the grey stipes, somewhat lanceolate; pinnæ numerous, soft, 4in. to 6in. long, 1in. broad, cut throughout to the winged midrib into numerous bluntly-toothed pinnules ¼in. long and ⅛in. broad. *sori* oblong, usually

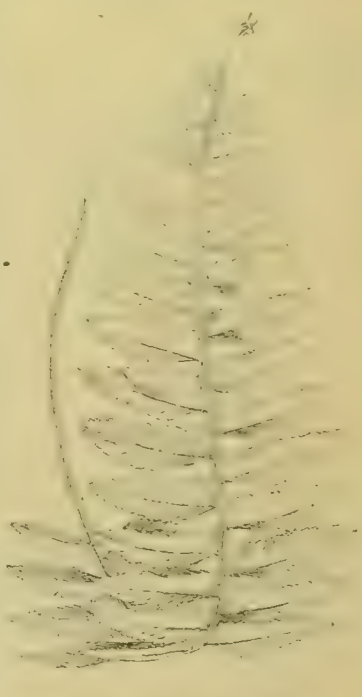


FIG. 92. FROND OF ASPLENIUM ALATUM.

Asplenium—*continued.*

one to each lobe of the pinnules. Mexico. Greenhouse. SYN. *Athyrium achilleæfolium.*

A. alatum. This species is readily distinguished by the broad and nearly transparent wings on the stipes and rachis. See Fig. 92.

A. amboinense (Amboyna). *rhiz.* creeping, clothed with black, subulate scales. *sti.* about 1in. long. *fronds* numerous, evergreen, lanceolate, narrowed below, truncate at apex, having a scaly bud at the end of the midrib, and a small, forked or multifid continuation of the frond. South Sea Islands, 1887. Stove.

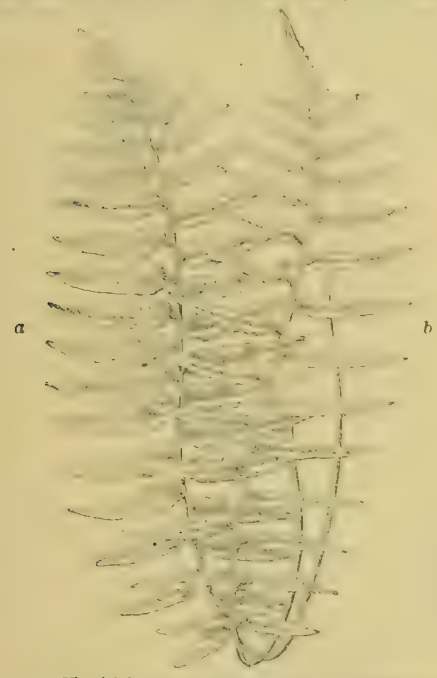


FIG. 93. (*a*) BARREN AND (*b*) FERTILE FRONDS OF ASPLENIUM ANGUSTIFOLIUM.

A. angustifolium. In damp, rich woods, especially in mountainous districts, this species is found in perfection. A barren and a fertile frond are shown in Fig. 93.

FIG. 94. ASPLENIUM ATTENUATUM.

Asplenium—*continued.*

A. attenuatum. The proliferous character of this singular, dwarf, rigid Fern, native of New South Wales and Queensland, is well shown in Fig. 94.

FIG. 95. ASPLENIUM BELANGERI.

A. auritum. The form *macilentum* has the rachis broadly winged and the pinnæ blunt; and *rigidum* has the pinnæ deeply pinnatifid throughout.

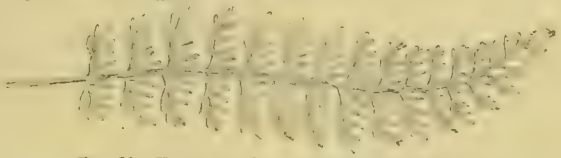


FIG. 96. FROND OF ASPLENIUM BRACHYPTERON.

A. axillare (axillary), of Aiton. A synonym of *A. umbrosum.*

A. bantamense (Bantam). *sti.* 6in. to 12in. long, firm, erect, nearly naked. *fronds* 9in. to 18in. long, with a large terminal

FIG 97. PARTIALLY-DEVELOPED BARREN FROND OF ASPLENIUM CAUDATUM.

Asplenium—*continued.*

pinna and one to four pairs of lateral ones, which are 6in. to 8in. long, 1¼in. to 2in. broad, narrowed at both ends, and with edges nearly entire. *sori* slender, irregular, nearly touching both edge and midrib. Himalayas, Hong Kong, &c. Greenhouse. SYNS. *A. fraxinifolium, Diplazium bantamense.*

A. Baptistii Drucryi (Druery's). A variety with broader pinnæ than in the type, and conspicuously crested. 1894.

A. barbadense (Barbados). *rhiz.* small, erect. *fronds* pinnate, densely tufted, erect, spreading, nearly or quite stalkless, pale green, 2in. to 4in. long, ¼in. to ⅜in. broad, tapering both ways; pinnæ spreading, numerous, sessile, oblong, the lower margin obliquely cut away, the rest crenate-toothed. Barbados, 1894. A pretty little stove species.

A. Beddomei (Beddome's). A synonym of *A. crinicaule.*

A. Belangeri. This handsome and deservedly popular species is one of the most elegant plants of the genus, forming a graceful plume of finely-divided fronds, spreading on all sides. See Fig. 95.

A. biforme (of two forms). A garden synonym of *A. dimorphum.*

A. brachypteron. Although introduced many years ago, this interesting species (a frond of which is shown in Fig. 96) is not so widely grown as it deserves. It should not be kept too warm. The warm end of a greenhouse, or the cool end of a stove, suits it best.

A. Bradleyi (Bradley's). *sti.* 2in. to 3in. long, polished, nearly black. *fronds* abundant, variable, usually pinnate, but in fully-developed specimens often pinnatifid and even bipinnate, 5in. to 7in. long, oblong-lanceolate; pinnæ eight to twelve pairs, the lower ones largest, all short-stalked and toothed. *sori* short, sub-costular. North America. Greenhouse.

A. Campbelli (Campbell's). *rhiz.* small, erect, with a few pale brown scales in the centre. *sti.* tufted, erect, rather strong, 4in. to 6in. long. *fronds* erect, composed of one or two pairs of contiguous, spreading lateral pinnæ, and a slightly larger terminal one, which are lanceolate, acuminate, 3in. to 5in. long, 1¼in. broad, shortly decurrent on the rachis. British and Dutch Guiana, 1885. Stove.

A. caryotæfolium (Caryota-leaved). A synonym of *A. cuneatum.*

A. caudatum. The frond illustrated at Fig. 97 is only partially developed, and does not show the tail-like appendage to which this plant owes its specific name.

A. celtidifolium (Celtis-leaved). *sti.* strong, erect, 1ft. or more in length, brownish, paleaceous below. *fronds* 2ft. to 4ft. long; 9in. to 18in. broad, pinnatifid at apex, pinnate below; pinnæ numerous, the lower ones distinctly stalked, 6in. to 9in. long, 1½in. to 2in. broad, acuminate, sub-entire or slightly toothed or lobed. *sori* beginning at the midrib and falling short of the edge. Cuba, Brazil, &c. Stove. SYN. *Diplazium celtidifolium.*

A. Ceterach ramoso-cristatum (branch-crested). *fronds* 8in. or more in length including the stipes, branching, and much divided at their extremity and occasionally crested as well; pinnæ variable in size and form, divided nearly or quite to the midrib. Ireland. An extraordinary form.

FIG. 98. ASPLENIUM COLENSOI.

A. Colensoi. When fully developed, the fronds of this elegant species are literally studded all over with young plants, by which means it may be readily propagated. See Fig. 98.

A. compressum. This thick, fleshy-looking Fern is different in appearance from any other known Asplenium (a frond and a detached pinna are shown in Fig. 99). It is known in Continental gardens as *A. fœcundum.*

A. conchatum (shell-like). *sti.* stout, erect, 2ft. or more in length. *fronds* 3ft. to 4ft. long, 1ft. to 1½ft. broad; lower pinnæ lanceolate, 9in. to 12in. long, 2in. to 3in. broad; pinnules numerous, lanceolate, cut down to a winged rachis into linear-oblong, spreading segments. *sori* short, oblong, in two oblique rows near the midrib. West Indies. Stove. SYN. *Athyrium conchatum.*

A. cordifolium (cordate-fronded). *sti.* firm, erect, 6in. to 12in. long, scaly below. *fronds* coriaceous, of an extraordinary shape,

Asplenium—*continued.*

being entire, cordate at base, and long-acuminate at apex. *sori* extending from the midrib to the edge. Philippine and Malay Islands. Stove. SYN. *Anisogonium cordifolium.*

FIG. 99. FROND AND PINNA OF ASPLENIUM COMPRESSUM.

A. costale (costal). *sti.* 1ft. or more in length, tufted, stout, erect. *fronds* large, the apex pinnatifid, the lower part copiously pinnate; pinnæ often 1ft. long, 3in. broad, cut down half or

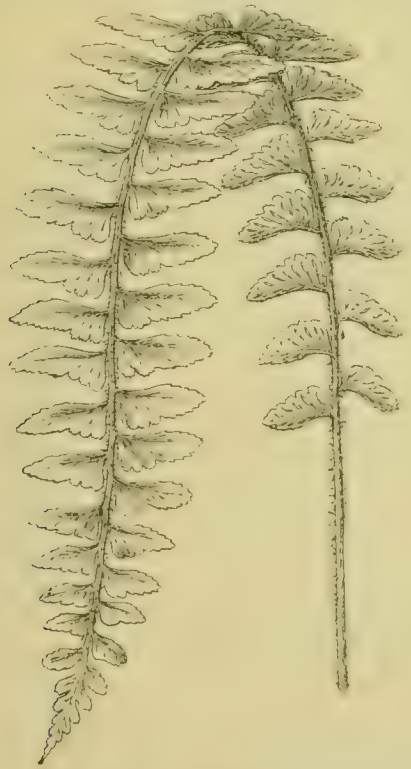


FIG. 100. FROND OF ASPLENIUM CRINICAULE.

Asplenium—*continued.*

two-thirds of the way to the rachis into blunt, slightly incised-serrated lobes. *sori* copious, broad, falling very short of the edge. West Indies to Peru. Stove. SYN. *Diplazium costale.*

A. crenulatum (slightly crenate). *cau.* erect. *sti.* firm, erect, 1in. to 1½in. long, hardly scaly below. *fronds* 2ft. to 3ft. long, 9in. to 15in. broad, pinnatifid at apex; pinnæ 6in. to 8in. long, 1¼in. broad, cut half or two-thirds of the way to the rachis into slightly-toothed, oblong lobes or segments. *sori* about ¼in. long, disposed close to the midvein of the fertile segments. Tropical America. A strong-growing, stove species, of nearly arborescent habit. SYN. *Diplazium crenulatum.*

FIG. 101. FROND OF ASPLENIUM DECUSSATUM.

A. crinicaule (hairy-stalked). *sti.* erect, 3in. to 4in. long, sparsely covered with dark brown hairs. *fronds* 6in. to 9in. long, 1½in. broad; pinnæ fifteen or more on each side, horizontal, subcoriaceous, obtuse, irregularly crenate on the edges, the upper side suddenly narrowed and sometimes auricled at base, the lower obliquely truncate. China, Sikkim, &c. Stove. See Fig. 100. SYN. *A. Beddomei.*

A. decurrens (decurrent). *sti.* short, grey, naked. *fronds* 1¼ft. to 1½ft. long, oblong-lanceolate; pinnæ five or six pairs, firm, parchment-like, dark green, proliferous at their extremity, adnate at their lower base, nearly or quite free and rounded on the

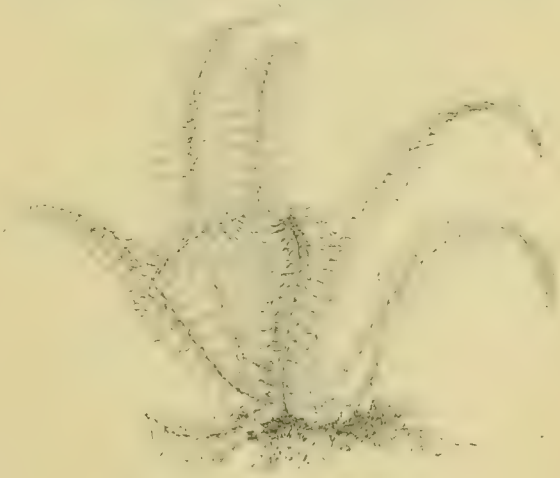


FIG. 102 ASPLENIUM EBENEUM.

Asplenium—*continued.*

FIG. 103. ASPLENIUM FERULACEUM.

upper side, crenulate above. *sori* in two parallel rows close to the midvein or rarely prolonged on either side of it. Samoa and Ceylon.

A. decussatum. A frond of this gigantic species is shown in Fig. 101.

FIG. 104. FROND OF ASPLENIUM FILIX-FŒMINA ACROCLADON.

Asplenium—*continued.*

A. dilatatum (stretched out). A synonym of *A. latifolium.*

A. divaricatum (divaricate). *sti.* very short. *fronds* 6in. long, 2in. broad; pinnæ numerous, closely set, almost overlapping, cut into numerous pinnules of a parchment-like texture not more than one line broad. *sori* solitary at the base of each pinnule. Chili and Peru. Stove.

FIG. 105. FROND OF ASPLENIUM FILIX-FŒMINA DISSECTUM.

A. Drueryi (Druery's). A form of *A. Baptistii.*

A. duale (double). *rhiz.* woody. *fronds* pinnate, 1½ft. long; pinnæ 1in. broad, serrated. *sori* linear, in two rows. Jamaica, 1893. A stove species, resembling *A. falcatum.*

A. ebeneum. The general appearance of this species, as will be gathered from Fig. 102, is that of an elongated form of *A. Trichomanes.*

A. elegantulum (rather elegant). A synonym of *A. incisum.*

A. elongatum (lengthened). A form of *A. tenerum.*

A. esculentum. The variety *serampurense* is a pubescent, simply-pinnate form.

A. ferulaceum (Ferula-like). *cau.* short, erect. *sti.* erect, naked, pale green, 6in. to 12in. long. *fronds* dark green, 1ft. to 2ft. long, somewhat ovate; pinnæ decreasing gradually upwards, the lowest horizontal or even deflexed, 6in. to 9in. long, 3in. to 5in. broad; pinnules subdivided into linear, flattened segments, which are again pinnatifid, the ultimate lobes being reduced to filiform organs ¼in. long. *sori* very small, lateral, abundant. Andes of Ecuador. This beautiful stove species is the most finely divided of the whole genus. See Fig. 103. SYN. *Darea ferulacea.*

A. Filix-fœmina acrocladon, a frond of which is shown in Fig. 104, is perhaps the most remarkably-crested form of the Lady Fern. Among other varieties the following call for mention:

A. F.-f. clarissima (very distinct). *fronds* 2ft. long, 1ft. broad, arching, very light green, and as finely divided as those of *plumosum.* Up to now this variety

FIG. 106. UPPER PORTION OF FROND OF ASPLENIUM FILIX-FŒMINA FIELDLÆ, with lower Portion showing arrangement of Pinnæ.

Asplenium—*continued.*

has failed to produce spores, and can only be propagated by embedding the edges of its pinnæ in light soil.

FIG. 107. FROND OF ASPLENIUM FILIX-FŒMINA GRANDICEPS.

A. F.-f. dissectum. The stipes and rachis of this variety are furnished with brown scales, which are so conspicuous as to impart the appearance of prickly processes. See Fig. 105.

FIG. 108. FROND OF ASPLENIUM FILIX-FŒMINA INCISUM.

A. F.-f. Fieldiæ (Miss Field's). *sti.* about 6in. long. *fronds* 2ft. or more in length, only 1in. broad, except just below the apex,

Asplenium—*continued.*

where they are 1½in. broad; pinnæ divided at base into two short pinnules, one part ascending, and the other descending, giving the fronds a cruciform appearance; near the apex the pinnæ merge into alternate pairs of gradually-diminishing, deeply-cut divisions, and the fronds terminate in a narrow, normal, truncate extremity. A remarkable form. See Fig. 106.

A. F.-f. Friselliæ coronare (crowned). A handsome variety, with short and much divided fronds. 1894.

A. F.-f. Girdlestonei cristatum (Girdlestone's crested). *fronds* of a pleasing green; pinnæ densely tufted. 1891. A slender, graceful form.

FIG. 109. FROND OF ASPLENIUM FILIX-FŒMINA VICTORIÆ.

A. F.-f. grandiceps. The weight of the dense, globose crest (Fig. 107) of this variety causes the fronds to assume a pretty arched appearance.

A. F.-f. incisum (cut). *fronds* gigantic, attaining 4ft. to 5ft. in length and 1ft. in breadth, broadly lanceolate, drooping; pinnæ tapering; pinnules often so deeply cut as to render the fronds almost tripinnate. See Fig. 108

A. F.-f. plumosum Dreweryi (Drewery's). A lovely plumose form. 1891.

A. F.-f. regale (regal). *fronds* very broad; pinnæ broad, prettily crested at the apex. 1889. A charming variety.

A. F.-f. setigerum grandiceps (bristle-bearing, large-headed). *fronds* erect, about 1ft. high, with a heavily-crested tuft at the apex; pinnæ divided and crested at the ends in an extraordinary manner. 1893.

A. F.-f. velutinum (velvety). A beautiful, dwarf, densely-branched variety, dwarfer than its parent *A. F.-f. acrocladon*, also closer and more compact in habit: this and the finely-divided apices give the plant the appearance of a ball of green velvet. 1892.

FIG. 110. FROND OF ASPLENIUM FLABELLIFOLIUM.

Asplenium—*continued.*

A. F.-f. Victoriæ. It is difficult to adequately describe the beauty of this "Queen of Lady Ferns," but Fig. 109 gives a good idea of the appearance of its fronds.

FIG. 111. ASPLENIUM FORMOSUM.

A. flabellifolium. Although not generally popular, this curious and pretty evergreen species is well worth growing in small baskets, or for covering the surface of the soil in small Fern-cases. See Fig. 110.

A. fœcundum (prolific). A popular name for *A. compressum.*

A. fœniculaceum (Fennel-like). A variety of *A. fragrans.*

FIG. 112. ASPLENIUM FRAGRANS FŒNICULACEUM.

Asplenium—*continued.*

A. formosum.* The lovely fronds of this elegant, delicate-looking, evergreen species are produced abundantly from a very short stem; and the wiry, polished nature of its dark stipes approaches the *A. Trichomanes* group. See Fig. 111.

A. fragrans fœniculaceum. The fronds of this charming garden variety are 10in. to 15in. long, including the stipes, and are only bipinnatifid. See Fig. 112.

FIG. 113. ASPLENIUM GERMANICUM.

A. fraxinifolium (Ash-leaved). A synonym of *A. bantamense.*

A. furcatum laceratum (torn). *fronds* broader, flatter, and more distinctly incised than in the type.

A. gemmiferum (bud-bearing). *fronds* of a more papery texture and generally proliferous at their extremities; otherwise closely resembling those of the popular *A. obtusatum. sori* copious, broad, falling short of both edge and midrib. South Africa, &c. Greenhouse.

A. germanicum. This species is allied to *A. Ruta-muraria.* See Fig. 113.

A. Griffithianum (Griffith's). *sti.* tufted, short, erect. *fronds* lanceolate, 6in. to 9in. long, ⅜in. to 1in. broad, acuminate, very gradually narrowed below, crenate-serrated, sub-coriaceous. *sori* reaching from the midrib two-thirds of the way to the edge. Assam and Sikkim. Greenhouse.

A. Harrisi (Harris's). *rhiz.* little larger than a pin's head. *sti.* tufted, thread-like, 1in. to 1½in. long. *fronds* pinnate, semi-erect or prostrate, 3in. to 5in. long, ¼in. to ½in. wide, attenuated into a naked, thread-like tail, proliferous at the end. *sori* medial, oblique. Jamaica (7000ft.); 1895. A fragile little, half-hardy species, allied to *A. viride.*

A. Hemionitis multifidum. The habit of this distinct variety, which has fronds quite as broad as they are long, is well shown in Fig. 114.

A. heterocarpum. A frond of this very distinct species is shown in Fig. 115. In habit the plant somewhat resembles a miniature Adiantum.

A. heterophlebium (variously veined). *sti.* 1ft. long, grey, scaly. *fronds* thinly herbaceous, 1ft. to 1½ft. long, 8in. to 9in. broad, with six to eight pairs of pinnæ below the pinnatifid apex; lowest pinnæ 2in. or more apart, 3in. to 4in. long, 1in. to 1½in. broad, acute, cordate at base, dark green, the edges undulated, naked; rachis villous; veins pinnate. *sori* not reaching the edge. Eastern Himalayas. SYN. *Anisogonium heterophlebium.*

A. hians (gaping). *sti.* 1ft. to 1½ft. long, slightly scaly. *fronds* 3ft. to 4ft. long, 2ft. to 3ft. broad; pinnæ thin, papery, dark green, the lower ones 1ft. or more in length and 4in. to 6in. broad; pinnules numerous, lanceolate, with blunt lobes reaching nearly to the rachis. *sori* short, oblong, only the lower ones being double. West Indies and Ecuador. An almost arborescent, stove species. SYN. *Diplazium hians*

Asplenium—*continued.*

FIG. 114. ASPLENIUM HEMIONITIS MULTIFIDUM.

A. horridum (horrid). *sti.* strong, erect, brownish, fibrillose. *fronds* 2ft. to 3ft. long, 8in. to 12in. broad; pinnæ numerous, spreading, 4in. to 6in. long, acuminate, lobed, cordate or broadly rounded at the base on the upper, truncate on a broad curve on the lower, side; rachis stout, fibrous. *sori* in two nearly parallel lines close to the midrib, a few also on the disk of the lobes. Sandwich Islands, Samoa, and Java, 1884. (H. S. F. iii. 193.)

FIG. 115. FROND OF ASPLENIUM HETEROCARPUM.

Asplenium—*continued.*

FIG. 116. ASPLENIUM INCISUM.

A. incisum. The habit of this Japanese and Chinese species somewhat resembles our British *A. lanceolatum.* See Fig. 116. SYN. *A. elegantulum.*

A. japonicum (Japanese). *rhiz.* slender, creeping. *sti.* straw-coloured. *fronds* 9in. to 15in. long, 4in. to 6in. broad; pinnæ eight to ten, papery, bright green, cut down in the lower part into close, oblong, slightly-toothed lobes. *sori* reaching two-thirds of the way to the edge on both margins. Japan, China, &c. Greenhouse. SYN. *Diplazium japonicum.*

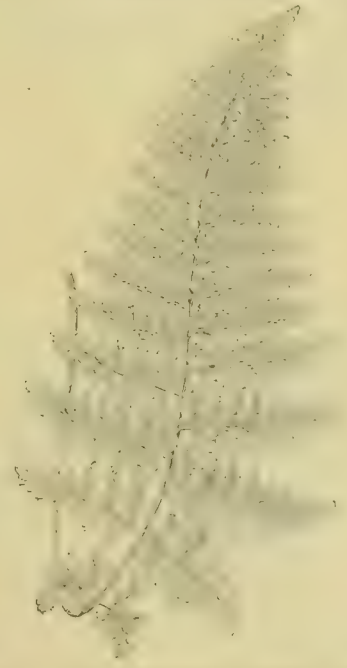


FIG. 117 FROND OF ASPLENIUM LANCEOLATUM.

Asplenium—*continued.*

A. Klotzschii (Klotzschy's). *sti.* strong, upright, dark brown, scaly at base. *fronds* 3ft. to 5ft. long, 9in. to 18in. broad; pinnæ 6in. to 9in. long, 3in. to 4in. broad, deep green, papery; pinnules 2in. to 3in. long, divided into slightly-toothed lobes. Venezuela. Stove. SYN. *Diplazium Klotzschii.*

A. lanceolatum. The Spear-shaped Spleenwort, as this species is commonly called, although indigenous in countries extending from England to Greece, as well as in Algiers, Madeira, the Azores, &c., is nevertheless very local, being found in sheltered, well-drained, and yet moist situations. A frond is shown in Fig. 117.

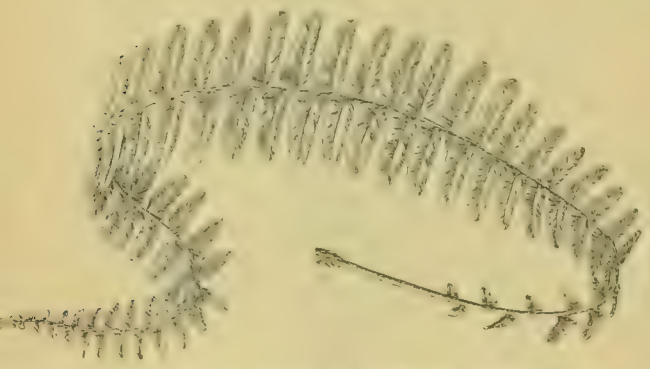


FIG. 118. FROND OF ASPLENIUM LONGISSIMUM.

A. lasiopteris (woolly Fern). A form of *A. Petersoni.*

A. latifolium (broad-fronded). *sti.* strong, erect, smooth, 1ft. or more in length, clothed at base with dark brown scales. *fronds* 3ft. to 4ft. long, 1ft. to 1½ft. broad; pinnæ about twelve on each side, the largest 1ft. long and 4in. broad; pinnules numerous, coriaceous, 2in. long, ½in. broad, and truncate at base, the edges slightly toothed. *sori* linear, about ¼in. long. Ceylon, &c. A greenhouse species, of almost arborescent habit. SYNS. *A dilatatum, Diplazium latifolium.*

A. Lechleri (Lechler's). *sti.* stout, upright, 2ft. to 3ft. long, scaly towards the base. *fronds* 3ft. long, 2ft. broad at the base; pinnæ very coriaceous, 1ft. long, 3in. broad, slightly toothed, tapering to a sharp point, rounded at base. *sori* beginning at the midrib, but falling short of the edge. Peru. A strong-growing, stove species, well adapted for the rockery. SYN. *Diplazium Lechleri.*

A. longissimum. Being an evergreen, this species is furnished at all seasons with its very elegant, pendulous fronds (Fig. 118).

A. lunulatum. There are a number of varieties, including *erectum, Fernandezianum, lobatum, pteropus, tenellum* (SYN. *reclinatum*), and *tripinnatifidum.*

A. Lyallii (Lyall's). A form of *A. obtusatum.*

FIG. 119. ASPLENIUM MARINUM.

Asplenium—*continued.*

A. macilentum (lank). A form of *A. auritum.*

A. marinum. The various situations in which this native species is found largely account for the number of forms observable. The typical plant is well shown in Fig. 119

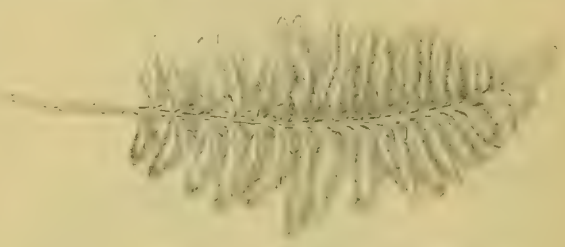


FIG. 120. FROND OF ASPLENIUM MARINUM IMBRICATUM.

A. m. imbricatum (overlapping). *fronds* having the pinnæ so closely placed that they overlap each other for fully one-half of their width; these are auricled at base and minutely dented on the margins. See Fig. 120.

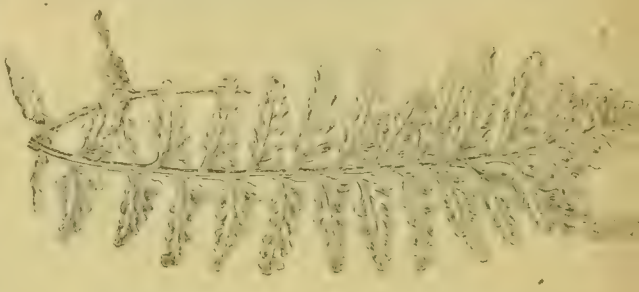


FIG. 121. FROND OF ASPLENIUM MARINUM RAMOSUM.

A. m. ramosum. The fronds of this variety, which are abundantly produced, are very irregularly divided, some being forked from the middle, and a few from the stalks, but most of them are branched near the apex only, as in Fig. 121.

A. Mayii (May's).* *fronds* dark purplish-green, short, gracefully arched, freely produced; pinnæ deeply notched. 1894. A seedling, of tufted habit, of which *A. Baptistii* is probably one of the parents. Stove.

FIG. 122. ASPLENIUM MONANTHEMUM, showing Habit and detached Basal Portion of Frond, with Bulbils.

Asplenium—*continued.*

A. monanthemum. The fronds of this species produce bulbils at the axils of the basal pair of pinnæ only, the plant being in this respect different from most other cultivated Aspleniums. See Fig. 122.

A. nigripes (black-footed). *sori* linear-oblong, often curved, disposed principally in two parallel rows close to the midrib of the pinnules. Otherwise this greenhouse species resembles *A. macrocarpum.* Japan, Nilghiris, &c. SYN. *Athyrium nigripes.*

A. nigro-paleaceum (dark-chaffy). *cau.* decumbent. *sti.* 1ft. to 1½ft. long, ¼in. thick, thicky clothed with nearly black scales. *fronds* thick, 2ft. to 3ft. long and nearly as broad; lower pinnæ 1ft. to 1½ft. long, 6in. to 8in. broad; pinnules numerous, spreading, 3in. to 4in. long, 1in. broad, cut down half or two-thirds to the rachis into incised-crenate lobes ¼in. broad; texture thick; rachis slightly zigzag. *sori*, lower ones ¼in. long. St. Helena. Greenhouse. SYN. *Diplazium Loddigesii.*

A. niponicum (Nipon). *rhiz.* creeping, with lanceolate, reddish scales. *sti.* 6in. to 12in. long, glossy, straminous. *fronds* herbaceous, 1ft. or more in length, 6in. to 8in. broad; pinnæ lanceolate, distinctly stalked, cut down nearly or quite to the rachis below into oblong-lanceolate, unequal-sided pinnules, which vary from sub-entire to deeply pinnatifid; rachis and both sides naked, often tinged with purple. *sori* copious, the lower ones often horseshoe-shaped. Japan and China. Greenhouse. SYN. *Athyrium niponicum.* There is a crested variety.

FIG. 123. FROND OF ASPLENIUM NITIDUM.

A. nitidum. This decorative species is found on the Nilghiri Mountains at an altitude of 4000ft. A frond is shown in Fig. 123.

A. nobile (noble). A variety of *A. viviparum.*

A. nodulosum (slightly noduled). A synonym of *A. lineatum.*

A. obliquum (oblique). A form of *A. obtusatum.*

A. obtusatum Lyallii (Lyall's). *fronds* herbaceous, nearly 1½ft. long, 9in. broad; lower pinnæ lanceolate-deltoid, 6in. long, cut down into deeply-toothed pinnules, which are cuneate at base and distinctly stalked.

A. o. obliquum (oblique). *fronds* cartilaginous, often more than 1ft. long and 6in. broad; pinnæ more numerous than in the type, often 4in. long and 1in. broad, gradually narrowed to an acute point. *sori* in lines ¼in. to ⅜in. long and closer.

A. obtusilobum. On account of its very peculiar mode of growth, this pretty, dwarf species is readily distinguished from all others. Instead of the proliferation being, as is usual in many Aspleniums, located at the extremity of the fronds, it consists in the slender, filiform growths which start from the base of the plant. See Fig. 124.

Asplenium—*continued.*

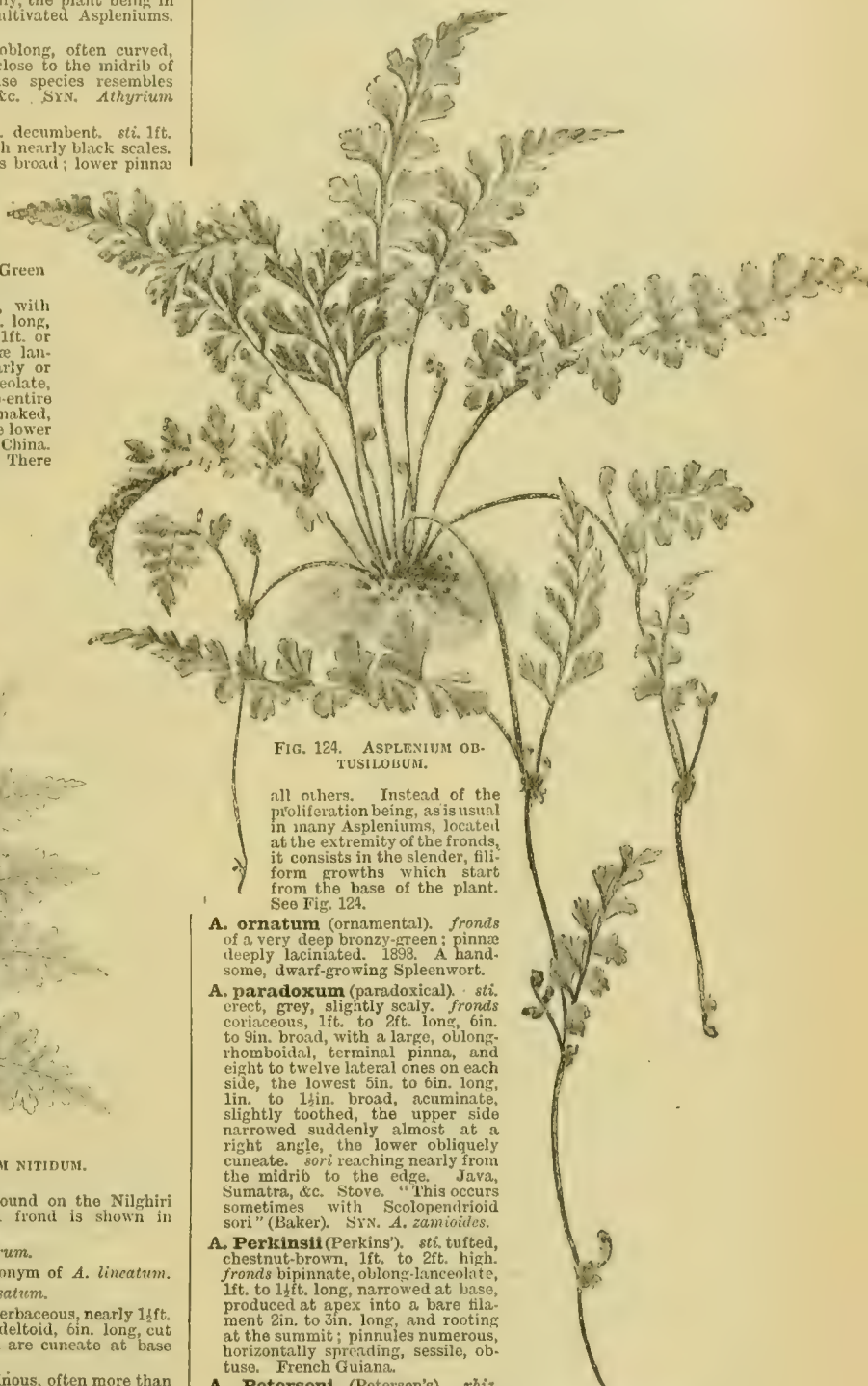


FIG. 124. ASPLENIUM OBTUSILOBUM.

A. ornatum (ornamental). *fronds* of a very deep bronzy-green; pinnæ deeply laciniated. 1893. A handsome, dwarf-growing Spleenwort.

A. paradoxum (paradoxical). *sti.* erect, grey, slightly scaly. *fronds* coriaceous, 1ft. to 2ft. long, 6in. to 9in. broad, with a large, oblong-rhomboidal, terminal pinna, and eight to twelve lateral ones on each side, the lowest 5in. to 6in. long, 1in. to 1½in. broad, acuminate, slightly toothed, the upper side narrowed suddenly almost at a right angle, the lower obliquely cuneate. *sori* reaching nearly from the midrib to the edge. Java, Sumatra, &c. Stove. "This occurs sometimes with Scolopendrioid sori" (Baker). SYN. *A. zamioides.*

A. Perkinsii (Perkins'). *sti.* tufted, chestnut-brown, 1ft. to 2ft. high. *fronds* bipinnate, oblong-lanceolate, 1ft. to 1½ft. long, narrowed at base, produced at apex into a bare filament 2in. to 3in. long, and rooting at the summit; pinnules numerous, horizontally spreading, sessile, obtuse. French Guiana.

A. Petersenii (Petersen's). *rhiz.* wide-creeping. *sti.* 6in. to 9in. long, erect, dark, villous. *fronds* 1¼ft. to 1½ft. long, 6in. to 8in. broad, with eight to ten pinnæ on each side below the pinnatifid apex; largest pinnæ 3in. to 4in. long, 1in. to 1¼in. broad, the lower lobes cut down nearly or quite to the rachis, ⅜in. to ½in.

Asplenium—*continued.*

deep, obtuse; texture herbaceous, the dark rachis and dark green fronds villous on both sides. *sori*, lower ones ¼in. long. Canton, &c. Stove. SYN. *Diplazium decussatum* (of gardens). *A. lasiopteris* is a form of this species.

A. pinnatifidum. This species bears a certain resemblance to the Walking Leaf of North America (*Scolopendrium rhizophyllum*), but rarely, if ever, roots at the apex of the fronds. See Fig. 125.

FIG. 125. ASPLENIUM PINNATIFIDUM.

A. polyodon (many-toothed). A synonym of *A. falcatum.*

A. polypodioides (Polypodium-like). *cau.* erect, nearly arborescent. *sti.* stout, green, 1ft. or more in length. *fronds* 4ft. long, 2ft. broad; pinnæ eight or nine on each side, 1ft. long, 6in. broad, thin, papery, bright green; pinnules numerous, cut into narrow-oblong, slightly-toothed lobes. *sori* distinctly falling short of the edge. Himalayas. Greenhouse. SYN. *Diplazium polypodioides.*

A. proliferum (proliferous). A synonym of *A. decussatum.*

A. pteridoides (Pteris-like). *sti.* 3in. to 4in. long, naked. *fronds* flaccid but firm, oblong-deltoid, 8in. to 9in. long, tripinnatifid, the rachis winged in the upper half; pinnæ close, the lower ones stalked, lanceolate-deltoid, 1½in. to 2in. broad, the lowest rather shorter and broader than the central ones; pinnules rhomboid, sessile, erecto-patent, pinnatifid in the upper half. *sori* on the outside of veins in the lobes only, ¼in. to ½in. long. Lord Howe's Island. Stove.

A. pteropus (wing-footed). A form of *A. lunulatum.*

FIG. 126. FROND OF ASPLENIUM RHIZOPHORUM.

Asplenium—*continued.*

A. pubescens (downy). A synonym of *A. esculentum.*

A. reclinatum (reclinate). A variety of *A. lunulatum.*

A. rhizophorum. This species varies greatly in the cutting of its fronds; it is best recognised by its elongated rachis bearing a solitary bulbil at the extremity. See Fig. 126.

FIG. 127. ASPLENIUM RUTÆFOLIUM.

A. rutæfolium. The habit of this beautiful species, which is a native, not only of South Africa, but also of the Himalayas, Ceylon, and Japan, is well shown in Fig. 127.

A. Ruta-muraria. Of this singular native Fern (see Fig. 123) there are several varieties, but owing to their small dimensions they are not very often seen.

FIG. 128. ASPLENIUM RUTA-MURARIA.

A. Sandersoni. The slender, proliferous-tipped fronds of this graceful species are shown in Fig. 129.

A. scandens (climbing). *sti.* scattered on a stout, creeping rhizome, very short. *fronds* 1ft. to 2ft. long, 6in. to 12in. broad, with numerous horizontal pinnæ on each side, which are 4in. to 6in. long, 1½in. broad, cut down to a distinctly winged rachis into numerous sub-distant, ovate-rhomboidal pinnules; pinnules cut down to the rachis throughout; lower segments again pinnatifid; ultimate divisions narrow-linear. *sori* solitary, marginal. New Guinea, &c., 1887. Stove. SYN. *Darea scandens.*

A. Schimperi (Schimper's). *rhiz.* wide-creeping, ½in. thick, with bright brown basal scales. *sti.* 3in. to 9in. long, naked. *fronds* firm, membranous, oblong-lanceolate or oblong-deltoid, 1ft. to 1½ft. long, 3in. to 9in. broad, tri- or quadripinnatifid; pinnæ close, lanceolate, stalked, the lowest distant, reduced; segments close, sharply incised-toothed. *sori* small, oblong-reniform. Abyssinia. SYN. *Athyrium Schimperi.*

A. semihastatum (half-hastate). *sti.* 6in. to 9in. long, slender. *fronds* herbaceous, 6in. to 9in. long, 3in. to 4in. broad, pinnatifid at apex, pinnate below; pinnæ mostly simple, oblong, auricled, the lowest stalked, 2in. long, 1in. broad, toothed, and cut nearly or quite to the rachis into spathulate pinnules. *sori* reaching from the midrib nearly to the edge. Cuba. Stove. SYN. *Diplazium semihastatum.*

A. septentrionale. The Forked Spleenwort, as this species is popularly called, is of a very cosmopolitan character, extending from India to the Rocky Mountains. The specific name doubtless refers to its being most frequently found in the Northern districts of Great Britain, where it is, however, very rare. See Fig. 130.

Asplenium—*continued.*

FIG. 129. ASPLENIUM SANDERSONI.

A. Serra (saw). *rhiz.* stout, creeping. *fronds* frequently 4ft. long and 1ft. broad, vivid green, elegantly arching; pinnæ fifteen to twenty pairs, spreading, 4in. to 8in. long, about 1in. broad, sharply toothed, rounded at base on the upper side, wedge-shaped on the lower side. *sori* prominent, disposed mostly in two parallel rows close to the midrib. Brazil, Peru, &c. Stove.

A. sinuatum (sinuate). *sti.* tufted, short, erect. *fronds* coriaceous, lanceolate, 1ft. to 2ft. long, 1in. to 2½in. broad, narrowed to an acuminate apex and very gradually below, the margin slightly undulated but not toothed. *sori* narrow, often on every vein, reaching from near the rachis nearly to the margin. Guinea Coast southward to Angola. Stove.

FIG. 130. ASPLENIUM SEPTENTRIONALE.

A. speciosum (showy). *rhiz.* wide-creeping. *sti.* erect, straw-coloured, 1ft. or more in length. *fronds* 1ft. to 2ft. long, 8in. to 12in. broad; pinnæ thin but firm, 4in. to 6in. long, ¾in. to 1in. broad, conspicuously lobed and slightly toothed, somewhat cuneate at base. *sori* slender, reaching nearly to the edge. Philippine and Malayan Islands. Stove. See Fig. 131. SYN. *Diplazium speciosum.*

A. squamulatum (slightly squamate). *sti.* tufted, 2in. to 4in. long, strong, erect, scaly below. *fronds* very coriaceous, lanceolate, 1ft. to 1½ft. long, 2in. to 3in. broad, narrowed to an acuminate apex and very gradually below into the stem, the margin entire; rachis stout, the lower part furfuraceous. *sori* reaching from near the midrib to within ¼in. or ½in. of the margin. Java, Borneo, &c. Stove.

A. striatum (striped). A synonym of *A. Shepherdi.*

A. tenellum (rather tender). A form of *A. lunulatum.*

A. tenerum (tender). *sti.* tufted, erect, naked, greyish, 4in. to 6in. long. *fronds* herbaceous, 8in. to 15in. long, 3in. to 4in. broad, oblong-lanceolate; pinnæ ten to twenty on each side, stalked, horizontal, 1in. to 1½in. long, ¼in. to ⅜in. broad, deeply toothed, unequal-sided, the lower ones deflexed. *sori* numerous, regular, parallel, not reaching either edge or midrib. Ceylon. Stove. *A. elongatum* is a form of this species.

A. thelypteroides. This species is found in the Sikkim Himalaya, up to 10,000ft. elevation, as well as in North America. The frond shown in Fig. 132 has the stipes rather shorter than is usually the case.

Asplenium—*continued.*

A. tomentosum (downy). *sti.* 6in. to 9in. long, erect, brown-tomentose, at length glossy. *fronds* 6in. to 12in. long, 3in. to 4in. broad, ovate-lanceolate; pinnæ numerous, closely placed, lanceolate, the lower pair deflexed, the next horizontal, 2in. to 3in. long, ¼in. broad, acute, the edge cut down regularly into oblong-falcate lobes ⅛in. broad; rachis finely tomentose. *sori* linear, touching the edge but not the midrib. East Indies, &c. Stove. SYN. *Diplazium tomentosum.*

A. unilaterale (one-sided). A synonym of *A. resectum.*

A. vagans (wandering). *sti.* tufted, 1in. to 2in. long, pale green. *fronds* coriaceous, 3in. to 4in. long, ¼in. to ⅜in. broad, widely straggling, elongated and rooting at the apex; pinnæ eight to twelve on each side, sessile, sub-rhomboidal. *sori*

FIG. 131. ENTIRE FROND AND DETACHED PINNA OF ASPLENIUM SPECIOSUM.

FIG. 132. FROND OF ASPLENIUM THELYPTEROIDES.

Asplenium—*continued.*

two or three to a pinna, placed near the margin. St. Thomas' Island, &c. Stove.

A. viviparum nobile (noble). *fronds* beautifully feathery, much more open and flat than in the type, 1½ft. long, quadripinnate; ultimate segments three times as long as those of the type, pendulous. *sori* abundant on the margins of the segments. New Guinea. Young plants are produced on the upper surface of the mature fronds.

A. zamioides (Zamia-like). A synonym of *A. paradoxum.*

ASPREGENIA. A synonym of **Octomeria** (which *see*).

ASPRELLA. *See* **Asperella.**

ASTELIA (from *a*, privative, and *stele*, a pillar; in allusion to some of the species living on trees, but not being parasitic). SYN. *Hamelinia.* ORD. *Liliaceæ.* A genus embracing about nine species of mostly greenhouse perennials, clothed with silky, shaggy, or chaff-like hairs, and with a short, thick rhizome, natives of New Zealand, the Pacific Islands, the mountains of Australia, Tasmania, and Antarctic America. Flowers white, greenish or purple, polygamo-dioecious, small, in dense racemes or panicles; perianth marcescent, persistent, six-parted. Leaves radical or crowded at the base of the scape, sheathing it. The species thrive in a compost of equal parts peat and loam, and may be propagated by divisions, in spring.

A. Banksii (Banks's). *fl.* greenish; perianth ¼in. in diameter; panicle densely silky, 4in. or more in length. *l.* 2ft. to 5ft. long, ¾in. to ⅝in. broad, glabrous or silky. New Zealand.

A. Cunninghamii (Cunningham's). *fl.* green, numerous; perianth rotate, ¼in. in diameter. *l.* 2ft. to 5ft. long, ¾in. to 1in. broad, spreading and recurved, plaited, silky, and villous. Scape 1in. to 1½ft. high. New Zealand. Probably half-hardy. (B. M. 5175.)

A. Solandri (Solander's). *fl.* greenish, very much crowded in panicles (male) 6in. to 18in. or (female) 8in. to 12in. long; perianth, male ¼in. long, female much smaller. *l.* 2ft. to 4ft. long, 3in. broad, spreading and recurved, clothed at base with dense, silky wool. Scape stout. New Zealand, 1864. (B. M. 5503.)

ASTELMA. Botanists include this genus under **Helipterum** (which *see*), the specific names remaining unchanged.

ASTER. SYN. *Pinardia.* Bentham and Hooker include the following genera (among many others) hereunder: *Bellidiastrum*, *Calimeris*, *Dieteria*, *Galatella*, *Linosyris*, *Machæranthera*, *Diplopappus*, and *Tripolium.* There are, according to those authorities, about 200 distinct species of this genus (nearly 350 have been described as such); they are most copious in the Northern hemisphere, particularly in America, where about 120 occur.

Of this extensive genus no section of it has been so much improved as that known as Michaelmas Daisies, Starworts, and Perennial Asters. The first name nowadays is, however, somewhat of an anachronism, seeing that many of the newer species and varieties blossom as early as July, and by a judicious selection it is possible to have bright and useful flowers for cutting onwards until winter arrives. The Perennial Asters of the present day are very different from the Michaelmas Daisies of old, many of which were poor and washed-out as to colour, and weedy and straggling as to habit. They are essentially flowers for the amateur, as they are not fastidious as to soil or surroundings, and may be grown in towns as well as in the country if but a little attention is bestowed upon them. They are far more useful, because more enduring and floriferous, than the usual tender occupants of beds and borders, which are allowed to drag out a miserable existence after the zenith of their beauty in late summer is passed, and they should be more extensively cultivated. A fillip was most certainly given to their culture after the Aster Conference of 1891, but they are still far from being sufficiently recognised considering their decorative qualities and their value as cut-flowers for vases and the like. For associating with many of the autumnal flowers—like the Japanese Anemones, the Double Sunflowers, and the Marsh Ox-Eyes—they are excellent, and last, too, whether cut or on the bush, a long time. For pot culture the Perennial Asters are now being much grown.

Aster—*continued.*

FIG 133. ASTER CORDIFOLIUS ELEGANS.

A well-worked, rich soil suits them admirably, and beyond a stout stake to prevent the tall-growing kinds from being broken by the strong winds and heavy rains of autumn, they require very little after-treatment. To see them to the best advantage a good wide border is necessary, allowing the plants ample room to develop, and especially the vigorous kinds. The tall varieties may then be accommodated in the back row, medium growers more towards the centre, and the dwarf varieties may be utilised for the edgings or even for rockeries, as many of them seldom attain more than 6in. in height. Such are *A. alpinus* and its varieties, the best of which are *speciosus* and *superbus.*

Perennial Asters are readily propagated by division in autumn or in spring. The latter, however, is the better season. It will also be found a good plan to discard the old stools—at least, of the strong-growing kinds—every second year, using for replanting only the outside portions. If dry, hot weather should set in, mulching is most beneficial. These Asters, it must be remembered, take a lot out of the soil, and to get the best results liquid manure-water should be occasionally given. Overcrowding must be avoided. It will be found a good plan to cut down the vigorous kinds in July to within 6in.

In the early-flowering section are *A. acris* and its variety *dracunculoides*; *A. Amellus bessarabicus* and Riverslea; *A. cordifolius*; *A. lævis* and its varieties Apollo, Arcturus, and Psyche; *A. Maackii*; varieties of *A. Novæ-Belgii*, like *lævigatus*, Purity, Harpur Crewe, Daisy Hill, and Madonna; and *A. Shortii.* Later come varieties of *A. lævis*—*decorus*, *floribundus*, *formosissimus*, and Ariadne; the compact little *A. dumosus*; *A. cordifolius elegans* (Fig. 133) and *A. c. albulus*; *A. ericoides Clio*; *A. Lindleyanus nanus*; Coombe Fishacre; *A. Linosyris*; a veritable host of garden forms of *Novæ-Belgii* in Robert Parker, John Wood, Nancy, Autumn Glory, Daphne, Ella, Margaret Jarvis, and White Spray; several good varieties of *A. Novæ-Angliæ* in *præcox*, *roseus*, *ruber*, and W. Bowman; and the exquisitely graceful *A. vimineus* and its form Cassiope. This last is one of the gems of the whole collection. Still later are *A. Novæ-Angliæ pulchellus*; *A. grandiflorus*; *A. Tradescantii*; *A. ericoides*, another graceful species; *A. amethystinus*; *A. diffusus*

Aster—*continued.*

horizontalis; A. d. pendulus; and the well-known *A. turbinellus.*

To those described on pp. 136-9, Vol. I., the following should be added. Several plants formerly classed under *Aster* are now transferred to **Callistephus, Erigeron, Felicia, Heteropappus, Inula, Microglossa, Olearia,** and **Sericocarpus.**

A. abbreviatus (shortened). A synonym of *A. patulus.*

A. Alberti (Albert Regel's). *fl.-heads* pale purple, terminal, solitary, 1in. in diameter; involucral scales in four series; ray florets linear, spreading. *l.* scattered, linear, slender, acute. Stems ascending, branching. Turkestan, 1884. SYN. *Calimeris Alberti* (R. G. 1152, f. 2, e-g).

A. albescens (whitish). A synonym of *Microglossa albescens.*

A. alpinus speciosus (showy).* *fl.-heads* showy, about 3in. in diameter; ray florets purple; disk orange. *h.* 1½ft. 1883. A dwarf, free-flowering variety. (R. G. 1283, 1276, f. 1.)

A. amelloides (Amellus-like). A synonym of *A. Amellus bessarabicus.*

A. amethystinus (amethystine-violet). *fl.-heads* rather numerous, racemosely disposed, with squarrose or spreading tips to the well-imbricated bracts; ray florets amethystine violet or purple, ½in. long. October. *l.* not rigid; cauline ones small, all linear and entire, not at all or scarcely narrowed at the abrupt, closely sessile or partly amplexicaul base. *h.* 2ft. to 3ft. North America. Plant paniculately much branched. SYNS. *A. bostoniensis* and *A. pilosus* (of gardens).

A. amygdalinus. The correct name is *A. umbellatus.*

A. Bellidiastrum. The correct name of *Bellidiastrum Michelii.*

A. bicolor (two-coloured). *fl.-heads* numerous, disposed in long corymbs; ray florets pinkish-white, passing into pink, and eventually turning lilac; disk yellow, turning purple. August and September. A garden form.

A. bostoniensis (Boston). A garden synonym of *A. amethystinus.*

A. cæspitosus (tufted). This is a dwarf and very floriferous garden form of *A. Novæ-Belgii*, with small flower-heads and leaves. August and September. North America. (B. R. xix., 1571.)

A. Chapmani (Chapman's). *fl.-heads* violet, showy, about ½in. across; involucre imbricated in several ranks, the bracts acute or mucronate. *l.*, radical ones spathulate-linear, 5in. to 9in. long, including the long-attenuated base; cauline ones becoming subulate-filiform and erect. Stem simple and slender, 2ft. to 3ft. high, with a few one-headed branches at the summit. North America.

A. cordifolius elegans (elegant).* A charming variety, producing its delicately-tinted blossoms in dense, plume-like masses. DIANA is a beautiful form of this.

A. coriaceus (leathery). A synonym of *Celmisia coriacea.*

A. coronopifolius (Coronopus-leaved). A synonym of *A. tanacetifolius.*

A. Curtisii (Curtis's). *fl.-heads* bright lilac, large, paniculate; involucre hemispherical, the much-imbricated bracts conspicuously appendaged with foliaceous tips. *l.*, radical and lower ones 3in. to 4in. long, ovate-lanceolate, acuminate, sparingly serrated, abruptly contracted into winged petioles; upper ones lanceolate, sessile. Stems 2ft. to 3ft. high. North America. A very showy plant.

A. Delavayi (Delavay's). This species is closely related to *A. Vilmorini*, but differs in having the disk of a permanent violet-brown instead of yellow shading off to brown. Yunnan, 1897.

A. diffusus horizontalis (horizontal).* *fl.-heads* having more conspicuous white ray florets than in the type. *l.* thickish; those of the widely-spreading flowering branches small and short, entire. A robust, very bushy and floriferous, garden variety. SYN. *A. horizontalis.* See Fig. 134.

A. diplostephioides (Diplostephium-like). Himalayan Aster. *fl.-heads* solitary, inclined, 2in. to 3in. in diameter; involucre broadly hemispherical, the bracts lanceolate; ray florets bright purple, numerous, biseriate; disk purple. May and June. *l.*, radical ones 2in. to 4in. long, obovate, varying to oblanceolate, acute, entire, narrowed to long or short petioles; cauline ones 2in. to 3in. long, sessile, semi-amplexicaul. Stem stout, 6in. to 18in. high, leafy. Sikkim, 1882. A glandular-pubescent, tomentose, or villous perennial. (B. M. 6718.)

A. foliosus is a variety of *A. vimineus.*

A. formosissimus (very beautiful).* *fl.-heads* disposed in a loose, pyramidal panicle; ray florets of a beautiful bluish-lilac; disk at first yellow, turning purple. September. *l.* alternate, ovate-lanceolate, acuminate, dark green; lower ones slightly crenulate. *h.* 1½ft. to 2ft. A garden form, of unknown origin.

A. gymnocephalus (naked-headed). *fl.-heads* rose-coloured, 1½in. in diameter. Summer and autumn. *l.* narrow-lanceolate, bristly-toothed. *h.* 1ft. to 1½ft. Southern Texas and Mexico, 1879. A pretty, half-hardy annual, of slender, bushy habit. (B. M. 6549.)

Aster—*continued.*

A. Herveyi (Hervey's). *fl.-heads* loosely corymbiform-cymose; ray florets bright lilac or violet, narrow, ½in. long; involucral bracts all erect. August and September. *l.* minutely serrated; radical and lower ones ovate, on naked petioles; upper ones lanceolate. *h.* 1ft. to 2ft. North America, 1839. (G. & F. 1839, p. 472, f. 131.)

A. hispidus (hispid). A synonym of *Heteropappus hispidus.*

A. horizontalis (horizontal). A form of *A. diffusus.*

A. incisus (cut). *fl.-heads* blue; ray florets ½in. long; involucral bracts reddish-margined. August and September. *l.* lanceolate, attenuated at both ends, remotely incised-serrated. Stem erect, striated, corymbose at apex. *h.* 1ft. to 2ft. Siberia, 1818. SYN. *Calimeris incisa.*

A. Lindleyanus (Lindley's).* *fl.-heads* disposed in loose panicles; ray florets pale violet, ½in. long; involucral bracts linear-attenuated. *l.*, radical and lower ones ovate, more or less cordate, on winged petioles; upper ones ovate- to oblong-lanceolate; uppermost ones sessile and acuminate at both ends. Stem 10in. to 20in. high, rather stout. North America, 1839. (G. & F. 1889, p. 448, f. 127.)

FIG. 134. ASTER DIFFUSUS HORIZONTALIS.

A. Linosyris (Linosyris).* Goldylocks. *fl.-heads* bright yellow, in a rather compact, terminal corymb, without any rays in this country, but occasionally rayed in Germany; involucre imbricated, with numerous narrow bracts. Late summer and autumn. *l.* numerous, narrow-linear, entire, more or less dotted. *h.* 6in. to 12in. Europe. SYNS. *Chrysocoma Linosyris, Linosyris vulgaris.*

A. longifolius roseus (pink). *fl.-heads* pink. A dwarf variety.

A. Maackii (Maack's). *fl.-heads* large, solitary at the apex of the stem or on the branches; ray florets bluish, more than twice as long as the involucre. August. *l.* scattered, lanceolate or narrow-lanceolate, acute or mucronate-acute, 1in. to 2½in. long, ¼in. to ½in. broad, entire or few-toothed, hairy on both sides. Stem 1½ft. to 2ft. high, one-headed or simply corymbose. Japan.

A. Novæ-Angliæ pulchellus (pretty). *fl.-heads* pale magenta. 1882. A very handsome variety, growing about 4ft. high.

A. pallens (pale). A synonym of *A. patulus.*

A. patulus (somewhat spreading). *fl.-heads* ½in. high, loosely paniculate; ray florets light violet or purple, varying to white. September. *l.* ovate- or oblong-lanceolate, sharply serrated in the middle, acuminate at both ends. *h.* 2ft. to 4ft. North America. SYNS. *A. abbreviatus, A. pallens* (B. R. 1509). There is also a dwarf, early-flowering form in cultivation.

A. pendulus (pendulous). A form of *A. diffusus*, with narrowish and less serrated leaves, verging towards or connected with *A. vimineus.* North America.

A. Piccoli (Father Piccoli's). *fl.-heads* having lilac ray florets and a yellow disk. *l.*, cauline ones sessile, oblong, coarsely toothed. Shen Si, China, 1899. (B. M. 7670.)

A. pilosus (pilose). A garden synonym of *A. amethystinus.*

A. polyphyllus (many-leaved).* *fl.-heads* ½in. high, paniculate; ray florets white, inclined to turn rosy-purple, numerous; involucral bracts linear-subulate. September. *l.*, cauline ones narrow-lanceolate or linear, 4in. to 5in. long, ¼in. to ½in. broad; those of the flowering branchlets small and subulate-linear. *h.* 3ft. North America.

A. pseudamellus (false Amellus). *fl.-heads* few, corymbose, 1in. to 1¾in. in diameter; ray florets bluish-purple; involucral bracts larger than in *A. Amellus*, with reflexed, leafy tips. Autumn. *l.* 1in. to 2in. long, oblong, acute or obtuse, entire or toothed. *h.* 6in. to 18in. Western Himalayas (8000ft. to 13,000ft.), 1836.

A. ptarmicoides (Ptarmica-like). *fl.-heads* several or numerous in a corymbiform head, small; ray florets white, ¼in. to ½in. long; involucre campanulate or somewhat turbinate, the bracts rigid. *l.* firm, linear or the lower ones spathulate-lanceolate. *h.* 6in. to 20in. North America. Plant varying from smooth or minutely scabrous to slightly hairy-pubescent.

A. punctatus (dotted). A synonym of *A. acris.* SYN. *Galatella punctata.*

A. repertus (a discovery). *fl.-heads* disposed in an ample panicle; ray florets reddish-pink; disk at first yellow or yellowish white, turning purple. September and October. *l.* alternate,

Aster—*continued.*

lanceolate, acute, slightly amplexicaul, bright green. *h.* 2ft. to 3ft. North America. A garden plant. There is a variety *cæruleus* with flowers of a bluish-lilac.

A. roseus (rosy). *fl.-heads* nearly 2in. across, disposed in a large corymb; ray florets of a beautiful bright rose; disk golden-yellow. *l.* lanceolate, sessile, pubescent, greyish-green. North America. Probably a variety of *A. Novæ-Angliæ*. (It. H. 1893, p. 103.)

A. rotundifolius (round-leaved). The correct name of *Agathæa cœlestis*.

A. Strachcyi (Strachey's). *fl.-heads* pale lilac-blue, ⅜in. to 1¼in. in diameter; involucral bracts reddish-brown; ray florets linear, the tips minutely notched; scapes rich dark brown, 2in. to 5in. high. May. *l.*, radical ones 1in. to 1½in. long, shortly petiolate, oblanceolate or obovate, pale beneath; those on the stolons much smaller and more sessile; those on the scapes few, linear or linear-obovate. Western Himalayas, 1885. (B. M. 6912.)

A. tanacetifolius (Tansy-leaved). *fl.-heads* ½in. high; ray florets bright violet, numerous; involucral bracts narrow-linear. July. *l.*, lower ones twice or thrice pinnately parted; uppermost ones simply pinnatifid or those on the flowering branchlets entire; lobes short, setulose-mucronate. *h.* 1ft. to 2ft. North America, 1851. A pubescent, often rather viscid annual. SYNS. *A. coronopifolius, Dieteria coronopifolia, Machæranthera tanacetifolia* (B. M. 4624).

A. tenuifolius (slender-leaved). *fl.-heads* about ½in. high; ray florets violet, showy; involucre turbinate, its bracts very acute. August. *l.* thickish, almost fleshy, linear, tapering to both ends, acute; lower ones with a long, tapering base; upper ones subulate-attenuated. Stem simple or paniculately branched above, 1ft. to 2ft. high. North America, 1725.

A. tenuifolius (of Willdenow). A synonym of *A. ericoides*.

A. Thomsoni (Thomson's). *fl.-heads* pale lilac, 1½in. to 2½in. in diameter, few, on long peduncles; involucral bracts linear-lanceolate; pappus reddish. August to October. *l.* sub-sessile, 2in. to 4in. long, 1in. to 1½in. broad, broadly-ovate, acuminate, coarsely serrated, half-amplexicaul at base. *h.* 1ft. to 3ft. Western Himalayas. Increased by seeds or cuttings; it should not be divided.

A. tricephalus (three-headed). *fl.-heads* one to three, large and showy; ray florets purple. Autumn. *l.*, radical ones obovate-spathulate, on long, winged petioles, entire, glabrous or hairy; cauline ones oblong, half-amplexicaul. Stems puberulous. *h.* 1½ft. Sikkim (10,000ft. to 14,000ft.), 1886.

A. trinervis (three-nerved).* *fl.-heads* blue; ray florets longer than those of the disk; involucral scales lanceolate; pedicels rigid. August. *l.* lanceolate-linear, mucronate-acute, entire, three-nerved, scabrous beneath and on the margins. Stems erect, corymbose at apex. *h.* 2ft. South of France, 1818. SYN. *Galatella rigida*.

A. trinervius (three-nerved). *fl.-heads* ½in. to ¾in. in diameter, corymbose; ray florets white, narrow; involucral bracts linear. Late autumn. *l.* sessile or petiolate, 1in. to 4in. long, lanceolate, coarsely serrated, very variable. *h.* 2ft. to 3ft. Himalayas, &c., 1891. (R. H. 1892, p. 396.)

A. umbellatus (umbelled). The correct name of *A. amygdalinus*.

A. Vilmorini (Vilmorin's). *fl.-heads* 4in. across, solitary or in pairs, at the top of a long, naked stalk; ray florets bluish-purple. *l.* 4in. to 6in. long, linear-lanceolate, acute, entire. Stems simple. *h.* 1ft. to 2½ft. Western China, 1896.

A. vimineus (twiggy).* *fl.-heads* very small, usually crowded along the branches; ray florets usually pure white; disk sometimes turning purple. September. *l.* linear or narrowly lanceolate, entire, or the lower ones with a few serratures, the longer cauline ones 3in. to 5in. long. Stem 3ft. to 5ft. high, slender, simple, with numerous flowering branches. North America, 1800.

A. v. foliolosus (rather leafy). The correct name of *A. foliosus*.

ASTER, WHITE-TOPPED. *See* **Sericocarpus.**

ASTERACANTHA. This in now included by Bentham and Hooker under **Hygrophila** (which *see*), and the correct name of *A. longifolia* is *H. spinosa*.

ASTERANTHEMUM. A synonym of **Smilacina** (which *see*).

ASTERIAS. A synonym of **Gentiana** (which *see*).

ASTERIDIA. A synonym of **Athrixia** (which *see*).

ASTERISCUS (of Mœnch). A synonym of **Odontospermum** (which *see*).

ASTERISCUS (of Schultz "Bipontinus"). A synonym of **Pallenis** (which *see*).

ASTEROMA VAGANS. *See* **Syringa Fungi.**

ASTEROPTERUS. A synonym of **Leyssera** (which *see*).

ASTEROSPERMA. A synonym of **Felicia** (which *see*).

ASTEROSTIGMA. Included under **Staurostigma** (which *see*).

ASTILBE. SYN. *Holcia*. There are about half-a-dozen species of this genus, natives of the Himalayas, Java, Japan, and Eastern North America. To those described on pp. 140-1, Vol. I., the following should be added:

A. chinensis (Chinese).* *fl.* white, with a rose or purplish tinge, densely clustered on rather short spikes. July. Stem branched. *h.* 1½ft. to 2ft. China, 1892. In habit this species resembles the well-known *A. japonica*, but the inflorescence is more loosely branched. SYN. *A. odontophylla*.

A. japonica foliis-purpureis (purple-leaved). An ornamental variety having purple leaves and stems. 1885.

A. j. variegata is known in gardens as *Spiræa reticulata*.

A. Lemoinei (Lemoine's). *fl.* pinkish-white, in very loose panicles. A garden hybrid between *A. Thunbergi* and a variety of *Spiræa astilboides*. 1895. (R. H. 1895, p. 567, f. 185.)

A. odontophylla (having toothed leaves). A synonym of *A. chinensis*.

ASTIRIA (from *a*, not, and *steiros*, sterile; in allusion to the absence of barren stamens). ORD. *Stereuliaceæ*. A monotypic genus. The species is a stove, evergreen, stellate-tomentose tree, thriving in a compost of sandy loam and peat. Propagated by cuttings, inserted in sand, under a bell-glass.

A. rosea (pink). *fl.* pink, disposed in axillary, pedunculate cymes; bracteoles three; calyx five-parted; staminal cup truncate, bearing at the apex twenty stamens, all fertile. May. *l.* large, entire, palmately nerved, deeply cordate. Bourbon, 1843. (B. R. 1844, t. 49.)

ASTRAGALUS. Upwards of 600 species have been referred to this genus, three of which are indigenous in Britain. To those described on pp. 141-2, Vol. I., the following should be added:

A. Gilgeanus (Gilge's). *fl.* deep violet. *l.* silvery. Asia Minor, 1896. Perennial.

A. hamosus (hooked). *fl.* pale yellow; calyx matted with hairs; heads six- to twenty-flowered, much shorter than the leaves. May to July. *fr.*, pods ¼in. to 1in. long, cylindrical, much recurved. *l.* 3in. to 6in. long; leaflets distinctly stalked. South Europe, &c., 1683. A curious-looking, trailing perennial. (S. F. G. 723.) The variety *macrocarpus* has large fruit.

ASTRANTHUS. Included under **Homalium** (which *see*).

ASTRANTIA. Four or five species, natives of Europe and Western Asia, are included in this genus. To those described on p. 142, Vol. I., the following should be added:

A. heterophylla (variable-leaved). A synonym of *A. helleborifolia*.

A. minor (lesser). *fl.* and involucre white, the leaves of the latter about equalling the umbel. May and June. *l.* palmate; segments seven to nine, lanceolate, acute, deeply and sharply toothed. *h.* 6in. to 9in. Europe, 1686. There is a variegated form of this.

ASTRAPÆA. This genus is now included under **Dombeya** (which *see*).

A. tiliæflora should be *A. tiliæfolia* (Lime-leaved), and its correct name is *Dombeya acutangula*.

A. viscosa. The correct name is *Dombeya cannabina*.

ASTROCARYUM. About thirty species, all natives of tropical America, have been enumerated. To those described on p. 142, Vol. I., the following should be added:

A. aculeatum (prickly). *fl.*, females sessile; calyx, as well as the rather longer corolla, densely prickly. *fr.* sub-globose, unarmed. *l.*, leaflets linear, præmorse. Stem tall. Guiana, &c.

A. Ayri (native name). *fl.*, spadices often many on the same stem, erect, nearly 2ft. long, simple, at first included in a fusiform, densely prickly spathe. *fr.* 1½in. long, obovate, rostrate, densely bristly. *l.* dense, 8ft. or more in length; leaflets narrow-lanceolate, long-acuminate, silvery beneath, 2ft. or more in length, 1in. broad. Stem 20ft. to 30ft. high, 10in. to 12in. thick. Rio de Janeiro, &c.

Astrocaryum—*continued.*

A. Borsignyanum (Borsigny's). A garden name for *Stevensonia grandifolia.*

A. Malybo (Malybo). The correct name of *A. argenteum.*

A. mexicanum (Mexican).* *fl.*, spathe shining chestnut-colour, terete, slightly prickly; spadix spicate. *fr.* sessile, fusiform, straight or slightly curved, rostrate, densely setose-prickly. *l.*, leaflets alternate, broadly linear, acute, straight; petioles tetragonal, channelled. Caudex cylindrical, 4ft. to 6ft. high. Mexico, 1864. (R. H. 1878, p. 148.)

A. pictum (painted). A garden name for *Stevensonia grandifolia.*

A. vulgare (common). *fl.*, spadix persistent, between the leaves; peduncle 1ft. or more in length, terete. *fr.* scarlet, ovate-globose, 1in. or more in length. *l.* eight or ten, rarely more, very slightly curved, 8ft. to 10ft. long; leaflets lanceolate, long-acuminate, white beneath. Stem 20ft. to 40ft. high, 3in. to 8in. thick, fuscous-greyish. Brazil.

ASTROLOMA. *See* also *Stenanthera. A. longiflorum* is the correct name of *S. ciliata.*

ASYSTASIA. SYN. *Henfreya.* Under this genus Bentham and Hooker include *Dicentranthera* and *Mackaya*, but the latter has been kept distinct on pp. 311-2, Vol. II., of this work. *Asystasia* embraces about a score species, natives of tropical and South Africa, the East Indies, and the Malayan Archipelago. Leaves membranous, entire. To the species described on pp. 142-3, Vol. I., the following should now be added:

A. bella (pretty). The correct name of *Mackaya bella.*

A. coromandeliana (B. M. 4248). The correct name is *A. violacea.*

A. macrophylla. This is figured as *Dicentranthera macrophylla* in B. M. 5696.

A. Thyrsacantha. According to the authors of the "Genera Plantarum," this is the correct name of *Thyrsacanthus indicus*; but C. B. Clarke, in Hooker's "Flora of British India" (iv. 497), classes it under *Eranthemum indicum.*

A. varia (varying). *fl.* mauve and brown, disposed in short, axillary racemes; corolla tubular. *l.* ovate or lanceolate. Stems quadrangular. *h.* less than 1ft. Zululand, 1892.

A. violacea (B. M. 5882). The correct name is *A. coromandeliana.*

ATALANTHUS. Included under **Sonchus** (which *see*).

ATALANTIA. SYN. *Chilocalyx* (of Turczaninow). Bentham and Hooker include *Severinia* under this genus.

ATELANDRA. Included under **Hemigenia** (which *see*).

ATHALIA SPINARUM. This is a species of Sawfly whose larvæ are very destructive to Turnips. They are whitish when first hatched, afterwards assume a dirty green colour, and eventually are black. It is this last colour which is responsible for the numerous popular names by which they are known to farmers and gardeners: Black Palmer, Black Canker, Black Slug, Blacks, and Niggers. *See* also **Turnip Sawfly.**

ATHALMUS. A synonym of **Pallenis** (which *see*).

ATHANASIA. About forty species, all strongly scented and glandular, are included in this genus. Flower-heads yellow, homogamous, discoid, usually rather small and densely corymbose; involucral bracts imbricated, in several rows. Leaves alternate, often crowded or small, entire, toothed, incised, or pinnatisect. To the species described on p. 143, Vol. I., the following should be added:

A. crithmifolia (Crithmum-leaved). *fl.-heads* numerous, in a compound corymb, sometimes paniculate. July. *l.* 1in. to 2½in. long, glabrous when adult, three- to five-cleft to the middle, rarely shortly three-cleft or entire; lobes linear, elongated. *h.* 2ft. to 3ft. 1723.

ATHEROPOGON. Included under **Bouteloua** (which *see*).

ATHLIANTHUS. A synonym of **Justicia** (which *see*).

ATHOUS. ORD. *Coleoptera.* Another of the genera furnishing the objectionable "Wireworms." The most destructive species is *A. hæmorrhoidalis*, an elongated downy brown Beetle, from ⅓in. to ½in. long, usually found

Athous—*continued.*

in the perfect state upon Hazels and Birches. The larvæ, however, when hatched, are very destructive to pastures and to cornfields. All the members of this genus are not, however, vegetarians; one species at least, and that a British one, is carnivorous, feeding upon several kinds of other Beetles. Unfortunately it is a rare insect, though occasionally found in decaying Ash and Beech. *See* **Wireworms.**

ATHRIXIA. SYN. *Asteridia.* This genus comprises about fifteen species of stove or greenhouse herbs or under-shrubs, natives of South and tropical Africa, Madagascar, and Australia. Flower-heads yellow, heterogamous, solitary at the tips of the branches or sometimes forming a loose, leafy corymb; receptacle flat, naked. Leaves alternate, entire, tomentose beneath.

ATHROTAXIS. To the species described on p. 143, Vol. I., the following should be added:

A. Gunneana (Gunn's). *l.* ⅛in. to ¼in. long, arranged spirally, spreading, slightly curved upwards, rigid, linear-lanceolate, widest at base, tapering to a spiny point, sessile; lower surface glossy-green, convex; upper surface flat or slightly concave, frequently covered with glaucous powder. Tasmania, 1869. A large, tolerably hardy bush, closely allied to *A. selaginoides.* (R. H. 1869, p. 114.)

ATHRUPHYLLUM. A synonym of **Myrsine** (which *see*).

ATIMETA. Included under **Rhodospatha** (which *see*).

ATRAGENE. Bentham and Hooker include this genus under **Clematis** (which *see*).

ATRAPHAXIS (the old Greek name given by Dioscorides, &c., to Orache). Including *Tragopyron.* ORD. *Polygonaceæ.* A genus embracing about seventeen closely-allied species of hardy, rigid, much-branched shrubs, natives of Central and Western Asia. Flowers often fascicled at the nodes, hermaphrodite, four- or five-parted, the two outer segments often smaller; stamens six to eight, rarely nine. Leaves alternate or fascicled at the nodes, narrow or rather small. The species here described are interesting plants. They should be grown in well-drained heath or sandy soil. Very little pruning will be required. Propagation may be effected by cuttings, or by layers.

A. buxifolia (Box-leaved). *fl.* white, nodding, produced in long racemes. July. *fr.* red. *l.* deciduous, obovate, obtuse, tipped with a short mucro, light green, about 1in. in diameter, the lateral margins undulated. *h.* 2ft. Siberia, 1800. SYNS. *Polygonum crispulum* (B. M. 1065), *Tragopyron buxifolium.*

A. lanceolata (lanceolate). *fl.* pink, in terminal, loose racemes, leafless above. *l.* lanceolate or oblong-lanceolate, acute or mucronulate, attenuated at base, penninerved, the margins recurved. *h.* 2ft. Russia, 1778.

A. l. latifolia (broad-leaved). A synonym of *A. Muschketowi.*

A. Muschketowi (Muschketow's). *fl.* white, about ¼in. broad, with red anthers and ovary; perianth five-parted, the two outer segments reflexed; raceme terminal, the flowers chiefly in whorls. May and June. *l.* 1in. to 1½in. long, oblong, acute, crenulate, shortly petiolate. Central Asia, 1895. (B. M. 7435.) SYN. *Tragopyrum lanceolatum latifolium* (R. G. 1894, t. 1344, f. 1-3).

A. spinosa (spiny). *fl.* white, tinged pink. August. *l.* glaucous, ¼in. long or less, ovate, acute, sub-evergreen, on short petioles. Branches ascending, horizontal, or deflexed. *h.* 2ft. to 3ft. Levant, 1732. (W. D. B. 119.)

ATRIPLEX. About 100 species of herbs and shrubs are included in this genus; they inhabit temperate and sub-tropical regions. Flowers monœcious or dicœcious, glomerate. The following species should be added to that given on p. 144, Vol. I.:

A. halimoides (Halimus-like). *fl.* white, all axillary, the males few in the upper axils, surrounded by females. *l.* ¼in. to 1in. long, mostly lanceolate or ovate-lanceolate, acute, on long petioles. Stems diffuse or procumbent, 6in. to 12in. or more in height. Australia. Plant softly mealy-tomentose. The variety *monumentalis* is a seedling form, growing 9ft. to 10ft. high. 1890. (R. G. 1890, p. 105, f. 24.) SYN. *A. nummularia monumentalis.*

A. Halimus (Halimus). *fl.* purplish, small. July and August. *l.* alternate or opposite, rhombic-oblong. *h.* 5ft. to 6ft.

Atriplex—*continued.*

Sea-coasts of South Europe, &c., 1640 A loose, rambling, hardy, sub-evergreen, glaucous shrub.

A. nummularia (money-like). *fl.* dicœcious, in dense spikes or panicles. *l.* mostly orbicular, rather thick, entire or scarcely sinuate-toothed, ¼in. to 1in. across, or on some luxuriant branches nearly 2in. Branches spreading. *h.* 9ft. to 10ft. Australia, 1890. Whole plant silvery-white tomentose.

A. n. monumentalis (monumental). A synonym of *A. halimoides.*

ATTALEA. About a score species, all tropical American, have been enumerated. To those described on p. 144, Vol. I., the following should be added:

A. excelsa (tall). *fl.*, spadix when fruiting 3ft. to 4ft. long. *fr.* oblong-sub-pentagonal, acute, about 5in. long. *l.* erecto-patent. Stem very tall (nearly 100ft.), erect, often 1½ft. or more in thickness Brazil.

A. speciosa (showy). *fr.* ovate-oblong, conico-rostrate. *l.* erecto-patent. Stem very tall.

Aubrietia—*continued.*

far in advance of those which the gardener of a century ago had at command. Besides the many desirable varieties of *A. deltoidea* there are some exquisitely beautiful garden forms, like Beauté de Bade, Fire King, Royal Purple, and Souvenir de Wm. Ingram.

To the species and varieties described on p. 145, Vol. I., the following should now be added:

A. deltoidea grandiflora (large-flowered). *See under* **A. d. Campbelli.**

A. d. Leichtlini (Leichtlin's).* A very ornamental form, with deep rose-coloured flowers. 1886.

A. d. Mooreana (Moore's). A tufted, compact variety, with blue flowers. *Campbelli* and *Columnæ* are nearly or quite identical with this.

A. d. olympica (Olympian) is a beautiful variety, having soft purple flowers.

A. superba (superb). A form of *A. deltoidea græca.*

FIG. 135. ALPINE AURICULA APOLLO.

FIG. 136. ALPINE AURICULA MELAINE.

A. spectabilis (remarkable). *fl.*, females ternate or quaternate on the branches of the spadix, which is 2ft. to 3ft. long. *fr.* ovate, fuscous-tomentose. *l.*, inner ones erect, outer ones erecto-patent, 18ft. long, with pectinate leaflets, of neat and showy habit. Stem 3ft. to 4ft. high, terete, nearly 1ft. thick, or almost wanting. Brazil.

AUBLETIA (of Gærtner). A synonym of **Sonneratia** (which *see*).

AUBLETIA (of Loureiro). A synonym of **Paliurus** (which *see*).

AUBLETIA (of Schreber). A synonym of **Apeiba** (which *see*).

AUBRIETIA. This genus consists of five species natives of Italy, Greece, Asia Minor, and Persia. Though Aubrietias are usually associated with the rock-garden, there is no reason why they should be so restricted as regards their use. They are equally beautiful when grown in a sunny border as edgings, or even in spring beds; while they may also be advantageously employed on sloping banks, and even upon walls. Aubrietias are old inhabitants of our gardens, but the kinds available now are

AUCUBA. Variegated Laurel. Three to five species, natives of the Eastern Himalayas, China, and Japan, are included in this genus. Flowers lurid purple, small, dicœcious, in axillary panicles; males having a small four-toothed calyx, valvate petals, four stamens, and a fleshy disk; females having the calyx-tube ovoid, the limb four-toothed, petals as in the males, and no rudiments of stamens. Leaves opposite, petiolate, ovate or lanceolate, obtusely serrated, coriaceous, shining, blackish when dry. In addition to the species described on p. 145, Vol. I., only the following variety calls for mention:

A. japonica fructu-albo (white-fruited). *fr.* pale greenish-white, much larger than in the variegated forms. *l.* wholly green, shining, stiff. 1893.

AUDIBERTIA (named in honour of M. Audibert, a celebrated nurseryman of Tarascon). ORD. *Labiatæ.* A genus comprising seven or eight species of nearly hardy, villous or cano-tomentose shrubs, confined to North America. Flowers scarlet, violet, or bluish, resembling those of *Salvia* (of the *S. officinalis* type); whorls often densely many-flowered. Leaves entire or crenate,

Audibertia—*continued.*

serrulated, reticulated. Only one species calls for description here. It thrives in any fairly good soil, and may be increased by seeds, or by cuttings.

A. incana (woolly). *fl.* pale blue; corolla less than 1in. long; bracts pubescent and ciliated, tinged with purple. Summer. *l.* spathulate or obovate, obtuse or retuse, entire or sparsely crenulate, seldom 1in. long. *h.* 1½ft. California, 1827. (B. R. 1469.)

AUDIBERTIA (in part). A synonym of **Mentha** (which *see*).

AUGEA (of Retzius). A synonym of **Lanaria** (which *see*).

AULACOPHYLLUM. Included under **Zamia** (which *see*).

AURELIANA. A synonym of *Bassova*. *See* **Witheringia.**

AURICLE. An ear-like appendage.

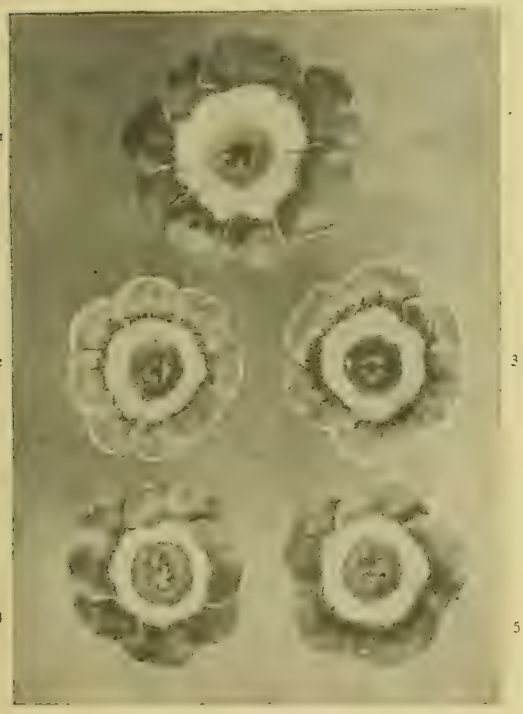


FIG. 137. SHOW AURICULAS: 1, Snitherfield Green; 2, Miss Prim; 3, Marmion; 4, George Lightbody; 5, Rev. F. D. Horner.

AURICULA. Since the issue of this work these charming spring flowers have taken quite a new lease of life, and alike for pots, the rockery, and the flower border, they are appreciated at their true worth. Few florists' flowers can boast such a time-honoured record as the Auricula, of which there is abundant evidence that it existed in gardens three centuries ago. Unfortunately the Show section (Fig. 137) is not suited for outdoor work unprotected, as the beautiful meal-like substance which characterises both flowers and foliage would be spoilt if the plants were exposed to heavy rains. Against the Alpines, however, no such objection can be urged, as they are destitute of farina, and there is, in fact, every reason why they should be found in collections of hardy spring flowers. Two promising varieties in this Section are illustrated at Figs. 135 and 136. Although many of the varieties which delighted our forefathers half a century or more

Auricula—*continued.*

ago—Champion for instance in the Green-edged, and Richard Headley in the Grey-edged—are still amongst the best in cultivation, the majority of those of even twenty years ago have been superseded, thanks to the skill of the florist. In making a selection of the newer kinds, only those likely to withstand the test of time have been included in each of the following sections:

Alpines.—DEAN HOLE (Douglas), truss large; corolla large, well formed, centre deep yellow; edge dark maroon, shading to crimson. DEFIANCE (Turner), good truss; corolla large, with cream centre; margin dark purple, shading to lilac-purple. DIADEM (Gorton), a good old variety of the creamy centre type, the margin shading from deep red to paler red. DUKE OF YORK (Douglas), handsome truss; corolla full-size, orange-yellow centre; margin maroon, shading to crimson. EDITH LODGE (Douglas), good truss; corolla large, yellow centre; margin yellowish-bronze. EVELYN PHILLIPS (Phillips), gold centre; margin deep red, shading to pale red. FRIENDSHIP (Douglas), good truss; finely-formed corolla, gold centre; margin dark red, shading to pale red. MRS. HARRY TURNER (Turner), a beautiful variety, with cream centre; margin maroon-purple, shading paler. MRS. MARTIN SMALL (Phillips), creamy-yellow centre; margin maroon-red, shading paler. MRS. PATRICK CAMPBELL (Douglas), vigorous plant, good truss; corolla large, centre clear yellow; margin buff, shading paler.

Green-edged.—ABBÉ LISZT, neat plant, truss well formed, tube deep yellow; paste white and dense, black ground; edge light green. JOHN GARRETT (Adams), tube pale yellow; good paste, dark ground, and full green edge. PRINCE OF GREENS (Trail), tube pale yellow; paste fine, good dark ground; edge superb green. REV. FRANCIS D. HORNER (Simonite), tube gold; paste white, black ground; edge fine green; corolla and truss large. SHIRLEY HIBBERD (Simonite), tube gold; paste white, black ground; edge fine green; a very fine variety SNITHERFIELD GREEN, a good variety, but comes slightly mealed sometimes. TALISMAN (Simonite), a very pretty variety, of fine quality; small plant and truss.

Grey-edged.—COLONEL CHAMPNEYS (Turner), good tube and paste, violet ground; edge light grey; a vigorous variety with slightly mealed foliage. GEORGE RUDD (Woodhead), clean yellow eye, black ground; edge distinct grey; mealed foliage. LANCASHIRE HERO (Lancashire), fine black ground; edge grey, inclining to green; green foliage, MABEL (Douglas), tube good; paste white, black ground; edge greenish-grey; a finely-proportioned flower. MARMION (Douglas), tube yellow; paste white, black ground; edge decided grey, well proportioned; foliage finely mealed. RICHARD HEADLEY (Lightbody), tube golden; paste dense white, quite black ground; edge silvery-grey; foliage green; a late variety. RINGLEADER (Kenyon), edge fine grey; foliage green; this is the reputed parent of GEORGE LIGHTBODY. SILVIA (Douglas), tube gold; paste good round and white, black ground; foliage green. WILLIAM BROCKBANK (Mellor), tube clear yellow; paste good white, bold black ground; decided grey edge; large truss of flowers.

Selfs.—BLACK BESS (Woodhead), tube orange; paste good white; edge blackish-maroon; foliage green. BUTTERCUP (Horner), tube rich yellow; paste white and circular; edge golden-yellow; foliage green. CHARLES J. PERRY (Turner), a good violet. HEROINE (Horner), tube rich orange; paste dense white and circular; edge dark maroon; bold green foliage. MRS. POTTS (Barlow), tube gold; paste pure white; violet margin; mealed foliage and fine truss. NEGRO (Mellor), tube and paste gold, maroon; foliage green. REV. CHARLES KINGSLEY (Douglas), tube gold; paste white; margin bright violet; foliage mealed. RUBY (Simonite), ruby red; the finest yet raised. SAPPHIRE (Horner), tube pale yellow; paste white; violet-blue edge; foliage mealed. SIR LANCELOT (Douglas), tube orange; edge reddish-maroon; foliage green. SIR WILLIAM HEWITT (Douglas), paste white and circular; a good dark self; foliage green. VULCAN (Sims), tube orange; paste white; margin black; foliage slightly mealed; very distinct.

White-edged.—DR. KIDD (Douglas), edge white and distinct; foliage finely mealed. HEATHER BELL (Simonite), tube pale yellow; paste good white, bluish ground, and edge well-defined. MISS PRIM (Douglas), tube yellow; paste dense white, violet ground; edge medium white; free-growing mealed foliage. MRS. DODWELL (Woodhead), tube yellow; paste white and dense, black ground; good white edge. PRINCESS MAY (Douglas), tube a good yellow; fine blackish ground; edge pure white; foliage green. RELIANCE (Mellor), tube yellow; paste good white, dark maroon ground; edge greyish-white; foliage slightly mealed. SNOWDON'S KNIGHT (Douglas), tube rich yellow; paste dense white, black ground; edge very white; foliage mealed.

Beyond the pests referred to in Vol. I. there is only one addition to make. This is the "rot" to which Auricula roots are subject. If, therefore, at the time of potting decay is noticed, such portions should be cut away and dry quicklime pressed firmly into the wound.

AUSTRALIAN FEATHER PALM. *See* **Ptychosperma.**

AUSTRALIAN HAREBELL. *See* **Wahlenbergia gracilis.**

AUSTRALIAN MINT BUSH. *See* **Prostanthera.**

AUSTRALIAN PEPPER-TREE. *See* **Schinus molle.**

AUSTRALIAN RED BERRY or **SEA BERRY.** *See* **Ragodia.**

AUSTRIAN ROSE. *See* **Rosa lutea.**

AUTUMN TINTS. With landscape gardeners in particular, there has been a growing disposition evinced to include in their trees and shrubs a due proportion of such as "take on" Autumn Tints. They make most effective colour-pictures at a very sombre time of the year, and the foliage alike on the trees and shrubs and when cut is extremely decorative. The idea is worthy of extension, and all gardens large enough to give place to hardy shrubs and trees should contain some of those remarkable for the effect of their foliage in autumn.

The uses to which Autumn-Tinted foliage may be put are numerous. It forms a good setting for cut-flowers for various purposes. Sprays of Thorns with fruit, or sprigs of the popular Guelder Rose crowned with its glowing berries, are strikingly beautiful for placing in vases for table-decoration; while for harvest festivals, and for indoor decorative purposes, Autumn-Tinted foliage is well adapted.

The various forms of *Acer palmatum*, or *A. polymorphum*, as it is frequently called, exhibit an almost endless variety of leaf-colour. A fine colour-picture could be obtained by planting them in groups on sloping mounds—preferably facing south or west, due regard being paid to habit of plant, form and colour of leaf—with a suitable background of green-leaved subjects. The result would be a perfect panorama of colour in October which would baffle even the skilled artist to reproduce. The stately Beeches and noble Elms are picturesque, and in spring, when the first-named are mantling themselves with leaves of the tenderest green, or in autumn, when the colour changes to shades of russet brown and yellow, few trees are more pleasing to the eye. The Amelanchiers Virginian Creepers, *Rhus Cotinus*, *Nyssa sylvatica*, and *Parrotia persica*, are, when arrayed in their autumn colours, unequalled, much less surpassed, by the showiest foliage plant of our stoves.

The most highly-coloured tints are given by deciduous subjects, and although we do not, as a rule, look to evergreens with a great degree of expectation, still, some of them assume pleasing shades from October onwards; in fact, not a few reveal considerable beauty during the winter months.

A few of the subjects falling under the designation above adopted rank amongst the showiest of flowering and ornamental foliage shrubs and trees—*Eucryphia pinnatifolia*, for instance, with lovely pure white flowers and golden-yellow anthers, can scarcely be known too well, as it blossoms towards the latter part of July and August, when the majority of shrubs have given of their best. Its glossy green leaves, composed of several leaflets, are heavily tinged with orange and brown in October.

The Thorns (*Cratægus*), again, in autumn, and particularly those of the North American representatives, are charming pictures in red, crimson, yellow, and gold. *C. Crus-galli* is an exceedingly beautiful tree, whose leaves, after assuming various shades of bronze-green, irregularly margined with red, eventually die off a rich crimson. The variety *prunifolia* is equally remarkable and quite distinct by reason of its purplish-brown, claret, and orange-shadings. *C. splendens*, *C. arbutifolia*, and *C. ovalifolia* belong to the same group, and are characterised by

Autumn Tints—*continued.*

the crimson and scarlet hues of the decaying foliage. *C. pinnatifida*, from Northern China, is conspicuous for its peculiarly bronze-tinted leaves set on red petioles. *C. coccinea* is a charming tree in the landscape in autumn; its leaves, blotched with purple, hang on the trees until late in the season. *C. monogyna ramulis-aureis*, whose leaves are clear yellow in spring and summer, and heavily tinted with orange in September; also *C. tomentosa* and *C. mollis*, are all desirable.

Liriodendron tulipifera (Tulip-tree) has leaves which are distinct from those of all other trees; they are four-lobed and of a pleasing shade of green, which in autumn changes to yellow and orange. The North American Witch Hazel (*Hamamelis virginica*) is of value in the garden in early winter, when its decaying foliage is suffused with yellow.

The genus *Ribes* contributes its quota of glowing colours. *R. aureum* (Buffalo Currant), which makes such a pretty picture in spring, when its drooping, slender racemes of yellow flowers are displayed so abundantly, is equally beautiful in October, when its smooth, green, much-cut leaves change to shades of rose-pink. The variety *aurantiacum* is even showier than the type, the bright-tinted foliage being very striking. *R. prostratum* is from a colour point of view worthy of a place in the rock garden. Its large leaves, of various shades of green, are tinted and edged with red, and before they fall are almost wholly crimson. Flowering Currants should be planted in masses. *Kölreuteria paniculata* is very attractive towards the close of September, when the deep green foliage assumes brownish-orange and crimson tints. *Oxydendron arboreum* (Sorrel-tree) has lovely crimson leaves in autumn.

Enkianthus campanulatus is very showy in October, as its reddish-orange leaves are quite distinct; while if grown in a clear atmosphere its winter effect is very fine, as its bark is highly coloured. Some of the Spindle-trees (Euonymuses) stand out in bold relief in autumn time. The beauty of *E. europæus* as a berry-bearing shrub is known far and wide, as its orange-coloured berries and bright crimson capsules are very pleasing; but no less so are the orange and brown tints of its autumn foliage. The variety *atropurpureus* is deep purple in spring and summer, and heavily shaded with orange in autumn. *E. obovatus*, allied to *E. americanus*, is also noteworthy; the leaves die off shades of reddish-purple and yellow. The square-stemmed *E. alatus* is rich in its autumnal colouring. In autumn the Amelanchiers are aglow with rich and subtle shades of yellow, chocolate, and crimson. Perhaps the most useful and ornamental is *A. canadensis*. The variety *oblongifolia*, however, is conspicuous for its claret-coloured leaves, and forms a striking contrast to the type.

Pyrus arbutifolia is not only desirable for its gorgeous Autumnal Tints, but also for its red fruits. All the forms of *Pyrus Aria* (Beam-tree) are more or less beautiful, and worth planting in the park alike for their charming foliage and attractive berries. Either for growing in the open shrubbery, or for training against a wall 6ft. or so high, *Spiræa prunifolia fl. pl.* should be remembered. In autumn its small Plum-like leaves are deeply stained with purplish-crimson. The yellow-barked Ash (*Fraxinus excelsior aurea*) is not only conspicuous by reason of the golden-yellow shades of the decaying leafage, but in mid-winter its brightly-coloured bark lights up the landscape. The White Ash (*F. americana*) is lovely when its large leaves are shaded with brown and orange. *Cladrastis tinctoria* in summer has the leaves a pretty shade of pale green, which in autumn gives place to rich yellow.

Those who have seen *Parrotia persica* in the weak sunshine of an October day cannot readily forget the effect produced by its Hazel-like leaves, which assume the most brilliant shades of crimson and yellow. *Betula populifolia* makes a pretty picture, especially on a moonlight night, with its brownish-yellow leaves mingling with the green ones; while the white-barked

Autumn Tints—*continued.*

stem gives pleasing variety. The purple-leaved form of the European species also deserves mention, as its autumnal colouring is quite as distinct and pleasing as its spring tints. Although introduced nearly a century ago, *Clerodendron trichotomum* is by no means well-known, notwithstanding its acknowledged beauty and hardiness. When its blossoms have faded, the reddish-purple calyces stand out prominently, affording a pleasing contrast to the beautiful shades of chocolate-brown and orange assumed by the decaying foliage. *Nyssa sylvatica* has smooth green leaves, which turn to brilliant shades of crimson and claret in autumn. *Liquidambar styraciflua* (Sweet Gum-tree) has deeply-lobed leaves, which in a young state are glossy green, and in October purplish-crimson.

Æsculus Hippocastanum (Horse Chestnut) in autumn assumes pleasing shades of orange and brown, while the leaves of *Æ. flava* turn bright yellow. The Maples (*Acer*) are grand trees for the park and garden, and the following are particularly showy in autumn: *Acer rubrum* holds a high place amongst Autumn-Tinted trees, for in October its leaves and petioles turn to shades of crimson, orange, and yellow. *A. circinatum* is very attractive when its leaves are stained with crimson and scarlet in autumn. *A. tataricum* has small serrated leaves which die off a lemon shade. Then there are *A. t. Ginnala* (sometimes given specific rank), whose soft green leaves change to various shades of bronze, red, and crimson before they fall, the bright red petioles affording additional colour; *A. macrophyllum*, with its large divided yellow and gold leaves set on red petioles; and *A. pictum*, whose leaves change from green to different shades of orange, yellow, and brown.

Of the Norway Maple (*A. platanoides*) two varieties stand out prominently above all others—*Reitenbachii* and *Schwedleri*. The first-named differs from the type principally on account of its metallic-green leaves, which intensify in colour before they fall; while *Schwedleri* has bronze-green leaves, changing to gold and deep crimson as autumn approaches. The under-sides of the leaves are nearly old-gold colour. Another sort, *A. insigne*, is worthy of mention, as in autumn its leaves change to yellow. *A. Heldreichi*, a native of Eastern Europe, is also conspicuous in autumn, its yellow leaves contrasting strongly with its crimson foot-stalks. *A. japonicum aureum* is a grand tree, whose beauty is shown from the time its clear yellow leaves are unfolded in spring until they die off in October, when they are heavily tinted and margined with crimson. The variety *microphyllum*, with its deeply-cut leaves, assume delicate shades of crimson and orange. *A. j. vitifolium* stands out conspicuously on a sunny autumn day, when the deeply-cut leaves (not unlike some of the Vines) are a mass of crimson and gold. *A. laciniata* enriches the landscape with glowing shades of orange, scarlet, and crimson. *A. macrantha* is showy, with its small blood-red leaves and petioles and red stem.

The Cotoneasters are prized for their lovely berries, but *C. horizontalis* deserves special mention, as it is the most conspicuous member of the genus when its decaying leaves present such vivid shades of scarlet and crimson. *Carya tomentosa* (White Heart Hickory) arrests attention principally on account of its lovely golden-yellow leaves, composed of from seven to nine leaflets; it is, when properly placed, one of the most gorgeous of Autumn-Tinted trees. *C. porcina microcarpa* is equally beautiful, the decaying foliage being particularly bright. *Vaccinium corymbosum*, in October, is rendered attractive by reason of its brightly-coloured foliage, which is a lovely shade of red, not infrequently intermingled with various shades of green and brown. *V. padifolium* and *V. pennsylvanicum* are likewise showy in their Autumn Tints.

Dogwoods (*Cornus*) are represented in nearly all public parks and gardens by one or two sorts only. *C. alba*, with its red stems and variously-coloured Autumn Tints, is a well-known decorative shrub, especially for winter effect, and the variety, *Späthi*, one of the best of the variegated Dogwoods, is becoming fairly well-known, too. The leaves are a beautiful yellow, marked with pale green, which, in autumn, is shaded with lemon-yellow and splashed with red. *C. florida* has leaves heavily shaded and suffused with chocolate-brown and golden-yellow. *C. brachypoda variegata* (a silver variegated form) assumes a bronzy-yellow shade. *C. macrophylla* is variable as regards its tints, and sometimes its leaves are not so highly coloured as at others. The small yellowish-green leaves of *C. mas elegantissima* are very attractive in October, when irregularly margined with red. *Lonicera Maximowiczii* is about the only Honeysuckle conspicuous for its autumnal colouring—rich shades of yellow and lemon.

The Sumachs (*Rhus*) are handsome tropical-looking plants, which "take on" pretty Autumn Tints. *R. Cotinus* (Venetian Sumach) is very noticeable; its leaves, which are retained longer than those of most of its congeners, are very showy. *R. cotinoides* deserves special mention on account of the dazzling colours of the decaying foliage, which are unequalled by any hardy tree. The normal colour is soft green, which, in early autumn, changes first to bronze-green, and later on to the brightest and most striking shades of orange-scarlet. Glorious shrubs for effect are *R. glabra*, and its variety *laciniata*. The latter is superior to the type; it is a valuable addition to the sub-tropical garden, the leaf-colour in autumn being a mixture of orange, yellow, and red.

Viburnum Opulus (Guelder Rose) bears leaves which are heavily stained with crimson and brown. *V. plicatum*, *V. Lantana*, *V. nudum*, and *V. cassinoides* are also worthy of mention, too.

The Oak is more often associated with the park than with the garden. *Quercus coccinea* (Scarlet Oak) gives colour to the landscape in autumn and early winter which is equalled by few trees. The colour varies from bronze-green to deep crimson. *Q. heterophylla* is dull crimson; *Q. palustris* (Marsh Oak) changes to yellow and red; *Q. marilandica nana*, a small tree, colours finely in an open situation, the leathery leaves being bright green in summer and rich purple-brown in autumn; the large foliage of *Q. velutina* dies off rich crimson; and *Q. conferta* (Hungarian Oak), with its deeply-cut leaves, is gay in October when shaded with cinnamon, brown, and yellow.

Of Azaleas or, more correctly, Rhododendrons, the *mollis*, or *sinensis*, and *pontica* sections are particularly noteworthy in autumn. Barberries are principally planted for their flowers in spring and fruit in autumn; some of them are brilliant towards the close of the summer months, when the leaves are changing colour. *B. Thunbergi* is effective when its small leaves assume shades of orange, yellow, chocolate, and brown. Sprays are admirably adapted for mixing with cut-flowers. Another species—*B. concinna*—has tiny green leaves, glaucous on the under-sides, which turn to bright red. *B. virescens* should be planted freely; its leaves die off a reddish colour, and the red stems are effective in the shrubbery during winter. The decaying leaves of *B. angulosa*, a loose-habited bush, are conspicuous in October. *B. vulgaris* and the purple-leaved *foliis-purpureis* has foliage which is delightful from early spring to autumn. In a young state the leaves are deep purple, and ere they fall the colour changes to bronzy-purple. *B. Aquifolium* (Holly-leaved Barberry), an evergreen member of the genus, is a pleasing shrub at all seasons of the year, but particularly so in autumn and winter, when its summer greenery has given place to shades of bronze and brown, and in not a few cases to crimson and maroon. *Nandina domestica*, a delightful little shrub, has smooth compound leaves which are bright red in autumn, and not only are they amongst the first to change colour, but being persistent, remain attractive for a considerable time.

Autumn Tints—*continued.*

Sprays or leaves are effective when used in conjunction with flowers for table decorations.

Two Leucothoës are deserving of recognition—*L. Catesbæi* (*Andromeda Catesbæi*), bearing long, sharp-pointed, bronzy-purple leaves throughout the winter, and *L. recurva*, with purplish-scarlet leaves in autumn. *Gaultheria procumbens* (Partridge Berry) is a cheerful-looking evergreen, with leathery leaves heavily shaded with bronze and crimson in winter.

Now as to climbers. These should include *Actinidia Kolomikta*, an uncommon free-growing climber, which gives a good account of itself in autumn, as the decaying leaves are heavily shaded with yellow, thus forming a good contrast to the reddish-coloured footstalks. Although usually accommodated in unheated plant-houses, *Akebia quinata* is hardy—in the temperate parts of these isles, at all events. In a young state its leaves are glossy green, but with age become suffused with brownish-purple. There are perhaps no more popular climbers for draping ugly walls than the Virginian Creepers, which in October are the admiration of everybody by reason of the superbly varied leaf-colours. Certainly no climbers are grown so extensively in town gardens, notwithstanding that they are bereft of foliage for a considerable portion of the year. *Vitis quinquefolia* (*Ampelopsis hederacea*) and *Ampelopsis Veitchii*, now recognised as *Vitis inconstans*, are unquestionably the finest of self-clinging deciduous creepers. The leaves vary in both shape and size, but the autumn colouring is always brilliant—shades of crimson, chocolate, and orange. *V. Coignetiæ*, which has received a great deal of notice during the past few years, and *V. Thunbergi* are both glorious in their autumn dress. *V. Teinturier*, a purple-leaved form of *V. vinifera*, is very beautiful, and deserves special mention.

Ivies possess considerable autumn beauty when judiciously used. *Hedera Helix atropurpurea* (*H. nigra*) in the early stages has glossy green leaves, but as winter approaches the colour changes to a lovely shade of bronzy-purple, in which condition it remains until the following spring.

Conifers form an interesting group. The colour of some intensifies in autumn and winter, and *Cryptomeria japonica elegans* will at once occur as a typical example. Then there is *Retinospora ericoides*—now merged into the *Thuia* group—whose small sharply-pointed leaves are heavily shaded with violet from autumn to spring. The majority of the Biotas and Thuias also arrest attention in winter on account of the variously-coloured foliage.

Two deciduous sorts stand out prominently amongst autumn-coloured trees—the Golden Larch (*Pseudolarix Kæmpferi*), with clusters of soft green leaves which change to golden-yellow in the early part of October, and *Taxodium distichum* (deciduous Cypress) which, from a colour point of view, is most conspicuous in its autumn dress, although it is very elegant in spring, when its feathery foliage is being moved by a gentle breeze. Before the leaves fall the colour becomes dull red and yellow, and if near enough to be reflected in water on a sunny day the effect is superb.

AVENUES. In forming an Avenue among the chief mistakes made are planting the trees in unsuitable soil, and not giving sufficient space between each specimen to allow of its individual character being displayed to advantage. Every Avenue should, if possible, be terminated with some definite object—for instance, a pagoda, tower, open scenery, &c. Then, again, the width of the Avenue, as well as the amount of room between the trees, should be well considered beforehand. The kind of tree employed must of course decide this, as it would be absurd to allow such things as Robinias (Acacias) the same amount of space as Limes, Chestnuts, or Elms. On low-lying wet soils it would be an advantage to plant on slightly-raised mounds, providing for drainage by means of broken bricks, stones, and such-like material.

Avenues—*continued.*

The value and beauty of the Horse Chestnut as an Avenue tree have been exemplified on many estates in this country, and the noble examples in Bushey Park, near Teddington, are of world wide repute. Although hardy, it should always be planted in sheltered positions, as its branches, being very heavy, are apt to split and fall off in rough weather. *Fagus sylvatica*, although not largely employed as an Avenue tree, deserves mention. It stands boisterous weather well, succeeds best in moist soil, and an Avenue of shapely trees is effective. It is an advantage to transplant the Beech frequently in a young state, so as to encourage as many fibrous roots as possible. An Avenue of the purple-leaved variety would not be so attractive as one composed entirely of the type, as the colour seen in the mass would be too heavy. Used with discretion in the park, it is, however, capable of producing splendid effects.

The fragrant Lime is a cherished Avenue tree; and rightly so, for it is well adapted to such a form of culture. A moist, well-drained soil answers admirably, as when planted in very dry land it loses a large number of leaves prematurely, especially in hot, dry seasons. The autumn-tinted foliage is very attractive. The Plane-tree (*Platanus acerifolia*) is familiar to everybody as the best of all trees for town planting. Vigorous, free in growth, and thoroughly hardy, it succeeds in all soils and positions. The Acacia is also a grand tree for towns, but unfortunately not used so much as it might be. In some respects it is superior to the last-named, as it is not so vigorous, stands hard pruning better, and may be employed with better effects in restricted areas. The foliage is a rich and pleasing shade of green. For small Avenues, *Acer Negundo* is well adapted, and *Liquidambar styraciflua* also merits attention for Avenues where the larger-growing sorts would be out of place. *Liriodendron tulipifera* grows freely, and forms a noble tree with a tall erect stem, and spreading branches supplied with deep green four-lobed leaves.

Several Elms (*Ulmus*) are serviceable Avenue trees, and the large-leaved English is one of the best. The upright-habited variety is worthy of extended culture. For general purposes the Atlas Cedar (*Cedrus atlantica*) is much better and hardier than *C. Deodora*, which is often employed as an Avenue tree.

For long and very broad Avenues *Quercus Ilex* answers well. The best specimens are produced in moist, deep soils, and when thoroughly established they grow freely. *Q. Turneri* is another ornamental Oak of free growth. *Abies brachyphylla*, a somewhat rare Japanese species, makes a handsome Avenue tree, but it requires good soil and shelter from north and east winds. *A. Nordmanniana* is perhaps the best of all the Silver Firs for decorative purposes; it succeeds in all soils and exposed situations. *A. Douglasii*, now botanically recognised as *Pseudotsuga Douglasii*, is a grand tree, with its tall stem, horizontal branches, and lovely foliage. *Picea pungens glauca* is a particularly showy and thoroughly hardy Conifer. It is of excellent growth in good soil, with an erect stem and stout branches.

Cryptomeria japonica is an upright-growing tree, whose stem is covered with rough brown bark. Protection from biting winds and an open soil should be secured for it. *Thuia gigantea*, a vigorous North American Conifer, also makes a suitable Avenue tree. It has an erect trunk, short branches, and deep green leaves. *Pinus excelsa*, *P. Strobus*, and *Wellingtonia gigantea* (under favourable conditions) are also serviceable Avenue trees. *Araucaria imbricata* has been planted extensively as an Avenue tree, as well as a lawn and park tree. It is sometimes made to cut ridiculous figures in the front gardens of many suburban villas. To see the true beauty of this peculiar tree, rich soil and a clear atmosphere are necessary. Its value as an Avenue tree has, however, been over-estimated.

AVERRHOA. Only the two species described are included in this genus. They are indigenous in tropical Asia. Flowers small, cymulose, regular; sepals five, imbricated; petals five, hypogynous, twisted; stamens ten; cymes in short panicles. Leaves alternate, imparipinnate, exstipulate. *A. Bilimbi* is known as the Cucumber-tree.

AVERRUNCATOR. This useful implement is better known as the Standard Tree Pruner, and is in use in most gardens where tall trees have to be pruned. Probably the best is that made by the Standard Tree Pruner Co., Derby, as it is easy to work and handle, making clean cuts. It is made in various sizes, and considerably economises labour.

AVICENNIA (named in honour of Avicenne, a celebrated Arabian philosopher and physician, 980-1037). SYNS. *Bontia* (of Linnæus), *Donatia*, *Halodendron* (of Thouars), *Sceura*, *Upata*. ORD. *Verbenaceæ*. A small genus (three or four species) of glabrous or canescent, stove shrubs, broadly dispersed over the sea-shores of the warmer parts of the globe. Flowers small, sessile, in contracted, head-like, pedunculate cymes; calyx five-parted; corolla limb five-cleft; stamens four; bracts shorter than the calyx. Leaves opposite, entire, coriaceous. *A. nitida* and *A. officinalis* are occasionally grown in Continental gardens, but they have little decorative value.

AWN. A bristle-like appendage; *e.g.*, those on the glumes of many of the Grasses.

AXE-WEED. *See* **Securigera Coronilla.**

AYENIA (named in honour of the Duke d'Ayen). SYN. *Cybiostigma*. ORD. *Sterculiaceæ*. A genus comprising eight species of stove herbs or sub-shrubs, natives of the warmer parts of America. Flowers small, pedicellate, fascicled or cymose; calyx five-parted; petals five. Leaves serrated. *A. lævigata* and *A. pusilla* have been introduced, but are probably no longer in cultivation.

AYRSHIRE ROSE. *See* **Rosa repens hybrida.**

AZALEA. This genus is now included by the best authorities under **Rhododendron.**

Thrips, Red Spider, and most of the other animal pests to which Azaleas are liable are now best got rid of by means of the XL All Vaporiser. This may be used without the least injury to the tender foliage. More troublesome to the cultivation of Azaleas indoors is, however, bud-dropping, which usually follows if the plants do not receive a sufficiency of moisture at the roots.

To the species, varieties, and hybrids described on pp. 149-50, Vol. I., the following should be added:

A. balsaminæflora alba (white). *fl.* white, produced in large, compact trusses, and lasting a long time in perfection.

A. b. aurea (golden). A form differing from *alba* in its bright yellow flowers.

A. b. carnea (flesh-coloured). *fl.* flesh-coloured, tinted with rose, and also with pale yellow when first expanded. 1887.

The preceding are garden hybrids raised from a Javanese species.

A. dianthiflora (Dianthus-flowered). *fl.* of a rose or violet colour, dotted with brown, sweet-scented; calyx lobes long, pubescent; corolla 3in. in diameter; pedicels tomentose. May and June. *l.* rather large, elliptic-oblong, softly hairy. Japan, 1889. A vigorous, free-flowering, hardy shrub.

A. hybrida Daviesii (Davies' hybrid). *fl.* white. 1893. A garden hybrid, supposed to have originated by crossing *A. sinensis* with *A. viscosa*. (R. G. 1387.)

A. nitida (shining). A form of *A. viscosa*.

A. obtusa (blunt). *fl.* deep red, solitary; segments of the corolla nearly oval and sharp-pointed, the upper one not much smaller than the others, and faintly blotched purple. March. *l.* pilose, oblong, obtuse, narrowed at base. *h.* 2ft. China, 1844. Greenhouse evergreen. (B. R. xxxii. 37; G. C. n. s., xxv., p. 585.)

A. o. alba (white). A variety differing from the type only in the colour of its flowers, which are white, occasionally striped red. 1887.

A. occidentalis (Western). *fl.* rather unpleasantly scented, produced when the leaves are almost fully developed; corolla white or rarely having a slight rosy tinge and a pale yellow band on the upper lobe, often 2½in. long. *l.* obovate-oblong, 1in. to 3in. long, nearly glabrous at maturity, but ciliated, thickish. *h.* 2ft. to 6ft. California.

A. rhombica (rhomboid-leaved). *fl.* usually in pairs; calyx minute; corolla bright rose, 1½in. to 2in. across, sub-bilabiate. May. *l.* sub-conical, 1½in. to 2in. long, assuming a bronzy hue in autumn, the young ones silky, rhombic-elliptic, acute at both ends, hairy above, finely reticulated beneath. Branches slender, stiff, glabrous, the young ones strigose-tomentose. Japan. A much-branched, hardy shrub. SYN. *Rhododendron rhombicum* (B. M. 6972).

A. rustica (rustic). This name has been applied to a garden race, said to be derived from *A. sinensis* (*mollis*) and *A. occidentalis*. 1893.

Indian Azaleas. The following new varieties in the various sections may be recommended:

Azalea indica.—*Double-flowered*: BARONNE ROTHSCHILD, rich purple; very fine. BERNARD ANDRE ALBA, pure white, large; semi-double. BIGNONCE FLORE PLENO, lovely rose, imbricated, large flower; very handsome. COMTE D'HAINAULT, rich salmon-pink, upper petals spotted with dark maroon; very large. DEUTSCHE PERLE, pure white; one of the finest of all varieties, very early, and forces well. EMPRESS OF INDIA, rosy-salmon; pretty and free. NARCISSIFLORA, pure white; a useful winter-flowering variety. QUEEN OF DOUBLE WHITES, pure white; fine. VERVAENEANA, salmon, margined with white; large and handsome.

FIG. 138. AZALEA INDICA.

Single-flowered (See Fig. 138): ALBA DELICATISSIMA, white; the foliage of this variety is richly variegated. AMI CHARLES VERMEIRE, crimson, with spots of a deeper shade on the upper petals; of excellent form and substance. APOLLO, white, striped with carmine; a large and splendid variety. BEAUTY OF SURREY, pure white; a fine variety of good form. GRANDIFLORA ALBA, pure white; one of the largest and best of the new varieties; GRANDIS, brick-red; an excellent variety. HERCULES, rosy-crimson, with dark blotches on upper petals; very large. MADAME JEAN NUYTENS VERSCHAFFELT, soft satiny white, slightly tinged with yellow at the margins; a large and lovely variety. STELLA, rich orange-scarlet, tinged with violet on the upper petals; a splendid large flower.

Azalea pontica.—ADMIRAL DE RUYTER, reddish-scarlet; AUGUSTE MECHELYNCK, white; BEAUTE CELESTE, bright rose; BIJOU DES AMATEURS, rose; BOUQUET DE FLORE, salmon; CARDINAL, flesh colour; COCCINEA SPECIOSA, deep orange; DAVIESII, white; FAMA, rose, shaded with yellow; GLORIA MUNDI, vermilion; HEUREUSE SURPRISE, pure white; IGNEA NOVA, carmine; MINERVA, rosy-salmon; NANCY WATERER, a lovely yellow; PALLAS, rose-magenta; PUCELLE, light violet; PRINCESS ADRIENNE, deep red; QUEEN VICTORIA, deep rose; UNIQUE JAUNE, deep yellow; and WILLIAM III., orange.

Azalea rustica flore pleno.—AIDA, rose, spotted with yellow; ARIADNE, white, shaded with rose; FREYA, whitish mauve, shaded with yellow; HORA, nankin yellow; IL TASSO, light red; MÉCÈNE, white, marked with rose; PHIDIAS, light rose,

Azalea—*continued.*

shading to deep yellow; VELASQUEZ, creamy-white, shaded with rose; VIRGILE, pale yellow.

Azalea sinensis (SYN. *A. mollis*).—ALBICANS, pure white; ALPHONSE LAVALLEE, reddish-orange; BARON EDMOND DE ROTHSCHILD, red; BARON PIGCKE, deep red; CHEVALIER DE REALI, bright light yellow; COMTE DE GOMER, rosy-orange; COMTE DE QUINCEY, golden-yellow; ERNEST BACH, red; ISABELLA VAN HOUTTE, clear nankin; KÖNIGEN SOPHIA, orange suffused with rose; PROFESSOR W. KOSTER, red; and W. E. GUMBLETON, nankin.

Azalea sinensis Hybrids.—CHARLES ROGIER, bright rose; DULCINÉE, reddish-orange; EDISON, rose; FRERE ORBAN, creamy-yellow; GENERAL BRAILMONT, rosy-lilac; GLOIRE DE BELGIQUE, lovely red; J. J. DE VINT, pale orange, immense truss; M. DESBOIS, salmon; SOUVENIR DE LOUIS VAN HOUTTE, white, tinged with rose.

AZALEASTRUM ALBIFLORUM. A garden synonym of **Rhododendron albiflorum** (which *see*).

AZALEODENDRON (a compound of the names *Azalea* and *Rhododendron*). ORD. *Ericaceæ*. This name has been applied to so-called bigeneric hybrids between *Azalea sinensis* (*mollis*) and some varieties of *Rhododendron*. They should properly be classed under *Rhododendron*, in which genus Bentham and Hooker include *Azalea*.

AZARA. About a dozen species, all natives of Chili, are included in this genus. Flowers hermaphrodite, fascicled, shortly corymbose, or somewhat spicate; sepals four or five and somewhat valvate, or five or six and imbricated; petals wanting; stamens indefinite.

AZEREDIA. A synonym of **Cochlospermum** (which *see*).

AZIMA (from *Azimena*, the Malagasy name of an allied shrub). SYN. *Monetia*. ORD. *Salvadoraceæ*. A small genus (three or four species) of stove or greenhouse, much-branched or sarmentose shrubs, natives of tropical Asia, tropical and South Africa, and Madagascar. Flowers small, dicœcious, crowded in the axils or in panicles at the sides of the branches. Leaves opposite, entire. *A. tetracantha* (SYN. *Monetia barlerioides*) has been introduced, but is probably lost to cultivation.

AZOLLA (from *azo*, to dry, and *ollo*, to kill; a dry condition causes the plants to perish). ORD. *Rhizocarpeæ*. A genus embracing five species of stove or greenhouse, fugacious, floating aquatics, with copiously-branched stems, natives of North and South America, Australia, and New Zealand. Leaves sessile, minute, densely imbricated, deeply lobed, each lobe furnished with a midrib only. Stems sending out from the under-side into the water copious simple or feathery, solitary or fascicled root-fibres; branches bearing two kinds of fruit on the under-side (which, however, is not usually seen in this country). The only species in cultivation is best accommodated during the winter in shallow vessels in a pit or warm house, or frame; but in the summer it will thrive in a small indoor aquarium, or the vessel in which it grows may be placed outside, and at this season acquires a rich reddish-purple tint.

A. caroliniana (Carolina). *fronds* ¼in. to 1in. long. *l.* generally pale green, the larger lobes rhomboid-oblong, obtuse. Root-fibres solitary. Southern United States to Buenos Ayres.

BABIANA. The species number nearly thirty. To the information given on p. 152, Vol. I., the following should be added:

B. disticha is scarcely more than a variety of *B. plicata*, from which it differs by its perianth-tube being distinctly exserted from the spathe (J. G. Baker).

B. reflexa is a form of *B. stricta* with flowers smaller than in the type, the lower ones deflexed.

B. socotrana (Socotran). *fl.* solitary, almost sessile; perianth tube 1¼in. long, very slender, the limb pale violet-blue, 1in. broad, two-lipped, the segments elliptic, acute. September

Babiana—*continued.*

l. bifarious, 3in. to 4in. long, ¾in. broad, narrow-lanceolate; petioles broad, compressed. *h.* 3in. to 4in. Socotra, 1880. (B. M. 6585.)

B. stricta. *B. villosa* (B. M. 583) is synonymous with this species.

BABINGTONIA. Bentham and Hooker include this under **Bæckea** (which *see*).

BACAZIA. Included under **Barnadesia** (which *see*).

BACCAUREA (from *bacca*, a berry, and *aurea*, golden; in allusion to the golden berries of some of the species). SYNS. *Adenocrepis*, *Calyptroon*, *Microsepala*, *Pierardia*. ORD. *Euphorbiaceæ*. A genus embracing upwards of thirty species of stove trees, natives of India, the Malayan Archipelago, and the Pacific Islands. Flowers racemose, on short pedicels. Fruit ovoid, obovoid, or sub-globose. Leaves alternate, entire or lightly undulate-crenate. *B. bracteata* (SYN. *Pierardia dulcis*) has been introduced, but is probably no longer grown in this country.

BACCHARIS. SYN. *Molina*. Upwards of 275 species, all American, have been referred to this genus. To that described on p. 152, Vol. I., the following should be added:

B. salicina (Willow-like). *fl.-heads* pedunculate. *l.* like those of a Willow, sub-sessile, varying from oblong to linear-lanceolate, sparingly toothed, rarely entire. *h.* 6ft. Western North America, 1894.

B. trimera (three-parted). *fl.-heads* inconspicuous. *h.* 6ft. Argentina, 1896. A leafless, greenhouse shrub, with winged expansions along the stems. It is more curious than ornamental. (R. H. 1896, p. 152, f. 50-52.)

BACTERIA. These microscopic vegetable organisms, though popularly associated with certain diseases peculiar to man and other animals, are also responsible for several very destructive plant diseases, which are grouped under the heading of "Bacteriosis." Hartig, in his "Diseases of Trees," says that such diseases are characterised by the succulent parts of the infested plant being converted "into a slimy, glutinous pulp, which emits a most repulsive stench." Bacteria increase very rapidly by either fission or by spores. The first is really a process of self-division. It consists of a gradual division of the body into two parts, each of which then becomes a separate and independent organism. Dutch bulb growers are only too well aware of the appearance of Hyacinths so attacked by the yellow, slimy disease, found alike in the resting and active stage, and known as *Bacterium* (*Bacillus*) *hyacinthi*. Tomatoes are subject to a virulent form of Bacteriosis, in which the fruits are blackened. So also are Cabbages. In the latter case, Dr. Erwin Smith (of the United States Department of Agriculture) says the symptoms usually begin at the margins, and consist in the yellowing of all affected parts except the veins, which become decidedly brown or black. Carnations, again, are affected. A number of other plants not grown in this country are thought to be affected by these low organisms, but the whole question of Bacteria in their relation to plants requires further investigation before anything can with certainty be said.

BACTERIOSIS. *See* **Bacteria.**

BACTRIS. About a hundred species of this genus, all natives of tropical America, have been enumerated. To those described on p. 153, Vol. I., the following should be added:

B. acanthocarpa (spiny-fruited). *fl.*, spadix about 1½ft. long. *fr.* scarlet, globose or depressed-globose, armed with long, black, shining prickles. *l.* 6ft. to 8ft. long, scattered on the upper part of the stems, spreading; pinnæ rather loosely disposed, linear, long-acuminate, 1½ft. long. Stems often densely tufted, erect, 12ft. to 15ft. high, very prickly. Brazil. There is a variety *crispata*.

B. elatior (taller). This "may belong to *B. trichospatha*, with which it agrees in habit, but from which it differs in the regular arrangement and smaller number of the pinnæ, in the arrangement of the branches of the spadix, the rachis being represented

Bactris—*continued.*

long, while in *trichospatha* it is short or nearly wanting" ("Journal of Botany," xv., p. 42). Brazil.

B. Gasipaés (native name). A synonym of *Gulielma speciosa.*

B. simplicifrons (entire-leaved). *fl.*, spadix simple, 1in. to 2in. long, nodding; inner spathe as long as the spadix, glabrescent. *l.* bifid, the two divisions oblong, entire, curved, acute, 10in. to 12in. long, 2½in. to 3in. broad, broadly adnate at the flat base, diverging in an acute angle. Trunk 3ft. to 6ft. high. West Indies, &c. Plant devoid of prickles except at the tips of the leaves.

B. trichospatha (hairy-spathed). *fl.*, outer spathe pubescent, inner one almost woody; spadix 8in. to 14in. long. *fr.* blackish-violet, globose, ½in. in diameter. *l.* 4ft. to 7ft. long, interruptedly pinnate; leaflets all on the same plane, lanceolate, slightly falcate, long-acuminate, pale beneath. Caudex dwarf, unarmed or prickly. Brazil.

BACULARIA. SYN. *Linospadix.* Flowers green, monœcious on the same spadix; spadices numerous, very slender, simple, longer than the leaves; spathes two, remote. Fruit green, ¼in. to ½in. long. Leaves terminal, unequally pinnatisect; segments cut or toothed at apex. To the species described on p. 153, Vol. I., the following should be added:

B. Micholitziana (Micholitz'). *l.* oblong; leaflets remote, linear-oblong, acute, paler on the under-surface. Caudex and rachis furnished with scattered spines, which are thickened at the base. New Guinea, 1898. A very elegant Palm in a young state. SYN. *Ceratolobus Micholitziana* (G. C. 1893, xxiii., p. 251; R. H. 1898, p. 263).

B. Petrickiana (Petrick's). A very elegant, pinnate-leaved species, as yet very rare in cultivation. New Guinea, 1898. SYN. *Linospadix Petrickiana* (G. C. 1898, xxiv., p. 299, f. 87).

BADAMIA. Included under **Terminalia** (which *see*).

BÆA. About seven species are included in this genus; they are found in Eastern Asia, the Malayan Archipelago, Australia, and the Seychelles. Flowers blue, on axillary peduncles or elongated, leafless scapes; calyx five-parted or deeply five-cleft; corolla tube short, the limb somewhat bilabiate; perfect stamens two. Leaves radical, or those on the stems short and opposite, ovate or oblique.

BÆCKEA. Bentham and Hooker include **Babingtonia** (which *see*) under this genus; it embraces nearly fifty species, mostly Australian, a few being found in the Indian Archipelago and in New Caledonia.

BAEL-TREE. *See* **Ægle Marmelos.**

BÆOBOTRYS. A synonym of **Mæsa** (which *see*).

BÆOMETRA (from *baios*, small, and *metron*, size, in allusion to the size of the plant). SYNS. *Jania*, *Kolbea.* ORD. *Liliaceæ.* A monotypic genus. The species is a greenhouse, bulbous plant, thriving in a compost of sandy loam and peat, and increased by seeds or by division.

B. columellaris (Columella-like). *fl.* one or few in a simple raceme, shortly pedicellate; perianth red outside, yellow within, with a black spot at the base of the blade. June. *l.* several, dry, persistent, firm, the lower ones 6in. to 9in. long, stem-clasping, the upper ones gradually smaller. Stems simple, 6in. to 12in. high. South Africa, 1787. SYN. *Melanthium uniflorum* (B. M. 767).

BÆRIA. SYN. *Burrielia* (in part). The species are all Californian. Flower-heads yellow, heterogamous, radiate, at the tips of the branches or long-pedunculate or axillary; involucral bracts in one or two series; receptacle conical. Leaves opposite, linear, entire, pinnatifid or pinnately cut. To the species described on p. 153, Vol. I., the following should be added:

B. gracilis (slender). *fl.-heads* solitary, having ten to twelve rays and involucral bracts, or when depauperated five or six, the former nearly ½in. long. Summer. *l.* linear, entire. *h.* 6ft. to 10ft. 1887. A hardy annual, branching from the base. (R. G. 1887, p. 392.) SYN. *Burrielia gracilis* (B. M. 3758).

BAHIA. SYN. *Trichophyllum.* Including *Eriophyllum.* There are about a score species of greenhouse or hardy under-shrubs in this genus, all American. Flower-heads yellow, heterogamous, radiate; involucre flat, naked or foveolate. Leaves opposite or alternate, dissected or lobed,

Bahia—*continued.*

or the upper ones entire. To the species described on p. 154, Vol. I., the following should be added:

B. confertiflora (cluster-flowered). *fl.-heads* disposed in small, dense, corymbose cymes; ray florets four or five. *l.* small, mostly of cuneate outline, pinnately or somewhat ternately once or twice three- to seven-parted into narrow-linear divisions. Stems naked at summit. *h.* 1ft. to 2ft. North America, 1888. An ornamental, white-woolly, hardy under-shrub. (R. G. 1888, p. 329, t. 1275, f. i.) SYN. *Eriophyllum confertiflorum.*

BAKED. This term is applied to soil which has become set or hardened on the surface by the action of sun and wet. The condition is very noticeable where the soil is clayey or a mixture of clay and sand. Soil should be prevented from baking in a garden by the frequent use of the Dutch hoe in dry weather. Farmyard manure will also act mechanically on the soil; while road-scrapings, ashes, or any other material that will lighten the soil and render it more friable, are beneficial.

BAKERIA (named in honour of John Gilbert Baker, F.R.S., F.L.S., an eminent botanist, author of the "Handbook of the *Bromeliaceæ*," and numerous other works). ORD. *Bromeliaceæ.* A monotypic genus. The species is a stove or warm greenhouse, stemless plant, requiring similar culture to **Tillandsia** (which *see*).

B. tillandsioides (Tillandsia-like). *fl.* rosy-purple, about ½in. in diameter, rather pretty; petals much longer than the sepals; inflorescence a loose panicle, 1ft. long, with ascending or spreading, racemose branches; peduncle slender, about as long as the leaves. September. *l.* densely rosulate, spreading, ensiform, acuminate, 6in. to 8in. long, ½in. broad. Probably Brazil. (R. H. 1889, p. 84.)

BAKERIA (of Seemann). Included under **Pleurandra** (which *see*).

BALAKA (probably a native name). ORD. *Palmæ.* A small genus of stove Palms. *B. perbrevis* and *B. Seemanni*, both natives of Fiji, are included in the Kew Collection, but they are not in general cultivation.

BALANOPHOREÆ. A natural order embracing about thirty-five species (in fourteen genera) of fleshy, parasitic herbs, of botanical interest, allied to the *Euphorbiaceæ.*

BALANOPSEÆ. A small natural order (six or seven species, in one genus) of New Caledonian trees or shrubs, of botanical interest, allied to the *Urticaceæ.*

BALANOPTERIS. A synonym of **Heritieria** (which *see*).

BALANTIUM (of Kaulfuss). Included under **Dicksonia** (which *see*).

BALBISIA. SYN. *Cruikshanksia* (of Hooker). According to the "Index Kewensis," this genus includes three species; they are of stove under-shrubs, natives of Chili and Peru. Flowers yellow, showy, terminal, solitary, regular; sepals five, imbricated; petals five, hypogynous, twisted; stamens ten, free. Leaves opposite or alternate, often three-parted, without stipules.

BALBISIA (of Willdenow). A synonym of **Tridax** (which *see*).

BALFOURIA. A synonym of **Wrightia** (which *see*).

BALLOTA (*Ballote* is the Greek name of our native *B. nigra* [Black Horehound], and is said to be derived from *ballo*, to emit; in allusion to its rejection by cattle on account of its disagreeable smell). ORD. *Labiatæ.* A genus embracing about twenty-five species of greenhouse or hardy, perennial herbs, or under-shrubs, mostly found in the Mediterranean region; one is broadly dispersed over Europe and Western Asia, and one is South African. The species are of no horticultural value. *B. suaveolens* is now classed under **Hyptis** (which *see*).

BALSAM, GARDEN. *See* **Dianthera pectoralis.**

BALSAM, POPLAR. *See* **Populus balsamifera.**

BALSAM, SEASIDE. *See* **Croton Eluteria.**

BALSAM, WATER. *See* **Tytonia natans.**

BALSAMIFLUÆ. Included under **Hamamelideæ** (which *see*).

BALSAMINA. A synonym of **Impatiens** (which *see*).

BALSAMITA. This genus is included by Bentham and Hooker under **Chrysanthemum** (which *see*).

B. vulgaris (common). A synonym of *Tanacetum Balsamita.*

Bambusa—*continued.*

the dead leaves that have settled in the centre cleared away so as to allow a free circulation of air. An annual mulching of well-rotted manure or good leaf-mould will be of great benefit in adding vigour to the plants. Bamboos are the most charming of all plants for sub-tropical bedding, and for planting as isolated specimens on the lawn they have few equals. To those described on pp. 155-6, Vol. I., the following should now be added. For a full account of this and allied genera the reader is referred to A. B. Freeman-Mitford's monograph, entitled "The Bamboo Garden" (London, 1896). *See also* **Arundinaria** and **Phyllostachys.**

FIG. 139. BAMBUSA PALMATA.

BALSAMODENDRON. SYNS. *Commiphora, Heudelotia.* About half-a-dozen species, natives of Arabia, tropical and South Africa, and the East Indies, are referred to this genus.

B. zeylanicum is now classed under **Canarium.**

BAMBOO PALM. *See* **Rhaphia tædigera.**

BAMBOS. A synonym of **Bambusa** (which *see*).

BAMBUSA. SYNS. *Bambos, Ischurochloa.* About two dozen species have been referred to this genus, natives of tropical or sub-tropical Asia, one being broadly dispersed through tropical America. Bamboos should never be exposed to cold east winds, as these are far more injurious, especially when growth is tender, than severe frosts. The soil best suited to their development is a sandy loam, enriched with cow-manure and leaf-mould. In very dry soils Bamboos make but little growth, and in very hot and dry summers the foliage is apt to turn a rusty brown, and fall off prematurely. The plants should be examined in spring, and

B. angustifolia (narrow-leaved). *l.* 2in. to 4½in. long, ¼in. broad, tessellated, serrated on both edges, tapering to a fine point, pinched in about ¼in. from the end, sometimes striped with white. Stems 1ft. high, ¼in. thick, light green, shading to purple; branches solitary or in pairs, much longer than the internodes. China and Japan. A charming little species. SYN. *B. Vilmorini.*

B. Castillonis (Castillon's). *l.* 7in. long, 1½in. broad, serrated, variegated. Stems square, curiously variegated; one side of each internode is dark green, and the other side yellow, these colours alternating at the next internode. *h.* 6ft. Japan, 1886. Hardy. (R. H. 1886, p. 513.)

B. chrysantha (golden-flowered). *l.* 7in. long, 1½in. broad, striped with yellow, slightly glaucous beneath. Stems slender, 3ft. or more in height. Japan. This is probably a form of *Arundinaria Simoni.*

B. disticha (two-ranked). *l.* borne alternately in two vertical ranks all along the stems and branches, lanceolate, bright green, tessellated, serrated, 1⅜in. to 2¼in. long, ¼in. broad. Stems 2ft. high, zigzagged, rarely clouded with purple; sheaths downy at first; branches solitary. Japan (?). SYN. *B. nana* (of gardens).

B. erecta (erect). A synonym of *Arundinaria Hindsii.*

B. fastuosa (proud). *l.* 5in. to 7in. long, ¾in. to 1in. broad, sharp-pointed, constricted 1in. from the tongue-like end,

Bambusa *continued*

serrated, closely tessellated, brilliant green above, glaucous beneath; petioles long and well-defined. Stems 12ft. to 15ft. high, more than 3in. thick, very hollow, heavily blotched with purplish-brown; branches very numerous (sometimes eight to one node) and again ramified; sheaths of a beautiful purple outside, deep claret within. Japan, 1895.

B. gracilis (slender). A garden name for *Arundinaria falcata* and *A. Falconeri.*

B. graminea (Grass-like). A garden synonym of *Arundinaria Hindsii graminea.*

B. Henonis. *l.* narrow, 2in. to 3in. long. Stems 7ft. to 9ft. high. This is described "as one of the most beautiful of the genus, and one of the hardiest, bearing equally well the drought of summer and the ice of winter."

B. Hermanni (Hermann's). A garden synonym of *Arundinaria macrosperma.*

B. Kan-chiku (native name). A synonym of *B. marmorea.*

B. Laydekeri (Laydeker's). *l.*, largest ones about 6in. long and ⅝in. broad, tapering to a fine point, dark green, with a poor, paler variegation, tessellated, more serrated on one edge than on the other. Stems 3ft. or more in height, about ½in. thick, stained with purple; nodes prominent, 3in. to 4in. apart; branches almost whorled on the upper nodes. China and Japan. Not a handsome species; dies after flowering.

B. macroculmis (large-stemmed). A synonym of *B. arundinacea.*

B. marmorea (marbled). *l.* bright green, 4½in. long, ⅝in. to ¾in. broad, serrated, prettily tessellated, constricted about ½in. from the sharp point. Stems 3ft. or more in height, purple, solid throughout; internodes 1½in. to 2in. long; sheath purple, marbled with pinkish-grey; branches borne in threes. China and Japan. An ornamental species. SYN. *B. Kan-chiku.*

B. Maximowiczii (Maximowicz's). A garden synonym of *Arundinaria Simoni striata.*

B. Metake is a synonym of *Arundinaria japonica.*

B. Nagashima (native name). *l.* sometimes 5½in. long and ⅝in. broad, tessellated, serrated, bright green, finely pointed, pinched towards the top. Stems round, slender, purplish-green, 1ft. to 1½ft. high; main branches borne singly, but the branchlets in twos and threes. Japan.

B. nana (dwarf), of gardens. A synonym of *B. disticha.*

B. Narihira (native name). A synonym of *Arundinaria Simoni.*

B. Neumanni (Neumann's). A synonym of *Arundinaria macrosperma.*

B. palmata (palmate). *l.* 12in. to 13in. long, 3in. to 3½in. broad, tapering to a fine point, pinched in about 1in. from the end, very sharply serrated, conspicuously tessellated, brilliant green above, glaucous beneath; petioles stout. Stems about 5ft. high, 1in. thick, bright green with a waxy bloom. China and Japan. See Fig. 139.

B. palmata, of gardens. A synonym of *B. tessellata.*

B. plicata (folded). A synonym of *Arundinaria Simoni striata.*

B. pumila (dwarf). *l.* 4½in. long, ⅝in. broad, covered with short hairs. Stems less than 3ft. high, unbranched. Japan, 1894.

B. pygmæa (pigmy). *l.* 5in. long, ⅝in. broad, brilliant green, regularly tessellated, serrated, the upper surface bristling with little teeth, the lower downy; petioles well defined. Stems 6in. to 12in. high, with prominent nodes. Japan. A dwarf but very rampant species.

B. quadrangularis (four-angled). *l.* deep green, 8in. long, 1in. broad, serrated, minutely tessellated, lanceolate, pinched in about 1in. from the point, tapering to a short petiole. Stems 12ft. to 30ft. high, ¾in. thick, quadrangular, having a deep purple band on the lower side of each node; branches six or seven to a stem. China and Japan. Rare in cultivation.

B. Ragamowskii. The correct name is *B. tessellata.*

B. senanensis (a geographical name). *l.* ovate, 6in. long. Stems about 1ft. high, thin, erect. Japan, 1894. A hardy species, considered by Mr. Freeman-Mitford to be identical with *Arundinaria Veitchii.*

B. Simonii is synonymous with *Arundinaria Maximowiczii.*

B. sterilis (barren). A synonym of *Phyllostachys aurea.*

B. tessellata (tessellated). The correct name of *B. Ragamowski. fl.*, inflorescence a narrow panicle, on stems 1½ft. to 2ft. or more in length; spikes composed of five or six closely-set, one-flowered spikelets, on the moderately short branches (2in. to 2½in.) of the panicle. *l.* oblong, acuminate, 4in. to 8in. long, 1½in. to 2½in. broad, bright green above, bluish-green beneath, changing in autumn to yellow, or with a broad yellow border. Japan, 1888. A very ornamental, dwarf, hardy Bamboo, also known as *B. palmata, B. Ragamowskii* (see Vol. I.), and *B. Veitchii.*

B. Veitchii (Veitch's). A synonym of *Arundinaria Veitchii.*

B. Vilmorini (Vilmorin's). A synonym of *B. angustifolia.*

B. Wieseneri (Wiesener's). Stems brownish-black or dark olive-green. Japan, 1887. Garden variety. A fine, hardy Bamboo, resembling in habit and vigour *Arundinaria japonica* (this being the correct name of the plant described on p. 118, Vol. I., as *A. Metake*).

BAND-PLANT. *See* **Vinca major.**

BANISTERIA. No less than sixty species, natives of tropical America (especially Brazil), are comprised in this genus. Several plants formerly referred here are placed by modern botanists under **Heteropterys** and **Stigmaphyllon** (which *see*).

BANKSEA. A synonym of **Costus** (which *see*).

BANKSIA. About forty-six species of this genus have been described; all are Australian, and most of them extra-tropical. Flowers sessile, in pairs, disposed in dense spikes, terminal or axillary, crowded within the floral leaves; fruit-bearing spikes changing into thick, woody strobiles. To the species described on pp. 156-7, Vol. I., the following should be added:

B. ericifolia (Erica-leaved). *fl.* yellow; spikes cylindrical, 6in. to 10in. long. *l.* crowded, narrow-linear, truncate or notched at the end, otherwise entire, rarely exceeding ½in. in length, with closely revolute margins. *h.* 12ft. to 14ft. 1788. (A. B. R. 156; B. M. 738.)

B. grandis (large).* *fl.* yellow; spikes cylindrical, 8in. to 12in. long. *l.* often 1ft. or more in length, divided to the midrib into ovate-triangular, contiguous segments, the larger ones 1½in. to 2in. long, and 1in. broad at base, the lower ones gradually smaller, all flat, with several veins impressed above, prominent beneath, the under-surface pale. *h.* 40ft. 1794. One of the best of cultivated species.

B. integrifolia paludosa (marsh-loving). A variety having smaller flowers and shorter leaves than in the type. (B. R. 697, and L. B. C. 392, under name of *B. paludosa.*)

B. marcescens (weak). *fl.* purple; spikes dense, oblong or cylindrical, 3in. to 10in. long, like those of *B. media. l.* petiolate, oblong, truncate, serrated, almost obtuse at base, 1in. to 1½in. long, about ¼in. broad, flat, minutely tomentose beneath. Branches tomentose. *h.* 5ft. to 6ft. 1794. (B. M. 2803.) SYN. *B. præmorsa* (A. B. R. 258).

B. media (medium). *fl.* yellow; spikes oblong or cylindrical, 3in. to 6in. long. *l.* lanceolate-cuneate, truncate, serrated, 2in. to 3in. or more in length, ½in. to ¾in. broad, flat, tomentose beneath, tapering into short petioles. Branches hoary-tomentose. *h.* 6ft. 1824. (B. M. 3120.)

B. paludosa (marsh-loving). A form of *B. integrifolia.*

B. præmorsa (bitten). A synonym of *B. marcescens.*

B. prostrata (prostrate). *fl.* yellow; spikes rarely above 3in. long, oblong or cylindrical, turned up at the ends of the stems. *l.* erect, often above 1ft. long and 1in. to 1½in. broad, divided about half-way to the midrib into broadly ovate or triangular, mostly obtuse lobes, thick, flat, and rigid. Stems prostrate, tomentose. 1824. (B. R. 1572.)

B. serrata (saw-edged). *fl.* red; spikes oblong-cylindrical or rarely globular. *l.* oblong-lanceolate, acute or truncate, deeply serrated, 3in. to 6in. long, ½in. to 1in. broad, coriaceous, flat, hoary or white beneath, tapering to the petioles. *h.* 20ft. (A. B. R. 82.) A very pretty species.

B. speciosa (showy), of Lindley. A synonym of *B. Victoriæ.*

B. spinulosa (slightly spiny). *fl.* yellow, larger than in *B. ericifolia*; spikes ovoid, 2in. to 3in. long, rarely cylindrical and longer. August. *l.* narrow-linear, 1½in. to 3in. long, notched at the end, with a point in the notch, often bordered towards the end with two or three small teeth on either side. *h.* 6ft. 1788. (A. B. R. 457.)

B. undulata (waved). A synonym of *B. æmula.*

B. verticillata (whorled). *fl.* yellow; spikes oblong-cylindrical, 4in. to 8in. long. August. *l.* usually in whorls of four to six, shortly petiolate, oblong-lanceolate or broadly linear, with recurved margins, white beneath, those of the flowering stems 1½in. to 3in. long. *h.* 12ft. 1794. (H. E. F. 96.)

B. Victoriæ (Victoria's). *fl.* yellow; spikes thick, oblong, 3in. to 5in. long. *l.* 8in. to 12in. long, divided more than half-way to the midrib into broad, triangular, acute or acuminate lobes, the larger ones ½in. long and broad. *h.* 12ft. to 15ft. (B. M. 4906.) SYN. *B. speciosa*, of Lindley (B. R. 1728).

BANKSIA (of Domb.). A synonym of **Cuphea** (which *see*).

BANKSIAN ROSES. Somewhat tender Roses from China, for whose introduction we are indebted to Lady Banks.

BAPHORHIZA. A synonym of **Alkanna** (which *see*).

BARBACENIA. To this genus eighteen species have been referred, natives of Brazil, Guiana, and Venezuela.

B. squamata (scaly). A synonym of *Vellozia squamata.*

BARBADOS CEDAR. *See* **Juniperus bermudiana.**

BARBAREA. Yellow Cress. About a score species have been referred to this genus by various authors, but according to Bentham and Hooker not more than six are sufficiently distinct to rank as such; they are broadly distributed over temperate regions, the genus being represented in the British Flora by *B. vulgaris* (St. Barbara's Heath) and several varieties, of which the plant described as *B. præcox* is one. *See* **Cress (American).**

BARBE DE CAPUCIN. *See* **Chicory.**

BARBERRY RUST. This well-known deep yellow Rust, found upon the common Barberry (*B. vulgaris*), the much-grown *Mahonia* (*Berberis*) *Aquifolia*, and allies in spring, is but the Cluster-cup stage of the exceedingly destructive blackish Rust of Wheat and other cereals, and known as **Puccinia graminis,** described and illustrated in Vol. III.

BARBULA. A synonym of **Caryopteris** (which *see*).

BARIDIUS TRINOTATUS. *See* **Potato Insect Pests.**

BARK. This is largely employed as a plunging material for Pine-plants in pots. The tan is placed over a hot-air chamber and made into a bed, in which the pots are plunged up to their rims, the heat in the bed being regulated by the hot-water pipes in the chamber underneath. All plants in pots requiring bottom-heat may be grown in the same manner.

BARK-BEETLES. *See* **Scolytidæ.**

BARKERIA. This genus is now included, by the authors of the "Genera Plantarum," under *Epidendrum*. To the species described on p. 158, Vol. I., the following should be added:

B. Barkeriola (Barkeriola). A synonym of *Epidendrum Barkeriola*.

B. cyclotella (circular). *fl.* very showy, disposed in a terminal raceme; sepals and petals deep magenta; lip white, margined magenta, broad, emarginate. February and March. *l.* distichous, ligulate-oblong, acute. Stems as thick as a quill. Mexico. (W. O. A. iv. 143.)

B. elegans nobilior (nobler). A fine, large-flowered variety, having a blackish-purple spot on the lip. 1886.

FIG. 140. FLOWER OF BARKERIA LINDLEYANA.

B. Lindleyana. This species is one of the most beautiful in the whole genus. See Fig. 140.

B. spectabilis. A showy species, which is at its best about midsummer. See Fig. 141.

Barkeria—*continued.*

FIG. 141. FLOWER OF BARKERIA SPECTABILIS.

B. Vanneriana (Vanner's). *fl.* fine rosy-purple, with a small, whitish disk on the lip, equal in shape to those of *B. Lindleyana*; lip rounded, acute, much like that of *B. Skinneri*. 1885. A fine plant, intermediate in character between the two species named.

BARKHOUSIA RUBRA. A synonym of **Crepis rubra** (which *see*).

BARK LICE. A popular name for Scale Insects.

BARK-WOUNDS. These are of far greater consequence than is usually attached to them by the gardener, especially in the case of dicotyledonous trees. Wounds may result from a number of causes, chief amongst which are careless pruning, hard knocks at felling time, cuts from scythes and mowing-machines, and barking by cattle, deer, and small mammals like mice. Trees so injured are liable to various forms of "rot," some of the most destructive being those for which fungi like *Armillaria mellea* (*Agaricus melleus*) are responsible. Destructive insects like *Sirex gigas* (Horn-tailed Sawfly) and certain Ants also find a ready access by means of wounds.

BARLERIA. This genus embraces about sixty species of herbs and shrubs, mostly natives of Asia and tropical and South Africa, the few American ones being principally Mexican or Columbian. Corolla tube long, the limb of five rounded or ovate lobes. Leaves opposite, entire, the axils often armed with spines. To those described on p. 158, Vol. I., the following should be added. *See also* **Barleriola.**

B. cristata (crested). *fl.* purplish-blue or white; corolla 1½in. long, the lobes ovate, ½in. long; spikes ovate, often compound, dense. July. *l.* oblong or elliptic, acute, 1in. to 4in. long (according to locality, &c.). Branches and leaves yellow-hairy. Sub-tropical. India, 1796. Plant erect or diffuse. (B. M. 1615.)

B. gentianoides (Gentian-like). A synonym of *B. flava*.

B. involucrata (involucred). *fl.* blue; sepals 1in. long, elongated-elliptic; corolla 2in. long, the lobes obovate-elliptic; racemes few-flowered, axillary; bracteoles lanceolate or linear. *l.* elliptic, 4½in. long, 1¾in. broad, narrow at both ends. India. Plant yellow-strigose.

B. i. elata (tall). *fl.* dark blue, 2½in. across. *h.* 6ft. Singapore, 1890. A compact, showy variety.

B. repens (creeping). *fl.* axillary, solitary, sessile or shortly pedicellate; corolla pale, rather dull rosy-red, 2in. long, the tube funnel-shaped, the limb 1½in. in diameter, of five oblong lobes. July. *l.* opposite, appearing as if fascicled, 1in. to 2½in. long, elliptic-ovate or obovate; petioles ⅛in. to ½in. long. Stems 1ft. to 2ft. long, prostrate. Eastern tropical Africa, 1875. (B. M. 6954.)

B. solanifolia (Solanum-leaved) A synonym of *Barleriola solanifolia*.

BARLERIOLA (a diminutive of *Barleria*, to which genus this is related). ORD. *Acanthaceæ*. A small genus (two species) of small, much-branched, stove shrubs, with axillary spines, natives of Cuba and San Dominga. Flowers small, fascicled in the axils, sub-sessile; bracteoles small, subulate. Leaves small. *B. solanifolia* (SYN. *Barleria solanifolia*) has been introduced, but is probably no longer grown.

BARLIA. Included under **Orchis** (which *see*).

BARNADESIA. SYN. *Xenophonta*. Including *Bacazia*. About ten species, all natives of South America, are included in this genus. Flower-heads purple or pink, homogamous, corymbose at the tips of the branches, subradiate, rarely with only one floret; involucral bracts in many series, the outer ones gradually shortening; receptacle flat. Leaves alternate, often fascicled at the axils, entire, three-nerved or penniveined.

BAROSMA. Fifteen species are included in this genus.

B. crenulata (slightly crenate). The correct name of *B. latifolia*. (B. M. 3413.) SYNS. *B. crenata*, *Bucco crenata*, *Diosma latifolia* (L. B. C. 290).

B. scoparia (Broom-like). The correct name of *B. dioica*.

BARRALDEIA. A synonym of **Carallia** (which *see*).

BARRED YELLOW MOTH. *See* **Cidaria.**

BARRINGTONIA. This genus embraces about a score species, natives of tropical Africa, Asia, and Australia. Petals four, rarely five; stamens numerous, in many series. To the species described on p. 159, Vol. I., the following should be added. *See also* **Stravadium** (which is included under this genus by Bentham and Hooker).

B. samoensis (Samoan). *fl.* in long, simple, axillary, pendulous racemes, 2ft. long, with a reddish-brown rachis; petals scarlet, ball-like before expansion, when expanded nearly 1in. long, reflexed; stamens yellow, very numerous, forming a sort of brush 3in. in diameter. May. *l.* sessile, 1ft. to 2ft. long, spreading and decurved, oblanceolate, narrowed to a very short petiole. Polynesia, 1851. A tall, handsome tree. (B. M. 7337.) SYNS. *Butonica samoensis* (T. L. S. ser. ii. Bot. i., p. 75, f. 20-25), *Stravadium insigne* (F. d. S. vii., tt. 654-5).

BARRINGTONIACEÆ. Included under **Myrtaceæ** (which *see*).

BARROTIA. Included under **Pandanus** (which *see*).

BARTHOLINA (named in honour of Thomas Bartholin, a celebrated Danish anatomist and physiologist, born in 1616). ORD. *Orchideæ*. A monotypic genus. The species is a remarkable, small, tuberous, terrestrial Orchid, requiring cool-house treatment and a sandy-loam soil. Propagated by divisions.

B. pectinata (comb-like). Spider Orchid. *fl.* very pale lilac, 2in. to 3in. broad across the numerous spreading, comb-like threads into which each segment of the three-parted lip is divided; sepals erect; petals straight or falcate; scape 3in. to 4in. high, reddish-brown. July. *l.* solitary, orbicular, ½in. to 1in. in diameter, convex, deeply two-lobed, lying flat on the ground. Tuber ovoid, ½in. long. Cape of Good Hope, 1787. (B. M. 7450.)

BARTOLINA. A synonym of **Tridax** (which *see*).

BARTSIA (named by Linnæus in honour of his friend John Bartsch, M.D.). SYN. *Lasiopera*. Including *Eufragia*. ORD. *Scrophularineæ*. A genus comprising about sixty species of mostly hardy, annual or perennial, usually erect herbs, natives of Europe, extra-tropical Asia, North and South Africa, and the mountains of South America. Flowers sessile or shortly pedicellate, the upper ones often forming a spike; calyx five-cleft; corolla tube straight or incurved, the limb bilabiate, the anterior lip with three spreading lobes; stamens four, didynamous. Leaves opposite, the upper floral ones decreasing. Three of the species—*B. alpina*, *B. Odontites*, and *B. viscosa*—are natives of Britain, but none are of any particular value as garden plants.

B. coccinea (scarlet). A synonym of *Castilleja coccinea*.

B. pallida (pale). A synonym of *Castilleja pallida*.

BARWOOD. *See* **Baphia.**

BARYOSMA. A synonym of **Dipteryx** (which *see*).

BASE. That part of a leaf or other organ which is attached to its support.

BASELA. *See* **Basella.**

BASELLA. ORD. *Chenopodiaceæ*. This genus is monotypic, according to Bentham and Hooker, and the correct name of the species, as given in the "Flora of British India," is *B. rubra*.

B. tuberosa (tuberous). A synonym of *Ullucus tuberosus*.

BASILÆA. A synonym of **Eucomis** (which *see*).

BASILEOPHYTA. A synonym of **Fieldia** (which *see*).

BASSIA. SYN. *Dasyaulus*. This genus embraces about eighty species, natives of the East Indies and the Malayan Archipelago.

BASSOVIA. The correct name of **Witheringia** (which *see*).

BAST. *See* **Scirpus lacustris.**

BASTARD CLOVER. *See* **Trifolium hybridum.**

BASTARD CRESS. *See* **Thlaspi.**

BASTARD FEVERFEW. *See* **Parthenium Hysterophorus.**

BASTARD HARE'S-EARS. *See* **Phyllis Nobla.**

BASTARD IRONWOOD. *See* **Trichilia hirta.**

BASTERIA. A synonym of **Berkheya** (which *see*).

BATEMANNIA. According to Bentham and Hooker, this is now a monotypic genus, the only true species being *B. Colleyi*. Several of the species have been transferred to **Zygopetalum** (which *see*).

BATIDEÆ. A monotypic natural order, allied to *Polygonaceæ*, the species being a tropical seaside shrub of botanical interest only.

BATONEUS POPULI. *See* **Populus.**

BATS (*Cheiroptera*) are of especial interest to the farmer and gardener, because they are entirely insect-eaters, so far as the representatives in England are concerned, and therefore of immense benefit. To the naturalist they are likewise of interest, because of the fact that they are the only mammals capable of flight. There is no need here to refer in detail to the peculiar modification of the bones of the fore-limb, or the leathery membrane enabling them to fly. Here we are chiefly concerned with their habits, which are nocturnal or crepuscular, and as before stated, insect-eating. They are exceedingly useful in keeping down some of the worst pests against which gardeners and farmers have to contend—the Cockchafers and June Bugs. Of the first-named a single Bat has been known to take as many as thirteen in succession. Bats also devour enormous quantities of Dipterous insects (Flies) and the smaller and very injurious Moths (*Micro-Lepidoptera*). There are some sixteen species found in this country, although some are rare or local. All, however, should be strictly preserved.

BATSCHIA LONGIFLORA. A synonym of **Lithospermum angustifolium** (which *see*).

BAT'S-WING FERN. *See* **Pteris incisa.**

BAUERA. There are two or three species. *B. humilis* is a variety of *B. rubioides*.

B. rubioides microphylla (small-leaved). *fl.* small, on long and slender pedicels. *l.*, leaflets mostly about ¼in. long. Plant small, slender, and prostrate.

BAUHINIA. As many as 130 species of this genus have been described; they are broadly dispersed over tropical regions. To those described on pp. 161-2, Vol. I., the following should be added:

B. Galpini (Galpin's). *fl.* crimson or scarlet, six to ten in a leaf-opposed raceme; petals 1in. to 1½in. long, with a claw as

Bauhinia—*continued.*

long as the orbicular limb. October. *l.* petiolate, 1in. to 3in. long, orbicular or transversely broadly oblong, broadly two-lobed, pale green. *h.* 5ft. to 10ft. Transvaal, 1895. A half-climbing shrub. (B. M. 7494.)

B. grandiflora (large-flowered). *fl.* pure white, very large, expanding in the night, solitary at the tips of the axillary peduncles. *l.* ovate or cordate at base. Branches spiny. *h.* 15ft. to 20ft. Andes, 1897. Tree. (R. H. 1897, p. 393, f. 126.)

B. variegata. This is figured in B. M. 6818.

B. v. candida (white). *fl.* pure white, large, fragrant. *l.* bright green. *h.* 5ft. Tropical Asia, 1893. A handsome shrub. (B. M. 7312; J. H. 1893, xxvi., p. 277, f. 54.)

BAUMANNIA. A synonym of **Damnacanthus** (which *see*).

BAY-LEAVED WILLOW. *See* **Salix pentandra.**

BEAD-TREE. *See* **Ormosia.**

BEAM-TREE, SWEDISH. *See* **Pyrus intermedia.**

BEAN. BROAD AND LONG-PODDED SORTS. For early sowing the best are: Aquadulce, Bunyard's Exhibition, Dobbie's Champion, and Giant Seville Long-pod. The pods of these are all very long and freely produced, but the Beans are not so good in flavour as the Windsor section, which are a little later than the Long-pods. The following are the best of the Windsor class: Green Windsor, Harlington Windsor, and Improved Broad Windsor.

BEANS, DWARF OR FRENCH. *Sorts.* The following are best for forcing: Emperor William (this is the earliest forcing variety), Ne Plus Ultra, Osborn's Dwarf Prolific, and Williams' Early Prolific. For outside sowing: Best of All, Canadian Wonder, Mammoth Long-podded Negro, and Princess. There are a number of Golden-Butter, or Wax-podded varieties, that so far have not found favour in Britain. The majority of the sorts are dwarf, and, as the name indicates, the pods are of a waxy golden colour, and are cooked whole, the flavour being good if the pods are picked young. The best of this class is Barr's Golden Wax-pod. There is also a Climbing French Bean under the names of Veitch's Climbing French Bean and Sutton's Tender and True. It is earlier than the Scarlet Runners, a great bearer, and of good flavour.

RUNNERS, OR CLIMBING KIDNEY BEANS. *Sorts:* Champion Scarlet, Giant White Czar, Girtford Giant, Hill's Prize Scarlet, Ne Plus Ultra Scarlet, and Sutton's Prize Winner.

BEAN ANTHRACNOSE (*Colletotrichum lindemuthianum*). A well-marked fungus, characterised, as its common name denotes, by a black spotting. In America the disease is very prevalent, and as it may be readily introduced by infected seed the gardener must exercise great care at sowing time. To treat the seed to a fungicide does not seem to be of much avail, judging by the report of Professor Beach, of Iowa, who has made a special study of Bean diseases. Pods, foliage, and stems are all affected, and very young seedlings as well as fully-matured plants. At first the spots are small, but as the disease progresses they increase in size, coalesce, and pit: usually they are edged with red.

Preventive measures consist, according to Professor Beach, in the selection of sound seed (that with dark pits should be rejected), the prompt removal of infected seedlings (the stems should be watched for discoloured patches), and thoroughly spraying with weak Bordeaux Mixture at intervals.

BEAN RUST. *See* **Pea Fungi.**

BEAN, UNDERGROUND. *See* **Voandzeia subterranea.**

BEARD. A tuft of hairs; the awns of Grasses.

BEARDGRASS. *See* **Polypogon.**

BEATSONIA PORTULACIFOLIA. A synonym of **Frankenia portulacifolia** (which *see*).

BEAUCARNEA is the correct name of **Nolina** (which *see*).

BEAUHARNOISIA. A synonym of **Tovomita** (which *see*).

BEAUMONTIA. This genus embraces four species of tall, stove trees or shrubs, natives of the East Indies and the Malayan Archipelago. Flowers white, large, scented, disposed in terminal cymes; calyx five-parted; corolla funnel-shaped, with a short tube and five twisted lobes. Leaves opposite, membranous, often bearing small glands at the axils. To the species described on p. 164, Vol. I., the following variety should be added:

B. grandiflora superba (superb). This is a lovely variety, with white, trumpet-shaped flowers. 1894.

BECIUM. Included under **Ocimum** (which *see*).

BEDDING PLANTS. At one time this term was practically restricted to the ordinary summer occupants of Beds and borders, and a few sub-tropical Bedders. To-day it has a far wider meaning, and Bedding Plants may very well be divided into three groups, according to the season of the year in which they are employed—Spring, Summer, or Autumn. First as to

SUMMER BEDDERS. For these it is now generally recognised that a long-continued display of flowers is very exhausting to the soil, and consequently a good foundation must be laid. The Beds should be well-drained, well-manured, and deeply-worked. The benefits to be derived from deep cultivation are many: it gives a greater degree of openness to the soil, so that the roots can penetrate the more easily, and in dry seasons descend to where the soil is moist, thus escaping, to a greater degree, the evils of drought. In wet seasons, the surplus water also escapes more readily to the drains and subsoil, instead of standing about the roots of the plants and causing their decay. An excellent plan to adopt is to trench the Beds to a depth of 2ft. every second season, and time thus spent will be well repaid by the superior health and beauty of the plants grown.

As to soil, the best for the cultivation of the majority of Bedding Plants is undoubtedly a deep, light loam, resting on a dry subsoil. If the soil is very light and sandy, it is greatly improved by having a quantity of heavy loam incorporated with it; but if it is naturally unsuitable, the best way to remedy the evil is to excavate the original soil to a depth of 2ft., replacing it with, say, a compost of two parts friable loam and one part leaf-mould.

If plants are to be grown in the same ground for several consecutive years, manure must be applied to the soil, or it will soon become exhausted. For this purpose, nothing is better than old hotbed- or well-decomposed cow-manure, on no account using the latter in a fresh state. The dressings are best applied when the Beds are trenched, mixing the manure well with the soil. If trenching is not necessary, the manure might be scattered over the surface and forked well in. In districts where the rainfall is great, as in the neighbourhood of hills, many plants, such as Pelargoniums, produce leaf at the expense of flower. In such localities, the soil should be raised more above the ground-level, and, of course, manure should be more sparingly applied.

The time for planting out depends on the general climate of the district, the position of the garden as to shelter, and the condition of the plants, together with the character of the individual season. It is certainly much better to wait a week or two than to remove plants out of sheltered situations into the open Beds, if there is any fear of cold winds or a night's frost, in which case they would no doubt receive a check sufficient to affect their well-being for the whole season. The usual time for planting out is the end of May or during the month of June. Showery weather is generally chosen for the operation, but should dry weather prevail, planting may commence in June, providing the Beds receive a good watering immediately after.

Bedding Plants—*continued.*

This is preferable to planting when the soil is very wet and sticky, as then it is apt to be pressed into hard lumps. When the plants are in pots, it is best to water them thoroughly overnight, so as to have the balls in a perfectly moist condition by the morning, as when turned out of a pot, and when rather dry, it is almost impossible to get water to enter the ball after the plant has been put in the ground, and it naturally suffers in consequence. If the weather continues dry after planting, liberal waterings should be given at intervals, never allowing the plants to suffer for want of water. The removal of decayed leaves and flowers should be regularly seen to throughout the summer, so that the Beds may at all times present a neat and tidy appearance.

The blending and contrasting of colours is a subject that requires great attention in Bedding arrangements. The harmonising of one colour with another generally produces the most pleasing effect. Thus, by arranging the colours purple, red, pink, salmon, yellow, and white, in the order named, the eye is led gradually from one colour to the other, and perfect harmony prevails. In planting small Beds, however, it is not advisable to introduce too many shades of colour—two, or, at the most, three, will suffice. The most accommodating colour for contrasting with others is white or very light grey, such as is supplied by *Cineraria maritima* or *Cerastium tomentosum*; these plants associate well with all strong colours, and produce striking contrasts.

The gardener of the present day has considerable advantage over his predecessors in the matter of bedding, as the number of beautiful subjects at his disposal is infinite. He has, too, the choice of three distinct styles of Summer Bedding: Ordinary Summer Bedding, Sub-tropical, and Carpet Bedding.

Ordinary Summer Bedding.—Ageratums are useful Bedding plants, blossoming continuously from June till October, or until destroyed by frost; they vary in height from 4in. to 15in. The flowers, which are some shade of blue, or white, are lasting, and retain their colour well. They are excellent plants either for edgings, for small Beds by themselves, or for mixing with Tricolor Pelargoniums, &c.; also as carpeting plants for Fuchsias or other tall-growing subjects. Seeds may be sown in January or February in heat, and the seedlings grown on in small pots, and gradually hardened off ready for planting out in June. They are also propagated readily from cuttings at any season, a little bottom-heat being beneficial.

The dwarf varieties of *A. mexicanum* are the kinds generally used,-such as Cupid, Swanley Blue (often used as an edging plant for Beds of Variegated Pelargoniums), The Zoo, Albiflorum Nanum, Cannell's Dwarf, Imperial Dwarf, Lady Jane, Countess of Stair, Johannas Pfitzer, Le Geant, Perle Bleu, Enfant de Paris, Tapis Blanc, Snowflake, and La Candeur. Several varieties of *Beta vulgaris* are used for Bedding on account of their highly-coloured crimson, dark purple, or bronzy foliage. Dell's Crimson is a well-tried variety; Dracæna-leaved Beet is also good for edgings, growing only 1ft. high, and producing elegant recurved crimson foliage.

The tuberous-rooted Begonias constitute a class of plants admirably adapted for this style of Bedding. They may be grown with less labour and attention than many Bedding Plants, and when in flower it is surprising how they will withstand the ill-effects of wind and heavy rain, and remain one mass of colour until frost puts in an appearance. The shrubby fibrous-rooted section also contributes several species which are now used for Bedding purposes; of these, *B. semperflorens* and its varieties are especially suitable, as they flower with the greatest profusion throughout the whole summer, and also stand the wet weather exceedingly well. The varieties of Begonias suitable for Bedding purposes are now numerous, the following being amongst the best: Worthiana, Erfordi, Vesuvius, Cannell's Scarlet, Baumanni, Queen of Bedders,

Bedding Plants—*continued.*

Ascotensis, Castanæfolia, and Knowsleyana. Most of our nurserymen offer seeds of both single and double varieties, saved from flowers of all shades of colour from white, orange, yellow, and pink, to dark crimson. Seedlings are frequently employed for Bedding, and may be cheaply procured.

Calceolarias are subjects that require good, deep, rich soil, with plenty of manure, the object being to grow them vigorously so as to get healthy green plants, free from insects. The shrubby kinds are generally grown for bedding purposes. These include such well-known forms as Gaine's Yellow, Sultan, and Golden Gem; these grow from 12in. to 18in. in height. *C. amplexicaulis* belongs to the herbaceous section; the plant grows 1½ft. high, and is very good for associating with other taller-growing subjects.

Celosias are now used for Bedding purposes, and very graceful decorative plants they prove to be, with their showy, feathery plumes of flowers. *C. pyramidalis* grows to a height of 18in., and has numerous varieties, usually some shade of yellow or crimson. They are generally described under the name of *C. plumosa*. Sutton's Dwarf is one of the best. Of *C. cristata* (Cockscomb) there are several varieties, most of them with crimson combs. Giant Empress and Vesuvius are both handsome. *Centaurea ragusina* is a valuable Bedding Plant, with broad, silvery-white foliage, for which alone it is used; it is excellent for contrasting with any strong colour, and forms a suitable subject for edgings to Beds of Coleus, Iresines, Perillas, &c. *Cineraria maritima* is a hardy perennial with silvery-white foliage and heads of yellow flowers. The flower-stems must, however, be pinched out as soon as they appear, as it is the silvery foliage that is required. It is largely used for edgings to Beds of Perillas, &c., taking the place of *Centaurea ragusina*. *Coleus Verschaffeltii* is one of the best crimson-leaved plants used for Bedding; it grows from 12in. to 18in. high. It makes very effective Beds when edged with silver- or golden-leaved plants, such as *Cineraria maritima* or Pyrethrum Golden Feather. Taylor's Pet withstands the cold better than *C. Verschaffeltii*.

Fuchsias are largely used in Summer-Bedding arrangements, and very effective plants they prove to be, with their graceful drooping flowers. Some are allowed to assume a bush form, whilst others are kept to a single stem, and grown into pyramids. The dwarf, bushy kinds form excellent Beds, either alone or edged with other dwarf-growing Bedding Plants. Those grown into pyramids make beautiful objects, their drooping branches showing off to advantage. They require a carpeting of Ageratums, Violas, or other dwarf-growing subjects. The varieties of Bedding Fuchsias are very numerous; in fact, almost all of the Fuchsias are sufficiently hardy to stand outside during the summer. Dunrobin Castle is very distinct, and it is suitable for either small Beds, carpeting below taller plants, vases, window-boxes, or for growing into standards. There are several varieties, with richly-coloured or variegated leaves, which are grown extensively for bedding purposes. Amongst these are Cloth of Gold, Sunray, and Meteor.

Gaillardias, as well as being ornamental border-plants, are excellent for Bedding displays. They should be planted rather thinly, so as to allow room for pegging-down the shoots. *G. grandiflora maxima* is one of the best of the perennials. The half-hardy annual varieties, such as *Lorenziana*, *Drummondii* or *picta*, *amblyodon*, &c., are also very effective and useful Bedding Plants, on account of their richly-coloured flowers and the long duration of their flowering period. Gazanias are useful for sunny positions. *G. splendens* is a handsome and much-grown trailer. Heliotropes are always popular for their deliciously fragrant flowers. The dwarf kinds are suitable either for forming Beds by themselves or for

Bedding Plants—*continued.*

carpeting Beds of taller-growing subjects, whilst the vigorous growers are admirable for training into pyramids, carpeting the Beds with other dwarf subjects. Miss Nightingale, although an old variety, is still one of the best for Bedding, while President Garfield and White Lady are also to be recommended.

Two or three Iresines are indispensable for Summer Bedding, on account of their richly-coloured foliage. Like Heliotropes, Iresines are rather tender, and ought not to be planted out until the season is well advanced. To bring their foliage to perfection a warm season, with an abundance of sunshine, is necessary. *I. Herbstii*, *I. aureo-reticulata*, and *I. Lindeni* are excellent; the last forms a fine edging plant to Beds of Pelargoniums, &c.

The named varieties of Lantana, with their large Verbena-like heads of richly-coloured flowers, produced abundantly during the whole summer, are charming subjects for Beds. They are as easy to cultivate as Pelargoniums, and may be used either in Beds by themselves, or as carpeting plants for tall-growing Fuchsias, &c.; or they may be trained as standards. Drap d'Or is unequalled for Bedding, while Don Calmet is very floriferous. The predominating colour amongst the dwarf-growing Lobelias is blue, a colour which is rather rare amongst the ordinary run of Bedding Plants. To this, and to their dwarf compact habit, may be attributed the reason of their universal adoption for Bedding purposes, and especially as edgings to Beds of taller subjects.

Lobelia Erinus is the species from which most of our dwarf Bedding varieties have sprung. *L. speciosa*, *L. compacta*, *L. pumila magnifica*, *L. ramosa*, Cobalt Blue, Swanley Blue, Crystal Palace, and Emperor William are amongst the best dwarf kinds. Of the taller-growing kinds *L. cardinalis*, *L. fulgens* or *L. splendens*, Queen Victoria, and Firefly, in mild districts, prove hardy enough to stand the winter outside with a light covering of ashes, &c., though it is always best to lift and store them in a dry shed, starting them into growth again in spring.

In the whole range of Bedding Plants it would be difficult to name a more popular favourite than the Zonal Pelargonium. There are ordinary Zonals, Golden-bronzed Zonals (Model, Golden Harry Hieover, and Bronze Queen), Yellow-leaved (Crystal Palace Gem and Robert Fish, with zoneless leaves), Golden Tricolors, Silver Tricolors, White-Edged (these fine-foliaged varieties are generally grown for the sake of their leaves, and on this account are seldom allowed to flower), and Ivy-leaved. These last are suitable for covering trellises and for growing in vases, where their long, trailing growths, hanging over the sides, show off to advantage. They are rather more tender than the Zonal kinds, and require to be kept a little warmer during the winter.

Perilla nankinensis is a most useful Bedder, and is generally employed for edgings or for mixing with silver-leaved plants, on account of its dark purplish foliage. Petunias are very showy and popular subjects when grown in masses in a sunny position and fairly rich soil. They are very effective when trained over hoops, fences, and trellises, as well as disposed over tree-stumps. *Phlox Drummondi* is a plant which cannot be passed by unnoticed, as for filling small Beds, or for mixing with taller-growing subjects, it is superb. Pyrethrum Golden Feather is a well-known, free-growing Bedding Plant, suitable for edgings, &c. It has been styled "the gardener's friend," and it certainly is a treasure to him, for it can always be relied upon, and is always in season. In spring the plants look like masses of gold, and in summer they light up the whole garden, and harmonise with everything.

Verbenas rank amongst the showiest of our Summer Bedding subjects; they are very effective in Beds, especially when mixed with some contrasting colour,

Bedding Plants—*continued.*

such as is supplied by the Silver-Leaved Pelargoniums. There are also several named varieties which are very useful for Bedding purposes, such as Crimson King, Purple King, and *V. Melindres splendens.*

Sub-Tropical Bedding.—The introduction of large-foliaged, stately, sub-tropical plants into our flower-gardens during the summer months has been arranged so as to enable us, as it were, to obtain faint glimpses of the grandeur of tropical vegetation. In this style of Bedding any sub-tropical plant may be used, providing it is sufficiently robust in constitution to withstand the variations of our changeable climate. Many of the plants used are of a tender nature, and only suitable for standing outside during the hottest part of the summer; but there are others which are hardy enough to withstand an ordinary English winter—in the South of England, at any rate. To this latter group belong such plants as *Gynerium argenteum* (Pampas Grass), *Arundo Donax*, *Gunnera scabra* and *G. manicata*, *Chamærops humilis*, *C. Fortunei (Trachycarpus excelsus)*, and the Bamboos. These stately subjects are suitable for planting either as single specimens about the lawn or in groups in sheltered positions. The Gunneras require damp situations, preferably near the banks of lakes or streams, and when the foliage dies down in the late autumn, the crowns should be protected from frost by having a quantity of dry leaves thrown over them to the depth of 12in. or 18in. As the Gunneras start into growth early in the season, the winter covering should be removed before the young leaves have made much progress, otherwise they will be damaged during the operation. When in the young state the leaves are very tender, and preparation must be made for covering up the plants if any signs of frost appear.

Returning to the non-permanent Sub-tropical Bedders, there are two distinct groups—to the one belong the Agaves, the tender Yuccas, Dracænas, Musas, Tree-Ferns, and several of the Palms—plants generally of slow growth, which are kept in pots or tubs, and plunged outside during the summer, and have to be removed to the greenhouse for the winter; these present a fine appearance, giving to the garden a tropical aspect. One of the most essential points in the culture of Musas, Tree-Ferns, and, in fact, of all tender large-foliaged plants grown outside, is that of shelter, as if exposed to high winds the leaves get torn to shreds, and the plants are thereby disfigured, and look unsightly objects in the flower-garden. It is therefore imperative that a sheltered position should be chosen for this phase of Sub-tropical Bedding. For more exposed situations, and for terrace gardens, the Agaves and Yuccas are amongst the best of stately-foliaged plants, as the leaves are not liable to be damaged by the wind, and the plants themselves are more in accordance with their surroundings. As this class of plants require a considerable amount of room for their accommodation in winter, it is evident that Sub-tropical Bedding cannot be carried out to any extent, except in very large establishments, where plenty of room is at command during winter.

To the other group belong the Cannas, the tubers of which may be taken up in the late autumn, and after being dried, stored away for the winter in a shed or other suitable structure, where they are out of the reach of frost. With this group may be included numerous robust-growing annuals that are readily raised from seed sown in February, and which make quite large plants, if grown well. Of these the Castor-oil, Solanums, and Tobacco plants are examples. With regard to planting out, the second week in June is about as early as it is safe to plant out Castor-oil plants and other soft-wooded subjects grown from seed. It is preferable to have stout young plants, well-rooted, and carefully hardened off, as they succeed much better than larger specimens grown on in a high temperature and insufficiently hardened off; in fact,

Bedding Plants—*continued.*

this point constitutes one of the elements of success in the management of these large-foliaged plants.

Besides the plants mentioned elsewhere, numerous others may be used for Sub-tropical Bedding, such as Carlina, Aloe, Sumach, Fatsia (Aralia), Funkia, Eryngium, Rheum, Heracleum, Bocconia, Cassia, &c. Also available are some of the ordinary Summer Bedding plants, such as Coleus, Iresines, Perillas, Beet, Centaureas, Cinerarias, &c., which are used either for mixing with the sub-tropical plants in the Beds, or as edgings for the same. Carpeting plants, such as the Alternantheras, are also used, and when judiciously arranged, give a finished appearance to the Beds. In fact, the modes of arranging the plants at command are endless; yet the same object is kept in view, viz., an attractive and effective display, avoiding all formality, but at the same time aiming at a neat, symmetrical appearance when completed.

Abutilons, if planted outside in June, will flower freely throughout the summer. Several ornamental-foliaged varieties are grown for Bedding purposes, *A. Thomsoni*, *A. megapotamicum* (*A. vexillarium*), and the variety *variegatum*, and *A. Sellowianum marmoratum*, being very attractive. *Albizzia* (*Acacia*) *lophantha* is a handsome plant for mixed Sub-tropical Bedding; it is of quick growth, and produces an abundance of graceful bipinnate leaves. Cannas are splendid plants, admirably adapted either for massing in Beds by themselves or for mixing amongst other subjects; they are of stately growth. Numerous hybrids are now grown, most of which have been reared by M. Crozy, of Lyons. Madame Crozy, Paul Bert, and Ménélik are very effective. Daturas are handsome massive-foliaged plants with large trumpet-shaped flowers, and are much admired. The best kinds are *D. ceratocaula*, *D. Cornucopiæ*, and *D. meteloides* (*D. Wrightii*).

Eucalyptus globulus is a fast-growing subject, having leaves of a peculiar glaucous hue. The well-known *Ficus elastica* is suitable either for mixing in groups of tall-growing plants, or for planting amongst dwarf carpeting plants. *Grevillea robusta* is a most graceful plant, with fern-like foliage. *Humea elegans*, *Lavatera arborea variegata*, *Melianthus major*, Nicotianas, Ricinus, several of the strong-growing Solanums, like *S. marginatum*, *S. robustum*, and *S. Warscewiczii*, the bold Wigandias, *W. macrophylla* (*W. caracasana*), *W. urens*, and *W. Vigieri* may be effectively used.

Carpet Bedding.—This style of Summer Bedding is gradually disappearing. Carpet Bedding, as practised years ago, consisted of the planting of Beds in geometrical form with various dwarf coloured-foliaged plants, the object being to imitate fancy designs, such as were found on Turkey carpets, &c., and to work them out in different colours. The dwarf plants so used needed constant attention with regard to pinching and keeping them within their allotted space, or the design would quickly be spoiled by the strong growers running into and smothering the weaker subjects, and the Bed present the appearance of disorder and neglect. At the present day a decided improvement in the art of Carpet Bedding is to be seen in many of our large public parks and other places: this consists of a freer use of tall, graceful subjects, suitable for associating with the typical Carpet Bedding plants; and in this way many pleasing effects are produced.

Carpet Bedding should not be done until about the middle of June. The Beds ought to have been dug over about a fortnight previously and left to solidify; they will then only require to be made moderately firm, and to have the surface-soil raked smooth and even at the time of planting. The design is then transferred to the Beds by drawing lines in the soil. Circles may easily be drawn by fixing a stick firmly in the centre of the Bed, and looping a piece of string over it; then by attaching another stick to the string at the distance required, the circles may be drawn correctly. When all the lines are drawn they are traced with a little dry silver-sand, so as to make them more distinct for the operator. Planting then commences: the tall dot-plants are put in first, then the leading lines, and afterwards the intermediate spaces or panels are filled in.

Bedding Plants—*continued.*

As the majority of the plants are very small, and have to be planted quite close together, a narrow, pointed trowel is used; or the trowel may be dispensed with altogether and the work done with the fingers. The soil is made fairly firm around them, and a good watering given immediately after planting. If dry, hot weather sets in, the Beds must have occasional waterings throughout the summer. The dwarf plants will also require pinching at frequent intervals so as to keep them dwarf.

Irrespective of the popular carpeting plants mentioned below, there are numerous others belonging to the Sub-tropical and ordinary Summer Bedding class that are available either as dot or centre plants in connection with Carpet Bedding. Of these, the following may be mentioned: *Abutilon Thomsoni*, Agaves, *Fatsia* (*Aralia*) *japonica*, Centaureas, Coleus, *Dracæna australis*, Iresines, Perillas, and Yuccas.

The following list of plants includes the best of those most commonly grown for Carpet Bedding. The Saxifrages, Sempervivums, and Echeverias may be allowed to flower if it is desired; but generally the flowers are pinched out. All the other plants are grown exclusively for their foliage.

Alternantheras are largely used for filling in panels, divisional lines, &c. Several species and varieties are grown: *A. amabilis*, *A. amœna*, *A. versicolor*, *A. paronychioides*, *A. aurea nana*, *A. magnifica*, *A. major*, *A. m. aurea*, and *A. rosea nana*. *Antennaria tomentosa* or *A. candida* is largely used for edgings or divisional lines. *Calocephalus* (*Leucophyton* or *Leucophyta*) *Brownii* is used for filling in panels, &c. *Centaurea ragusina compacta* is very useful for Ribbon Bedding, a style which consists of filling a border the whole length with rows of plants, each row being of a different shade of colour, so that the border, especially when viewed from a distance, presents the appearance of a ribbon. It is also used as a dot-plant. *Cerastium tomentosum* is used for edgings, for filling in panels, &c. *Chamæpeuce Casabonæ* and *diacantha* are largely used as dot plants in connection with Carpet Bedding, as well as for sub-tropical work. Echeverias are used for edgings, divisional lines, &c.; the flower-stems vary from 6in. to 12in. in height. *E. agavoides*, *E. metallica*, *E. Peacockii*, and *E. secunda glauca* are those most commonly grown. *Herniaria glabra* is a creeping plant of neat, close habit, suitable for filling in the groundwork. *Kleinia repens* is a succulent, used for divisional lines. *Mentha Pulegium gibraltarica* is a useful groundwork plant, very effective when surrounded with brighter colours. *Mesembryanthemum cordifolium variegatum* is used for filling in panels, &c. *Pachyphytum bracteosum* is an attractive succulent, forming a useful dot plant, or for dividing lines. *Sagina pilifera aurea*, or *glabra aurea*, is an excellent subject for filling in panels. *Santolina incana* is useful as a dot plant. Saxifragas are excellent carpeting plants, for either Summer or Spring Bedding. Sedums, like *S. glaucum* and *S. lydium*, are used for panels. Sempervivums are very useful for forming divisional lines, &c. *Stellaria graminea aurea* is a bright carpeting plant for dividing lines or for filling in panels.

The designs furnished will give the gardener a fair idea of how the above-mentioned plants may be utilised in the present system of Carpet Bedding. As individual tastes differ, however, so the arrangements of the dwarf plants may be altered accordingly, and the tall plants may or may not be used, as fancy dictates. If the Beds are small, it will not be advisable to include too many dot-plants, but

Bedding Plants—*continued.*

hard-and-fast rules cannot be laid down, and in such cases the planter must use his own judgment. In some Beds it is well to have the central portion raised from 6in. to 12in. above the outside portion, the edge being planted with Echeverias or *Sempervivum tabulæforme*. This may easily be done in the Beds H and I (Figs. 149 and 150), and will greatly enhance their beauty.

FIG. 142. DESIGN FOR CARPET BED (A).

In Bed A (Fig. 142), No. 1 might have a centre plant of *Grevillea robusta*, and be carpeted with *Echeveria Peacockii*; No. 2 with *Sempervivum montanum*; No. 3 with *Leucophyta Brownii*; No. 4 with *Alternanthera versicolor*, having a dot-plant of Grevillea at the centre of each panel; No. 5 with *Alt. paronychioides*; No. 6 with *Alt. aurea nana*; No. 7 with *Alt. major*; No. 8 a dot-plant of *Santolina incana*, carpeted with *Alternanthera amabilis*; No. 9 should be filled in with *Mesembryanthemum cordifolium variegatum*; and No. 10 with *Alternanthera magnifica*.

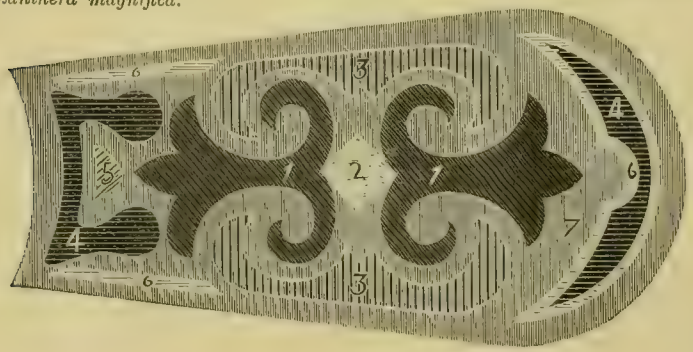


FIG. 143. DESIGN FOR CARPET BED (B).

Bedding Plants—*continued.*

In Bed B (Fig. 143), the panels numbered 1 might be filled in with *Alternanthera amœna*, and have a small plant of *Albizzia (Acacia) lophantha* inserted near the end furthest away from the centre of the bed; No. 2 would look well with a centre plant of *Cordyline (Dracæna) australis*, or any other tall, graceful-foliaged plant, carpeted with *Echeveria secunda glauca* or *Leucophyta Brownii*; panels numbered 3 might have dot-plants of Dracænas at their centres, and also one near each end, carpeted with *Alternanthera magnifica*; panels marked 4 with *Alt. versicolor* and a dot-plant or two of *Echeveria Peacockii*; No. 5 with *Alt. rosea nana*; and the portions marked 6 with *Alt. aurea nana*; the groundwork (No. 7) might then be filled in with *Herniaria glabra* or with one of the Mossy Saxifrages.

In Bed C (Fig. 141), No. 1 should be filled in with Mesembryanthemum, and have a plant of *Albizzia lophantha* at the centre of the heart; No. 2 with *Alternanthera major aurea*; No. 3 with *Alt. magnifica*, having a dot-plant of Acacia in the centre of each; No. 4 with *Sagina (Spergula) pilifera aurea*; those outside the panels numbered 6 should each have a plant of Chamæpeuce in the centre; No. 5 should be filled in with *Leucophyta Brownii* or *Antennaria tomentosa*, having a dot-plant of Acacia in the centre: No. 6 with *Pachyphytum bracteosum*, also having an Acacia in the centre if the bed is made large enough to allow of it without overcrowding; the groundwork (No. 7) should consist of Herniaria or one of the Sedums.

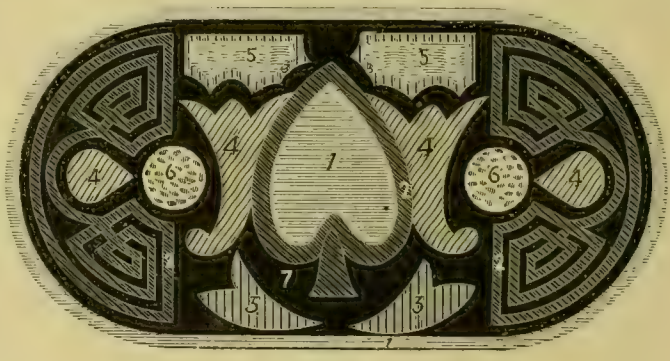


FIG. 144. DESIGN FOR CARPET BED (C).

In Bed D (Fig. 145), No. 1 might be filled with *Alternanthera magnifica*; No. 2 with *Alt. versicolor*; No. 3 with *Alt. amœna*; Nos. 2 and 3 should also have a centre plant of *Ficus elastica*, *Fatsia japonica*, or a small Palm; No. 4 should be filled in with specimen dot-plants of Coleus, Perilla, Iresine, Centaurea, Santolina, &c., planted in opposite pairs; No. 5 should be filled with Mesembryanthemum, and lined with *Kleinia repens*; No. 6 with *Sagina pilifera aurea*; No. 7 with Mentha; and the groundwork (No. 8) with *Antennaria tomentosa*, *Sedum glaucum*, or *Sedum lydium*.

In Bed E (Fig. 146), No. 1 might be filled in with *Alternanthera major*, and No. 2 with *Alt. major aurea* or *Stellaria*

CHRYSANTHEMUMS:

1.—Yellow La Croix. 2.—Alice Carter. 3.—N.C.S. Jubilee.

Bedding Plants—*continued.*

graminea aurea; a row of from three to five plants of Chamæpeuce might be placed along the middle of Nos. 1 and 2. No. 3 might be planted with *Kleinia repens*, No. 4 with *Alternanthera amœna*, and No. 5 with *Alt. amabilis* or *Alt. magnifica*, having centre plants of Chamæpeuce. The groundwork (No. 6) might be filled with Mentha, Herniaria, Antennaria, or one of the Sedums. If the bed is of sufficient size, *Eucalyptus globulus* might be substituted for the plants of Chamæpeuce.

In Bed F (Fig. 147), panel No. 1 might be filled with *Alternanthera amœna*; No. 2 with *Echeveria secunda glauca* or *E. agavoides*; No. 3 with *Cerastium tomentosum* or *Sagina pilifera aurea*; No. 4 with *Iresine Lindeni*; No. 5 with *Alternanthera major*; No. 6 with *Alt. aurea nana*; and the groundwork (No. 7) with Mesembryanthemum. If dot-plants are required for this Bed, specimens of Dracæna, Grevillea, or *Albizzia lophantha* might be inserted in the centre of Nos. 1, 4, 5, and 6.

In Bed G (Fig. 148), No. 1 should consist of a small specimen Yucca or Dracæna; No. 2, *Echeveria Peacockii*, edged with *Sempervivum montanum*; No. 3, *Alternanthera amœna*; No. 4, *Pachyphytum bracteosum* or *Leucophyta Brownii*; No. 5, *Antennaria tomentosa* or *Alternanthera major aurea*; No. 6, *Alternanthera versicolor*; No. 7, Mesembryanthemum; No. 8, Mentha; No. 9 with *Pyrethrum* Golden Feather. The centres of Nos. 4 and 5 should consist of small specimen Palms; whilst the centres of the panels 7 and 8 might, with advantage, have plants of Coleus, Perilla, or Iresine inserted. All the panels should be raised and bevelled off, the central cross of *Echeveria Peacockii* being raised still further, and the *S. montanum* planted on the sides. A nice plant of Chamæpeuce may be planted in the centre of the panels No. 6.

In Bed H (Fig. 149), No. 1 might be filled with *Kleinia repens*, having a centre plant of *Fatsia japonica*; No. 2 with *Alternanthera versicolor*; No. 3 with *Alt. paronychioides*, having a small plant of *Ficus elastica* at each of the four corners; No. 4 with Mentha; No. 5 with *Echeveria secunda glauca*; No. 6 with *Alternanthera amœna*, having centre dot-plants of *Centaurea ragusina compacta* or *Santolina incana*; No. 7 with *Alternanthera aurea nana*; No. 8 with *Echeveria metallica*; No. 9 with *Cerastium tomentosum*, having dot-plants of Iresine in the centre; No. 10 with Mesembryanthemum; No. 11 with *Alternanthera major aurea*, having dot-plants of Chamæpeuce; No. 12 with Antennaria or Spergula, interspersed with *Sempervivum tabulæforme* or *S. triste*. The beauty of the Bed will be improved if the whole of the central portion from No. 5 inwards is raised about 8in., and the Echeveria planted in a double row on the edge.

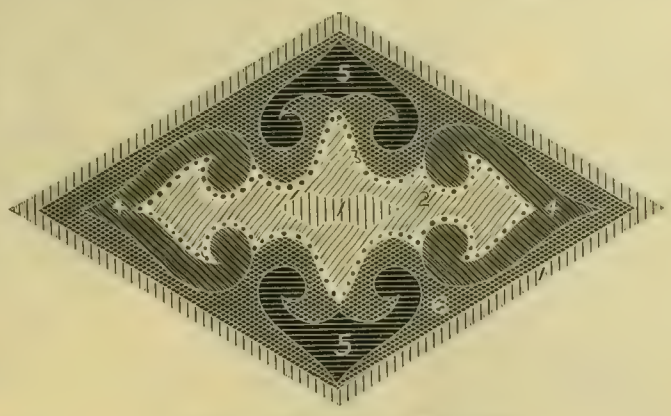


FIG. 146. DESIGN FOR CARPET BED (E).

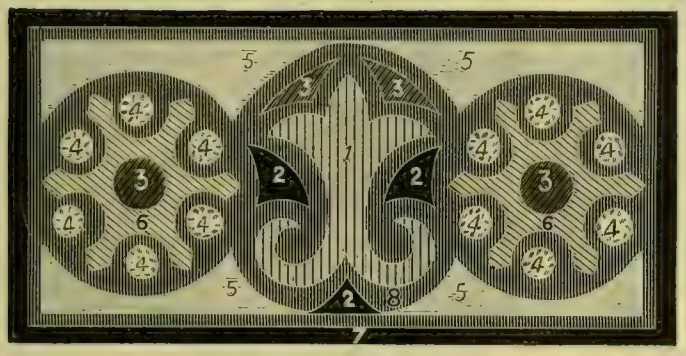


FIG. 145. DESIGN FOR CARPET BED (D).

In Bed I (Fig. 150), No. 1 should have a centre plant of *Grevillea robusta* or *Eucalyptus globulus*, and be carpeted with *Alternanthera magnifica* or *Alt. versicolor*; No. 2 would be best filled in with Mesembryanthemum or *Sagina pilifera aurea*; No. 3 with Herniaria or Mentha; No. 4 with *Alternanthera major*; No. 5 with *Alt. rosea nana*; and No. 6 with *Alt. aurea nana*. The three outside panels numbered 5, and also the three outermost numbered 6, might each have a specimen plant of Grevillea in the centre; or those numbered 5 would look well with a plant of Chamæpeuce in the centre, and those numbered 6 with one of Coleus.

In Bed J (Fig. 151), No. 1 might be filled in with

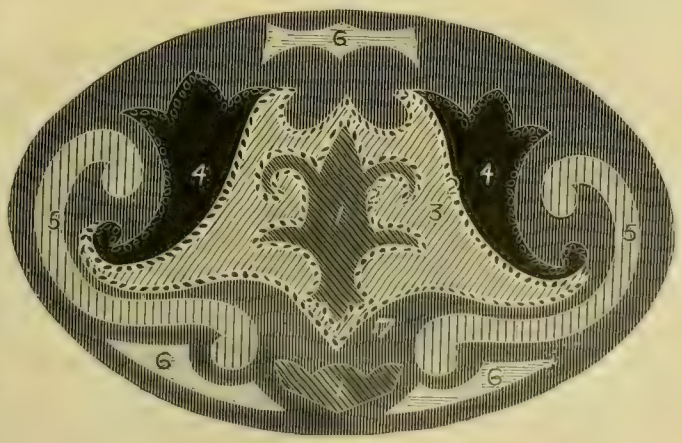


FIG. 147. DESIGN FOR CARPET BED (F).

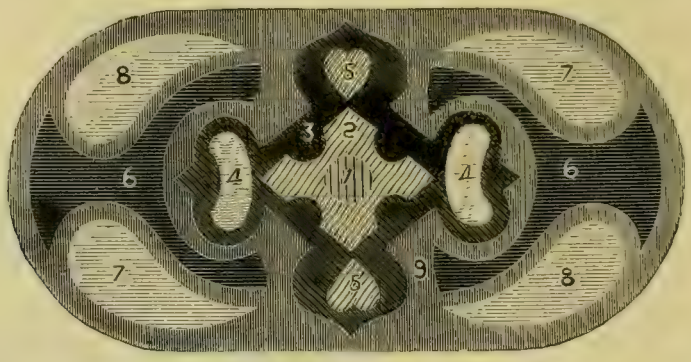


FIG. 148. DESIGN FOR CARPET BED (G)

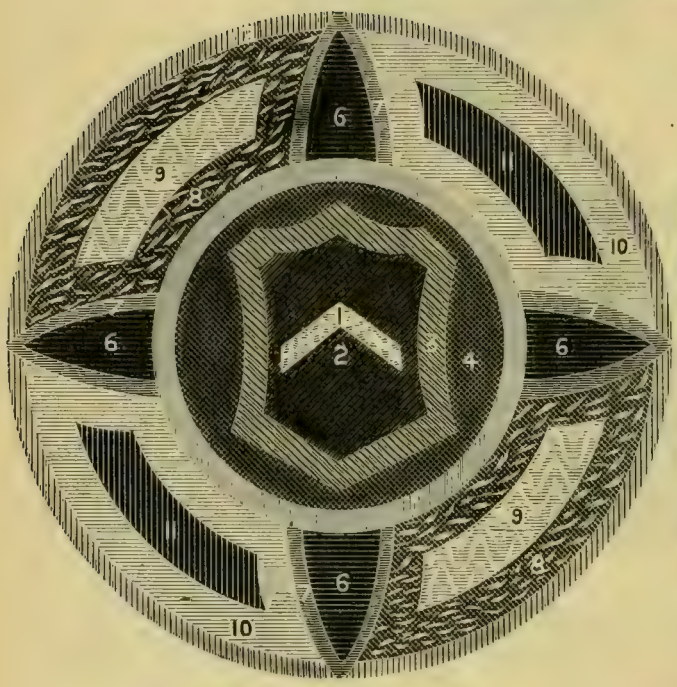


FIG. 149. DESIGN FOR CARPET BED (H).

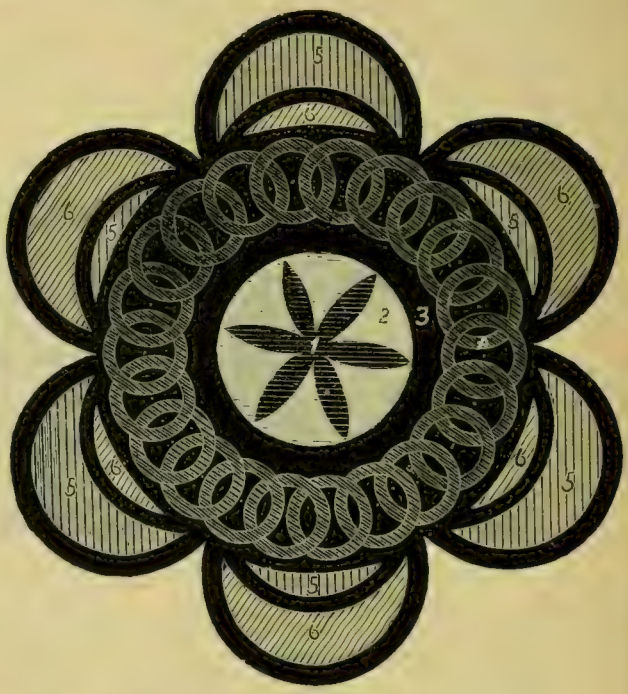


FIG. 150. DESIGN FOR CARPET BED (I)

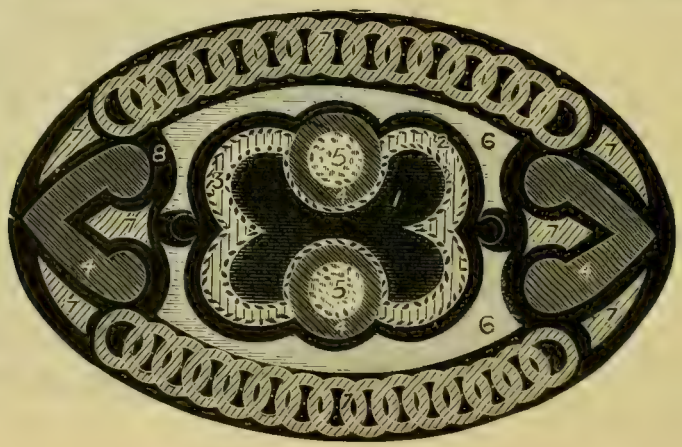


FIG. 151. DESIGN FOR CARPET BED (J)

Bedding Plants *continued.*

Iresine or *Alternanthera paronychioides*; No. 2 with *Echeveria secunda glauca*; No. 3 with Mesembryanthemum; the panels numbered 4 might be planted with *Alternanthera amœna*, and have a plant of *Abutilon Thompsoni* in the round portions at each end of the panels.

FIG. 152. DESIGN FOR CARPET BED (K).

Bedding Plants—*continued.*

In Bed K (Fig. 152), panel No. 1 might be planted with *Alternanthera aurea*, having a centre plant of Perilla; No. 2 with *Alt. amœna*; while the top and the two lower No. 2 panels might each have a centre plant of Chamæpeuce; No. 3 with *Alternanthera versicolor*, having centre

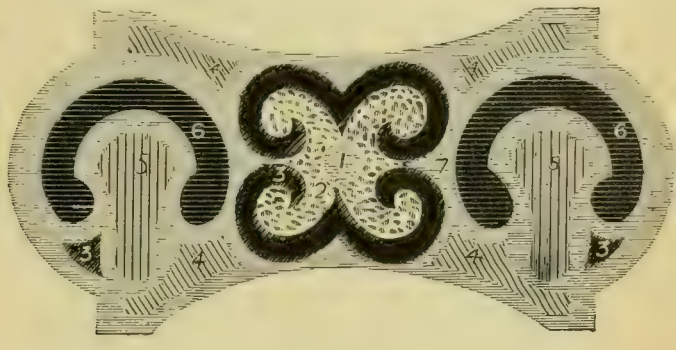


FIG. 153. DESIGN FOR CARPET BED (L).

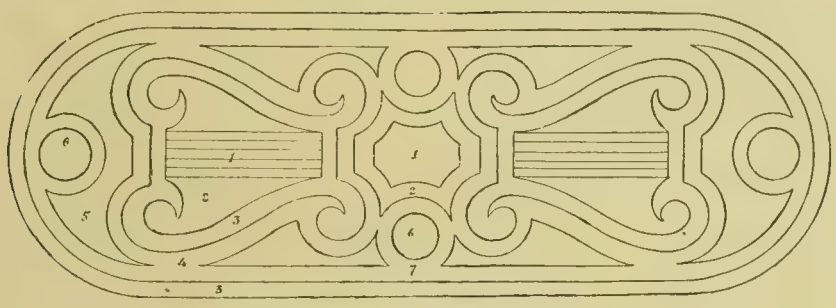


FIG. 154. DESIGN FOR CARPET BED (M).

FIG. 155. DESIGN FOR CARPET BED—FRENCH (N).

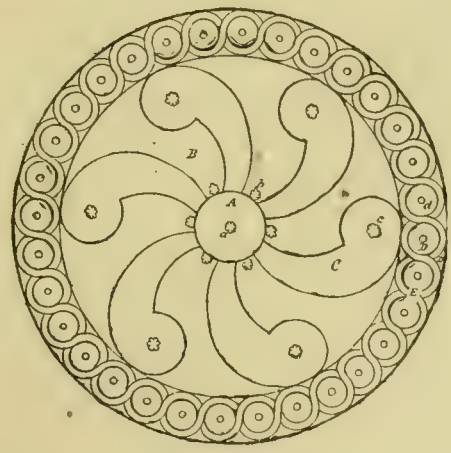


FIG. 156. DESIGN FOR CARPET BED (FRENCH—AFTER MANNRENÉ) (O).

The number 5's should each have a centre plant of Abutilon, and be carpeted with *Pachyphytum bracteosum*; No. 6 with *Alternanthera versicolor*; No. 7 with *Alt. major aurea* or *Alt. aurea nana*; the groundwork (No. 8) being carpeted with Mentha, Herniaria, Antennaria, or *Sedum glaucum*.

plants of Centaurea; No. 4 with *Alternanthera magnifica*; No. 5 with specimen dot-plants of Perilla; the groundwork (No. 6) might be filled in with Mentha, Herniaria, Antennaria, or Stellaria.

In Bed L (Fig. 153), No. 1 should be planted with a specimen Dracæna or Aralia; No. 2 with *Echeveria*

Bedding Plants—*continued.*

Peacockii; No. 3 with *Alternanthera amœna*; No. 4 with *Alt. aurea nana*, having centre plants of Iresine; No. 5 with *Alt. magnifica* or *Alt. rosea nana*, having centre plants of *Albizzia lophantha*; No. 6 with *Alternanthera versicolor* or *Alt. major*; the groundwork (No. 7) with Mentha, Mesembryanthemum, Antennaria, Herniaria, or Sedum. The central panel might be nicely moulded from a slightly-raised centre to the edges.

In Bed M (Fig. 154), No. 1 might be filled with *Pachyphytum bracteosum*; No. 2 with *Alternanthera paronychioides major*; No. 3 with *Alt. p. m. aurea*; No. 4 with *Herniaria glabra*; No. 5 with *Alternanthera amœna*; No. 6 with *Mesembryanthemum cordifolium variegatum*; and No. 7 with *Pachyphytum roseum*.

In Bed N (Fig. 155), A should have a centre plant of *Yucca aloifolia*, surrounded with *Cineraria maritima candidissima* (B); C should be planted with *Ageratum Wendlandii*; D, with Coleus Golden Gem; E, with *Ageratum mexicanum nanum*; F, with *Lobelia Erinus compacta*; G, with *Antennaria dioica*; H, with *Alternanthera paronychioides*; and I, with *Ageratum mexicanum nanum*.

In Bed O (Fig. 156) there should be a central plant of *Livistona australis* at *a*, surrounded by *Amarantus melancholicus ruberrimus* (A); at *b*, *Fatsia papyrifera*; at *c*, *Dracæna Draco*; and at *d*, *Echeveria gibbiflora*; B should be filled with *Tagetes* Legion of Honour; C, with *Ageratum mexicanum nanum*; D, with *Iresine Lindenii*; and E, with *Lobelia Erinus compacta*.

FIG. 157. DESIGN FOR CARPET BED (P).

Fig. 157 (P) may be utilised for either a Carpet or a Decorative Bed. If the former, there should be a *Phœnix dactylifera* as a central plant at A, surrounded by *Begonia Worthiana*; *a* should be filled with Lobelia Cobalt Blue; *b*, with *Alternanthera paronychioides*; *c*, with *Mesembryanthemum cordifolium variegatum*; *d*, with *Echeveria metallica*; *e*, with *Mentha Pulegium gibraltaricum*; *f*, with *Dracæna gracilis*; *g*, with *Alternanthera amœna*; *h*, with *Pyrethrum aureum selaginoides*; *i*, with *Cerastium tomentosum*.

Bedding Plants—*continued.*

A pretty Decorative Bed for P could be composed as follows: A, *Yucca filamentosa*; *a*, Pelargonium Black Douglas; *b*, Pelargonium Harry Cox; *c*, Pelargonium Vesuvius; *d*, Lobelia Blue Beauty; *e*, Pyrethrum Golden Feather; *f*, *Begonia Worthiana*; *g*, *Alternanthera paronychioides magnifica*; *h*, *Iresine Lindenii*; *i*, *Mesembryanthemum cordifolium variegatum*.

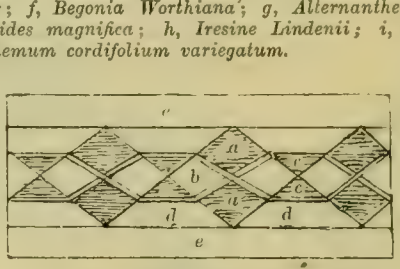


FIG. 158. DESIGN FOR CARPET BED (Q).

At Bed Q (Fig. 158), *a* may be filled with *Echeveria secunda*; *b*, with *Sempervivum montanum*; *c*, with *Sempervivum calcareum*; *d*, with *Echeveria secunda*; and *e*, with *Oxalis tropæoloides* (of gardens).

Spring Bedding consists in planting Beds in the autumn with bulbs and hardy herbaceous subjects for an early spring display. When the Summer Bedders have lost their beauty, and no longer present an attractive appearance, they are removed—those that are required for next season's display are placed in their winter quarters, whilst the others, such as Pelargoniums, from which an ample stock of cuttings have been procured, are thrown away. It is then usual to dig over the Beds, and plant immediately with the spring-flowering subjects; this is generally done in September and October—the sooner the better—so that the plants may be well established before winter sets in.

Bulbs play a very important part in the decoration of the Beds in spring. For this purpose they should be procured as soon as convenient in the autumn, those known as "Dutch bulbs" being inserted as soon as they arrive from the Continent, if the best results are to be obtained. They answer splendidly either grown in Beds by themselves or mixed with other spring-flowering subjects, such as Polyanthuses, &c. After flowering they must be removed, so as to make room for the Summer Bedders, and this very often, if not always, has to be done before the foliage has died down, in which case they must be laid close together in Beds in the reserve garden or in damp ashes, &c., to thoroughly ripen off.

The varieties of these subjects are very numerous, and it will not be necessary to mention them here, as large quantities may be procured from our various seedsmen, either in named varieties or in mixed sorts. The catalogues generally give the colour of each kind.

Hardy annuals are also used for Spring Bedding; these are obtained from seed sown in July or August in the reserve garden, transplanting the seedlings when large enough, so as to make fine strong plants for transferring to their permanent positions in September and October.

The hardy perennials, when removed from the Beds in spring, are planted in the reserve garden, there to have every attention as regards watering, weeding, &c., until required for transferring to their flowering quarters again

Bedding Plants—*continued.*

in the autumn. Propagation is generally effected by division of the old plants when transplanting, in either the spring or the autumn. Large numbers may also be raised from cuttings or from seeds.

The arrangement of the plants in the Beds is an item which demands attention, if good results are to be obtained; but in this matter each individual has his own particular fancy, and excellent effects are produced by blending and contrasting colours in a variety of ways. It is a mistake to aim at too much in a single Bed, two or three colours being quite sufficient to produce a charming display. In planting round Beds it is a general rule to do so in circles, using first one colour and then another, alternately, say, a circle of white Arabis, then one of yellow Alyssum, and then one of the blue Myosotis. Excellent effect is, however, obtained by filling Beds with distinct families of plants; for instance, a Bed filled with mixed Polyanthuses in various shades of colour proves very attractive; Wallflowers might also be used in a similar way.

The following are the most important of the spring-flowering subjects suitable for Bedding:

Alyssum saxatile compactum contrasts charmingly with the white Arabis and blue Aubrietia; *Anemone blanda, A. apennina*, and *A. coronaria; Arabis albida; Aubrietia deltoidea, A. Campbelli, A. græca*, and *A. Leichtlinii;* Daisies; Erysimums; *Iberis sempervirens, I. s. Garrexiana*, and *I. gibraltarica; Myosotis dissitiflora; Phlox amœna* and *P. subulata; Silene pendula, S. compacta*, Snow King, and Amelia; and Wallflowers.

Winter Bedding is very little practised, it usually being the custom to fill the Beds with bulbs and other hardy subjects in the autumn for spring display, and the consequence is that throughout the dull dark days of winter the Beds present a very bare and uninteresting appearance. When they are at some distance from the house, or in parts of the garden little frequented in winter, this prevailing bareness does not matter much; but when the Beds are on the lawn immediately in front of the house, as is often the case, it is evident that they ought to be filled with plants of some sort, so as to make a show during the winter.

Taking into consideration that the Beds are required for summer occupants, and therefore cannot be planted with permanent subjects, it is obvious that those selected to fulfil the requirements of Winter Bedding must be such that will bear transplanting well, and at the same time they must be perfectly hardy. The plants that possess these essentials are undoubtedly our hardy evergreen shrubs and small Conifers, and seeing what a wealth of these subjects are now in our possession, it is a pity that they are not more used for the decoration of Beds in winter. Of course, if Spring Bedding is to be adopted in its entirety, Winter Bedding is impossible; but why not come to a compromise between the two systems, and have a little of both? For instance, some of the Beds might be filled with hardy evergreens, and the remainder with Spring Bedding Plants; the effect would then be materially improved for during the winter the evergreens would enliven the scene to a certain extent, whilst in the spring, when they were making their new growth, and the Spring Bedders were at the zenith of their beauty, the effect would be charming. If the evergreens are grown in pots for this purpose, it is only necessary to plunge them in the Beds in the autumn, and to remove them in the spring. The best place for them during the summer is in the reserve garden, plunging them in soil or ashes, and taking care that they do not suffer for want of water. Growing in pots is a good method, for, their roots being restricted, they do not grow so freely, and they are, therefore, available for service for a much longer time than those planted out.

If the evergreens, however, are planted out in the Beds, the greatest care must be taken in planting and replanting,

Bedding Plants—*continued.*

or they will suffer by the somewhat harsh treatment to which they are subjected by being lifted twice a year. They should be planted in the late autumn and removed again about April. It is not advisable to defer lifting and transferring to their summer quarters later than is absolutely necessary, as the plants ought to be established before the hot, scorching days of summer set in. The best plan is to plant them carefully in a somewhat shaded border in the reserve garden, the only attention necessary during the summer being that of watering, keeping clean, &c.

The following list of Conifers includes most of those suitable for Winter Bedding: *Cryptomeria japonica elegans* and variety *nana; Cupressus nootkatensis* (*Thuyopsis borealis*) and variety *compacta; Cupressus Lawsoniana* and its many varieties, including *argentea, compacta, nana, albo-picta*, &c.; *Cupressus obtusa* and varieties *aurea, nana-compacta*, &c.; *Cupressus pissifera* and varieties *plumosa, p. aurea, squarrosa*, &c. (the two last-mentioned species and their varieties are generally known in gardens under the name of Retinosporas); *Cupressus thyoides* (*Chamæcyparis sphæroidea*); the dwarf varieties of *Picea excelsa* (Norway Spruce); *Taxus baccata aurea* and *elegantissima*, also *fastigiata* (the Irish Yew); *Thuya occidentalis* (the American Arbor-Vitæ) and its varieties *aurea, erecta-viridis, globosa*, &c.; *Thuya orientalis* (Chinese Arbor-Vitæ) and its varieties *aurea compacta, elegantissima, semperaurescens*, &c. (these are generally known as Biotas). Those known as Retinosporas and Biotas are decidedly the best of the Conifers for Winter Bedding.

A large number of our hardy evergreen shrubs are also suitable for Winter Bedding, of which the following might be mentioned: Aucubas; *Berberis Aquifolium* (generally known as *Mahonia Aquifolia*) and *B. Wallichiana*; *Buxus* (Box) in variety; *Euonymus japonicus* and *radicans variegata*; Hollies, in variety; Ivies (the different forms of Tree-Ivy); Laurels (especially the Portugal); Laurustinus; Osmanthus (a dwarf Holly-like plant); Pernettyas; Phillyreas; Skimmias; &c. The variegated Euonymus and variegated Tree-Ivies are the showiest of the evergreen shrubs, and may be used with excellent effect in combination with any of the other subjects mentioned; the former is an excellent edging plant.

As a rule, it is best to keep Beds of mixed Conifers distinct from those of shrubs, but such plants as the Yew will be quite at home in either combination, and Beds devoted to the Yew and Osmanthus, with an edging of variegated Euonymus, present a very cheerful appearance during winter.

It is not necessary to confine Winter Bedding strictly to the planting of Conifers and evergreen shrubs, for many other hardy evergreen plants, such as the large-leaved Saxifrages or Megaseas, may be used with equal effect; but enough has been said to show that there is no dearth of subjects suitable for this much-neglected style of Bedding.

BEEF-STEAK FUNGUS (*Fistulina hepatica*). This liver-coloured Fungus is found growing upon living Oaks, and according to Hartig is responsible for a "deep red-brown decomposition in the wood." It is edible and very delicious.

BEEF-SUET TREE. *See* **Shepherdia argentea.**

BEERA. A synonym of **Hypolytrum** (which *see*).

BEET. The following additional varieties in their respective sections may be recommended. *Pyriform:* Cheltenham Green-top, Dell's Black-leaved, Gem, Johnson's Selected, Maincrop, Middleton Park, Pragnell's Exhibition, and Zulu. *Round or Egyptian Turnip-rooted:* Edmund's Blood Red, Egyptian Dark Red, Veitch's Eclipse, and Turnip-rooted Red Globe. *Spinach or Perpetual:* Silver or Seakale, Spinach or Green Perpetual. Both these varieties are useful in dry seasons when the Spinach runs to seed quickly, as the leaves make an excellent

Beet—*continued.*

substitute for that vegetable. *Bedding:* Black Selected, Dell's Black-leaved, Dracæna-leaved, and Zulu. The Chilian Beet is excellent for sub-tropical bedding, as the foliage is massive, with large, prominent, highly-coloured midribs. Seeds may be sown where the plants are intended to remain at the end of April.

BEETHOVENIA. A synonym of **Ceroxylon** (which *see*).

BEETLES (*Coleoptera*). Though the individuals which go to make up this vast Order cannot be said to possess the intelligence exhibited by certain *Hymenoptera*—Ants, Bees, and Wasps, for example—the gorgeous colours of many Moths and Butterflies (*Lepidoptera*), or the high organisation of the insects comprising these Orders, or even the *Diptera* (Flies), yet they are numerically the strongest of all insects, are extremely diverse as to habits, and world-wide as to their distribution. The number of species is put down at 150,000, of which 3300 belong to Britain alone. The life-history of Beetles generally is but little understood, as frequently their habits are such as to preclude close investigations being made. Much, therefore, with regard to the larval and pupal stages, yet remains to be discovered.

The majority of Beetles are capable of flight, although they are not so often recognised upon the wing as Moths and Butterflies; but there are many which are quite unable to fly. In the latter case the membranous hind-wings are either very rudimentary or altogether wanting, and usually the horny fore-wings (elytra), which fit so beautifully along the centre of the back, are "fused" together, or "soldered." Occasionally the wings are wanting, as in the soft-bodied female Glowworm, while the male is amply provided (see Fig. 159). Beetles, too, which are incapable of flight, generally run very rapidly—Ground Beetles for instance; while others both run and fly with great rapidity, as is the case with the Tiger Beetles.

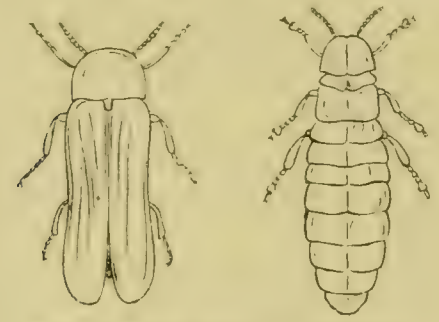


FIG. 159. MALE AND FEMALE GLOWWORMS.

The larvæ, or grubs, of Beetles are rarely seen, compared, say, with those of Butterflies and Moths. Speaking generally, they are made up of a head, three thoracic segments, either nine or ten abdominal segments, nine pairs of spiracles, and frequently a peculiar protrusion at the anal extremity of the body. Some, like those of the Ground Beetles and the Tiger Beetles, are very active, and all are wonderfully adapted to the kind of life they have to lead. Wood-feeding larvæ (which are well protected) are soft-bodied, hard-headed creatures, with exceptionally strong jaws; and so, too, are the larvæ of certain Beetles living under the soil protected—Cockchafers, Rose-chafers, and the like. Then there are others which feed exposed, like the larvæ of the well-known Ladybirds.

Beetle larvæ differ markedly as regards the length of time they remain in that condition. Wood-feeders—of which the Musk Beetle, Stag Beetle, and Bark Beetles

Beetles—*continued.*

are familiar examples—take several years. Again, the ubiquitous Wireworms are two years at least as larvæ. Occasionally two distinct forms of larvæ are evolved from the same individual; this is known as hypermetamorphosis, and it is met with in the very abundant Pea Weevil (*Bruchus pisi*). The young larvæ of this are very different-looking animals from the older grubs. The former possess three pairs of legs; but these are lost after the larvæ enter the pea-seed, and approach the full-fed condition. As the young larvæ of the Pea Beetle have to penetrate both pod and seed of their food-plant, these legs, as well as the cutting spines found upon the pronotum, aid them considerably. A still more interesting example is the young larva of the soft-bodied, sluggish indigo-blue Oil Beetle (*Meloe*). It is an insect capable of running, and may be found in Buttercups and other flowers in summer awaiting the arrival of certain bees, to which the larvæ attach themselves, and are carried to the nests. Once there, they feed first upon the eggs and afterwards upon the stored honey. While with the bees they undergo several changes: at one time they possess short legs, which, by a gradual process, are reduced to mere tubercles, and then finally disappear. There are four moults, and, except for a short time between one of them (when the jaws are rendered quite useless), the grubs feed upon the honey.

The pupal stage of Beetles is variously passed. Commonly a cocoon is elaborated from the food-plant and the soil, and in this it is assumed; or it may be passed merely in a hollowed-out place in the soil. Ladybirds, however, differ considerably in this respect; they remain suspended by the tail to the food-plants. The duration of this stage of Beetles cannot be fixed with certainty, and it may be anything from a week or ten days to a month or less. Frequently the perfect insects—Cockchafers in particular—remain beneath the soil some considerable time before finally emerging, as at first all are soft-bodied, and destitute of any distinctive colour.

To enable the gardener to understand the external anatomy of Beetles, a dissection of the Stag Beetle is given, and the various parts are briefly explained (see Fig. 160).

As a rule, the several members of the great Order *Coleoptera* are destitute of an external covering of the nature of hairs or scales, and even if these are present, the former are usually few in number, while the latter are very small, and not easily to be distinguished separately without the aid of a lens. Owing to this fact, and the further one that Beetles are fairly typical insects, and contain in their ranks members of goodly proportions, it is not a difficult matter to make out the external anatomy of an insect in general, and of this order in particular, especially if one of the larger species be selected. The work, too, is still further facilitated through the external skeleton being firm, and therefore easily manipulated.

A first glance is sufficient to show that primarily the body of the insect has three great divisions, the anterior one being the head, and the next the thorax, while the abdomen brings up the rear. Each of these, however, is either sub-divided or possesses appendages, or is modified in both directions.

First, as to the head. On the upper surface (I., A.), *a* is the labrum, or upper lip; *b*, the clypeus; *c*, the vertex, or crown; *d*, the occiput. As appendages to this surface of the head, we find the antennæ (*e*) and the mandibles, or upper jaws (*f*).

Though extremely variable in length and appearance, the antennæ nearly always consist of eleven joints, the basal one being often long and the next one short. They are employed as sense-organs, though what particular sensations are received by their means is still somewhat problematic. The mandibles in the male of the Stag Beetle are enormously developed, and modified into a pair of powerful pincers, which the insect knows well how to

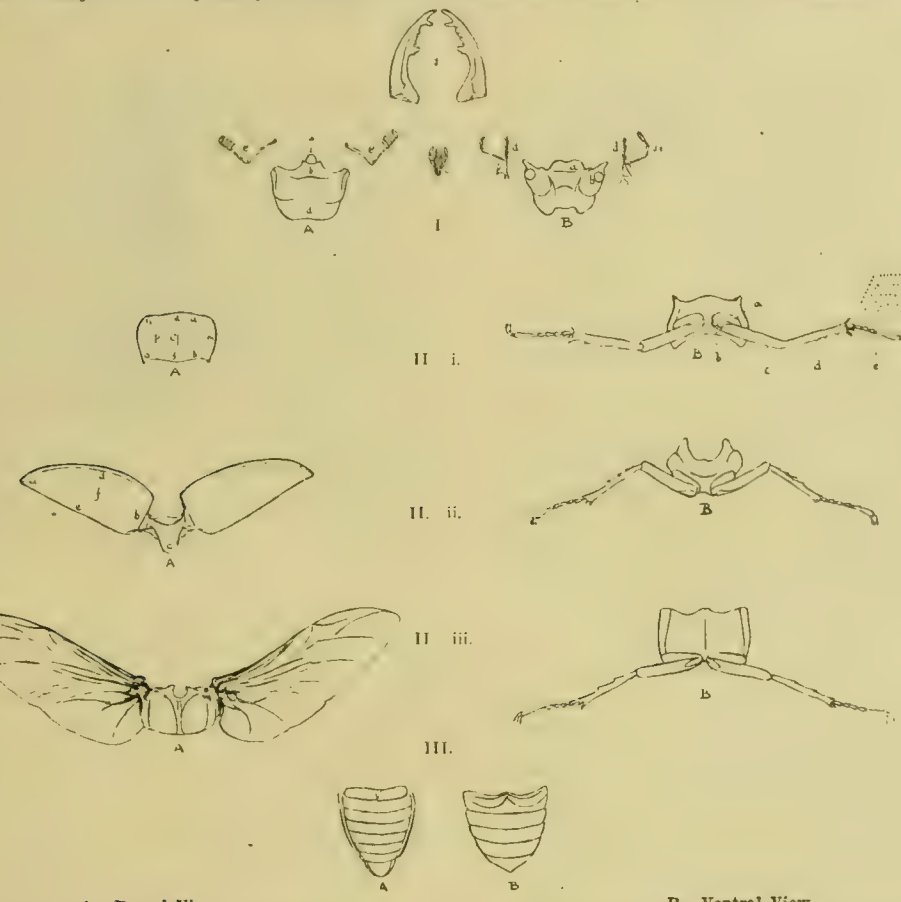
Beetles—*continued.*

use. Had *Dytiscus marginalis* been selected for dissection, the mandibles would have been found doing their proper duty as jaws—a duty which may easily be inferred also from an inspection of the head of the pretty Tiger Beetle (*Cicindela campestris*) or one of the Garden Beetles (*Carabus*).

Beetles—*continued.*

Of the lower surface (I. B.) of the head, *a* is the mentum, or chin, which, with the ligula and accompanying paraglossæ and labial palpi (*c*), forms the labium, or lower lip. *b* is the eye, and *d* are the maxillæ, or lower jaws, with their accompanying maxillary palpi (*d i*).

Passing now to the second division of the body—the



A.—Dorsal View. B.—Ventral View.

FIG. 160. DISSECTION OF EXTERNAL SKELETON OF STAG BEETLE (*Lucanus cervus*), SOMEWHAT REDUCED.

DESCRIPTION OF PLATE.

I.—**Head.**
- A. Dorsal surface.
  - *a.* Labrum.
  - *b.* Clypeus.
  - *c.* Vertex, or crown.
  - *d.* Occiput.
- B. Ventral surface.
  - *a.* Mentum.
  - *b.* Eye.

  The head bears:
  - *c.* Ligula, with paraglossæ and labial palpi.
  - *d.* Maxillæ, or lower jaws.
  - *d. i.* Maxillary palpi.
  - *e.* Antennæ.
  - *f.* Mandibles, or upper jaws.

II.—**Thorax.**—i. Prothorax. ii. Mesothorax. iii. Metathorax.
- i. A. **Pronotum.**
  - *a.* Anterior margin.
  - *b.* Posterior margin.
  - *c.* Medial line.
  - *d.* Apex.
  - *f.* Base.
  - *m.* Lateral margin.
  - *n.* Anterior angles.
  - *o.* Posterior angles.
  - *p.* Disc.
- i. B. **Prosternum,** bearing the fore or anterior pair of legs, having the following divisions:
  - *a.* Coxa.
  - *b.* Trochanter.
  - *c.* Femur.
  - *d.* Tibia.
  - *e.* Tarsus, with five joints, the last terminated by a pair of ungues, or hooks.
- ii. A. **Mesonotum,** bearing the two elytra, on which are:
  - *a.* Apex.
  - *b.* Base.
  - *c.* Scutellum.
  - *d.* Lateral margin.
  - *e.* Suture.
  - *f.* Disc.
- ii. B. **Mesosternum,** bearing the mid-pair of legs.
- iii. A. **Metanotum,** bearing the two wings.
- iii. B. **Metasternum,** bearing the two hind-legs.

III.—**Abdomen.**
- A. Dorsal surface.
- B. Ventral surface.

Beetles—*continued.*

thorax (II. A. and II. B.)—it is found divided into three rings, called respectively, i. the prothorax, ii. the mesothorax, and iii. the metathorax. In each case the dorsal surface is distinguished as the -notum and the ventral as the -sternum.

Of the pronotum (II. i. A.) (which is without appendages), *a* is the anterior, *b* the posterior, and *m* the lateral margin. *c* is the medial line, *d* is the apex, *f* the base, *n* the anterior, and *o* the posterior angles, while *p* is the disc.

Beneath the pronotum is found the prosternum (II. i. B.), carrying the fore or anterior pair of legs, each of which, like the other four, have the following divisions: *a*, the coxa; *b*, a very small joint, the trochanter; *c*, the femur; *d*, the tibia; *e*, the tarsus, with five joints (in this insect), the last terminating in a pair of ungues, or hooks, the use of which is very apparent if a Stag Beetle be held in the hand.

In II. ii. A. is seen the mesonotum; this carries the two elytra, hardened shell-like appendages, which are modified representatives of the fore-wings of other insects. On them are the apex, *a*; base, *b*; lateral margin, *d*; and disc, *f*. When the elytra are closed, the line along which they meet is called the suture, *e*; and a little triangular shield, the scutellum, *c*, is seen on the middle line at the anterior extremity of the suture.

The mesosternum (II. ii. B.) bears the mid pair of legs, whose divisions are the same as those of the fore pair.

II. iii. A. represents the metanotum carrying the membranous wings which, when the insect is at rest, are folded away very carefully beneath the elytra, so as to be out of danger. Beneath the metanotum is the metasternum, II. iii. B., bearing the hind pair of legs, whose parts are again the same as those of the fore-legs.

III. A. shows the dorsal surface of the abdomen, and III. B. the ventral, both being divided into a number of segments. The greater part of the dorsal surface in most Beetles is shielded by the elytra, and is therefore softer than the ventral surface, which has no protection.

Many attempts have been made, with more or less success, to classify the Beetles. Still, the fact remains that, even in the present state of knowledge, there are a vast number of forms which cannot well be brought together by any hard-and-fast system of classification, and these have been styled *Polymorpha*. It would serve no good purpose to minutely classify this vast Order. All that the gardener needs to know are the leading characteristics of the families containing either friends or foes, or both. To separate the one from the other is not by any means an easy matter, but unless he is able to discriminate somewhat, he may be destroying, unwittingly, some of his greatest friends.

Below are the leading characteristics of the families of Beetles most interesting to gardeners and farmers, arranged alphabetically.

Bruchidæ are small Beetles, several species of which are destructive to the seeds of leguminous plants. The head is produced in front, but not prolonged into a beak, and is partly hidden beneath the pronotum. The feet appear as if but four-jointed, but a fifth really exists. To this family belong the well-known Pea Weevil (*Bruchus pisi*), as well as the Bean Pests (*B. rufimanus* and *B. fabæ*), referred to under **Bruchus.**

Carabidæ, or **Ground Beetles.** These are closely related to the *Cicindelidæ*, chiefly differing from them in the face being narrower, and in the absence of a hinged hook to the first maxilla, and in the eyes being less prominent. By far the majority of them are useful in gardens, and as some few are amongst the commonest of Beetles their good qualities should not be overlooked. Fig. 161 represents *Carabus nemoralis*, which may be found

Beetles—*continued.*

FIG. 161. GROUND BEETLE *(Carabus nemoralis).* (Twice natural size.)

almost everywhere in town or in country. As the common name suggests they are largely terrestrial in their habits. Frequently they are incapable of flight, the elytra being soldered. Although not so predaceous as the Tiger Beetles, they will attack both living and dead insects; while the larvæ are also similarly useful and very active. In form the larvæ are elongate, possess very powerful calliper-like jaws, and the hind part of the body bears two peculiar processes and a mid-tube. In the genera *Harpalus*, *Pterostichus*, *Zabrus*, *Amara* ("Sunshiners"), and *Calathus*, are to be found individuals which occasionally forsake their usual carnivorous dietary for a vegetarian one. *Harpalus ruficornis*, *Pterostichus madidus* (Fig. 162), and *Calathus cisteloides*, all prey upon Strawberries; while *Zabrus gibbus* and several *Amara* are at least in part plant feeders, the former being destructive to corn.

FIG. 162. PTEROSTICHUS MADIDUS.

Cerambycidæ, or **Longhorn Beetles,** are very closely allied to the *Chrysomelidæ*. The species are, as a rule, elegant insects, of oblong form, and with usually long serrate or pectinate antennæ. The tarsi are five-jointed, though the fourth segment is with difficulty differentiated from the fifth. One of the most elegant representatives found in gardens is the sweet-smelling Musk Beetle (*Aromia moschata*) (Fig. 79), whose larvæ do much damage to Willows. The Longhorns generally are wood rather than garden-inhabiting Beetles. The grubs are soft, white, and fleshy, usually with short legs, small head, and powerful jaws. Some of these Beetles are capable of making a stridulating noise, the Musk Beetle among the number.

Chrysomelidæ, or **Leaf Beetles.** These are usually bright or metallic as to colour, and oval or convex as to form, but great variability in this latter respect is shown in

Beetles—*continued.*

this very large family. To it belong several of the most destructive insects found in gardens: the Turnip Flea Beetle (Fig. 133, Vol. IV.), the Colorado Beetle (Fig. 261, Vol. III.), the Asparagus Beetle, the Mustard Beetle, and the lovely, but scarce, Lily Beetle. The larvæ are fleshy, and, like the Beetles, are leaf-feeders.

Cicindelidæ, or **Tiger Beetles.** These are sand-loving insects, flying and running with great rapidity; but the actual distance covered at each flight is not great. They are entirely carnivorous, and alike in the larval and the perfect insect form render good service to man. They capture their prey alive, and feed upon the juicy parts only. The larvæ are remarkable by reason of the fact that they lurk in their sandy burrows, supporting themselves in an upright position by means of a pair of strong hooks found upon the fifth segment of the body. The jaws are extended ready to snap any insect which ventures within striking distance, and which is promptly hurried to the bottom of the tunnel. The perfect insects have a large head, with the clypeus, or face, extending laterally in front of the antennæ. The eyes are prominent. The blade of the first maxilla has at the tip a hook-like process. The legs are long, and the tarsi (feet) five-jointed. Fig. 163 represents the common, but beautiful, *Cicindela campestris*. The Tiger Beetles, so far as this country is concerned, are sunshine-lovers, and they are the most voracious of all our native *Coleoptera*, and most useful to gardeners.

Coccinellidæ, or **Ladybirds.** These Beetles are too well known outwardly to need any description, and they are amongst the gardener's best friends, being useful in both the larval and the perfect form. They subsist largely on Aphides and Scale insects. The tarsi, at a casual glance, appear three-jointed, but closer investigation will show that the third joint is made up of two. The larvæ are very active, and before pupating suspend themselves by the hinder extremity.

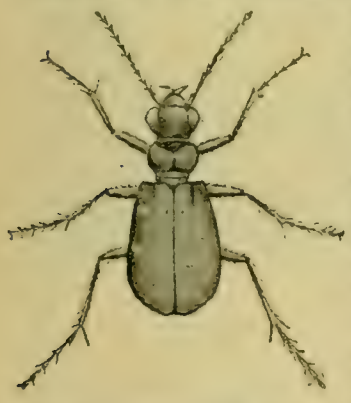


FIG. 163. COMMON TIGER BEETLE *(Cicindela campestris).* (Much magnified.)

Curculionidæ, or **Weevils,** are chiefly distinguished by a distinct but variable-sized beak (rostrum), the absence of a labrum, small, short palpi, and elbowed antennæ. Usually both Beetles and grubs are destructive, and all parts of plants, from flower-buds to roots, are laid under contribution. An interesting species, found sometimes in gardens where there are Birches, is the leaf-rolling *Rhynchites betulæ*. The genus *Otiorhynchus* is a peculiarly destructive one, the Black Vine Weevil, *O. sulcatus* (Fig. 164), being practically omnivorous. The larvæ are mostly legless, fleshy grubs, much wrinkled and curved.

Elateridæ, or **Click Beetles,** are of elongate form (see Fig. 34, page 29), with five-jointed feet, thread-like, saw-like or, less often, comb-like antennæ, and a pro-sternal process which, fitting into the meso-sternal cavity, enables the insects to spring into the air when placed upon their backs, at the same time making a "clicking" noise. The larvæ are narrow and elongate, with hard skins and short legs, and constitute the much-dreaded Wireworms of the gardener and agriculturist; they live as grubs from two to four years.

Beetles—*continued.*

Histeridæ are small shiny black or brown Beetles, ovate as to form, and with short, bent antennæ, ending in a very distinct and compact club. The elytra are straight behind, and leave two segments of the body exposed. The feet are five-jointed. The Beetles are predaceous in both the larval and the perfect state, and destroy numbers of noxious flies, &c. They are found largely in animal manures. The larvæ have neither ocelli nor labrum; the mandibles are powerful.

FIG. 164. BLACK VINE WEEVIL *(Otiorhynchus sulcatus).*

Lucanidæ, or **Stag Beetles.** In this family is to be found the largest of British Beetles, *Lucanus cervus*, whose formidable mandibles in the case of the male (Fig. 473, Vol. II.), frequently toothed, are very distinct. The antennæ end in a comb-like club, particularly pronounced in the male. It is doubtful whether these insects attack healthy trees. The larvæ live in oak and other trees for several years; they are white, fleshy, semi-circular grubs, with a horny head.

Malacodermidæ. This family contains several species of great use to the gardener, as the larvæ are predaceous carnivorous insects, feeding chiefly upon snails. The best known is the light-bearing Glowworm *(Lampyris noctiluca)*, whose wingless female and winged male have already been noted above. The feet are five-jointed. These Beetles are usually of elongate form (like the familiar Soldier Beetles, so numerous in gardens). The grubs of some, like those of the Glowworm, differ but little from the larviform females in the perfect insect stage.

Scarabæidæ, or **Chafers.** This is a very variable family. Some individuals, like the dung-buryers, are useful to gardeners; while others (Cockchafer, June Bug, and Rosechafer) are very destructive. The Beetles of this family have much in common with the *Lucanidæ*, though the plates terminating the antennæ are more compact. The grubs also are like those of the Stag Beetles, but smaller.

Scolytidæ resemble somewhat the members of the *Curculionidæ*, but the beak is very short and broad. The antennæ are short and compactly clubbed. The species are mostly wood feeders, and do damage to both fruit and park trees. They appear in vast numbers, and increase very rapidly. A tree attacked by these Beetles, if carefully examined, will be found tunnelled in all directions, the various batches of legless larvæ starting branch galleries from the vicinity of those made by the females when egg-laying.

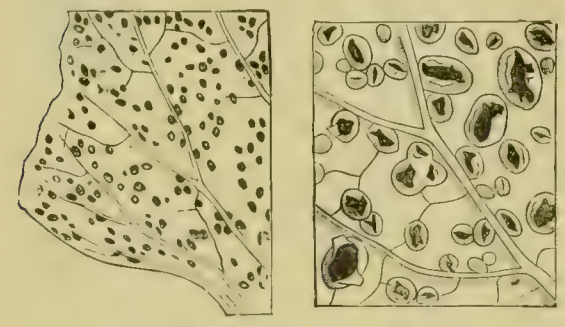
Silphidæ, or **Carrion Beetles,** include many well-known species, like the Burying Beetles (*Necrophorus*), which are useful, and at least one species which to gardeners is undesirable—the Beet Carrion Beetle (*Silpha opaca*), so destructive to Beet, &c. They vary in form and size, the familiar Burying Beetles being amongst the largest. The members of this family have usually (but not always) five-jointed feet and straight, clubbed antennæ. The larvæ are active and campodeiform; their food chiefly consists of decomposing animal and vegetable matter.

Staphylinidæ, or **Rove Beetles.** A well-marked and very numerous family, formerly comprehended under the name of *Brachelytra*, on account of the short elytra. They vary considerably in size. One of the most familiar is the Devil's Coach Horse Beetle (Fig. 225, Vol. I), or Cock-tail, a very intrepid insect, and one of the gardener's best friends. Contrary to the general opinion entertained,

Beetles—*continued.*

this Beetle can fly well. In form *Staphylinidæ* are elongate. Those commonly met with feed upon insects, molluscs, and worms. The feet are five-jointed. The larvæ are active, and in general remind one of those of the *Carabidæ*.

BEET RUST (*Uromyces betæ*). In England, America, and many parts of Europe, this fungus does an amount of damage to Garden Beets as well as to Mangel Wurzels in fields, by causing the growth to be stunted and the roots to be deformed and generally of poor quality. The Sea Beet (*Beta maritima*) is also liable to be attacked. The reddish-yellow Cluster Cup, or first stage of the fungus, is found in spring; this is



Natural size. Magnified (×10).

By permission of the Board of Agriculture.

FIG. 165. BEET RUST, Uredospore stage.

succeeded by the uredospore stage (Fig. 165), in which the spores are of a light brown, and edged with points when seen under a microscope; finally, these give place to the teleutospores, which carry the fungus on to the next season.

Preventive measures consist in spraying the plants at intervals as soon as the first stage is noticed, so as to render the foliage in such a condition that the uredospores, when they burst through the skin, will not germinate. Great care must also be taken to burn all trimmings at the time of lifting the roots in autumn, otherwise if the same quarters are used for Beet or Mangels the trouble will be intensified. Obviously, too, the eradication of any Wild Beet in the neighbourhood of the plantation is desirable.

BEFARIA. SYN. *Acunna.* This genus includes about twelve or fifteen species, natives of Mexico, Florida, Cuba, and South and Central America.

BEGONIA. Including *Eupetalum.* Of this vast genus about 350 species are known; they are mostly natives of tropical America and tropical and sub-tropical Asia and Africa, and are rarely found in the Pacific Islands.

Only a comparatively few years ago it was considered an impossibility to cross the Shrubby Begonia with the Tuberous-rooted species, but this has been successfully accomplished by Messrs. J. Veitch and Sons, Chelsea, who have produced from the union a strain which continue to blossom abundantly all through the winter months. They originated by crossing the Tuberous Begonia with the well-known winter *B. socotrana*; several distinct and handsome varieties are now in commerce, and will be extensively grown in the future. Perhaps the most useful and beautiful of all winter-flowering Begonias is the charming Gloire de Lorraine, raised by MM. Lemoine and Son, of Nancy, by crossing *B. Dregei* and *B. socotrana*; the foliage is a beautiful green, of the same shape as *B. socotrana*, but very much smaller; the stems are slender, terminating

Begonia—*continued.*

in a cymose inflorescence of lovely clear pink flowers. A beautiful white sport has been produced, resembling Gloire de Lorraine in all respects except in the colour of the flower. So far no hybridiser has been able to cross Gloire de Lorraine with any species or variety, nor have any fertile seeds been produced; therefore, the only means of propagating is by stem- or leaf-cuttings, both of which root readily if placed in a little bottom-heat in a temperature of 70deg. *Begonia incomparabilis* originated by crossing *B. polypetala* and *B. Frœbeli*, and produces bright scarlet flowers above the large foliage of the dwarf plant, commencing to blossom in summer, and continuing until late in the year. The above are the best of the new forms of the Begonia for winter-flowering, and are sure to become popular.

The freedom with which the Begonia is employed for bedding in the public parks and gardens of our large towns at once stamps it as a most useful and reliable plant for smoky districts. It appears to great advantage when compared with many other subjects, especially after heavy storms of rain, when Pelargoniums and kindred plants are miserable-looking objects, all the flowers being knocked to pieces, and anything but attractive. The Begonia, however, appears as fresh and beautiful as ever, and looks as if it had enjoyed the heavy rain. To produce the best effect the plants should have a start into growth in gentle heat, commencing about the middle of April, using a rich compost for the tubers, and afterwards keeping them close to the glass to induce a short-jointed, sturdy growth. By the middle of May the plants may be placed in a cold frame, not giving much ventilation for a few days; afterwards they should be gradually exposed to more air, removing the lights entirely on warm days and nights. By the first week in June they will be hardened sufficiently to plant out in beds that have been well enriched previously with good farmyard manure. Seedlings such as Fig. 166 are frequently employed in bedding with good effect.

Where many have failed with the Begonia is by planting out in poor soil, or under the shade of trees, both of which are disliked by the Begonia. If a mulch of well-rotted manure can be applied to the soil immediately after planting, not only is moisture conserved, but the roots are fed to such an extent that floriferous growth is made all through the season, until the plants are cut down by frost. Under the conditions advocated no plant will surpass the Begonia for bedding purposes, and few equal it for town or villa gardens, where the atmosphere is more or less charged with obnoxious matter. Another advantage is that the Begonia may be taken up and stored away in boxes in a fairly warm, dry place, and no further attention is necessary until started into growth again in the spring; whereas the Pelargoniums and other soft-wooded plants must be potted and given attention in watering, &c., all the winter, amounting to a considerable cost altogether.

Begonia Haageana is a lovely plant for an intermediate house, as it is free in growth and nearly always in blossom. The large flesh-coloured flowers are borne in great clusters. *B. semperflorens* is a particularly valuable mid-winter flowering plant, as its white flowers are borne freely. It is also useful for summer-bedding, as the foliage is heavily stained with crimson and deep purple-bronze in August, at which time it is one of the most conspicuous features in the flower-garden. The variety named *gigantea rosea* is of strong growth, and bears an abundance of rosy-red flowers. *B. fuchsioides* is a good pillar-plant, and bears drooping panicles of bright scarlet flowers freely.

To the species and varieties described on pp. 170-9, Vol. I., the following should be added.

B. acerifolia. S. This name has also been applied by Messrs. Veitch and Sons to a garden hybrid between *B. Burkei* and *B. decora.*

Begonia—*continued.*

B. albo-picta (white-painted). S. *l.* shortly stalked, small, elliptic-lanceolate, glossy-green, freely spotted with bright silvery-white. Brazil.

B. Ameliæ (Amelia's).* *fl.* bright rose-coloured, disposed in terminal, trichotomously-branched cymes. *l.* obliquely cordate-ovate, crenulate, shining green. 1885. Habit robust, compact, and branching. A greenhouse, garden hybrid between *B. Bruantii* and *B. Lynchiana.* (R. H. 1885, p. 512, f. 89-90.)

B. ascotiensis (Ascot). *fl.* bright dark red, disposed from six to twelve in a cyme; peduncle 3½in. to 4in. long. Summer. *l.* ovate, thick, shortly petiolate, smooth, very finely toothed. *h.* 2ft. to 3ft. Origin unknown.

B. Baumanni (Baumann's).* T. *fl.* carmine-rose, 3in. to 4in. in diameter, agreeably scented; peduncles purplish, erect, leafless, 1ft. to 1½ft. high, about five-flowered. *l.* few, reniform, dark green above, purplish beneath. Rootstock producing short, fleshy stems. 1890. An elegant, greenhouse species, with the habit of *B. socotrana.* (B. M. 7540.)

B. Beddomei (Beddome's).* T. *fl.* pale rose-coloured, cymose, the males 1½in. in diameter, the females smaller and darker; scape shorter than the petioles, brown-scaly. December. *l.* radical, erect; blade horizontal, 4in. to 6in. in diameter, membranous and pellucid, broadly and obliquely ovate-cordate or orbicular-cordate, obscurely lobed and denticulate, ciliolate, pale green with white spots above, dull red-purple beneath; petioles hairy, 4in. to 6in. long. Assam, 1883. (B. M. 6767.)

FIG. 166. SEEDLING TUBEROUS-ROOTED BEGONIA.

B. Bertini (Bertin's).* T. *fl.* reddish-scarlet, very large, less pendent, very numerous. Otherwise the plant resembles *B. Worthiana.* 1894. (R. H. 1894, p. 247, f. 93-94.)

B. bicolor (two-coloured). *fl.* bright rose, disposed in a terminal raceme; peduncles one- to three-flowered. *l.* broad, obliquely reniform, green, spotted with white, the upper ones having bulbils in their axils. Mexico, 1891. A tall, erect-growing, greenhouse species.

B. Bismarcki (Bismarck's). *fl.* light satiny-rose, 1½in. across; panicles large, drooping, many-flowered. November and December. *l.* large, lobed, very acuminate, oblique, 6in. long. 1888. Garden variety.

B. boliviensis sulphurea (sulphur-coloured). *fl.* sulphur-yellow, spreading, small but very pretty. *l.* long and velvety. 1895. A pretty variety for pot-culture.

B. Carrieri (Carrière's).* This is said to be a hybrid between *B. semperflorens* and *B. Schmidtiana.* The flowers are nearly as large as those of *B. semperflorens rosea*, and are produced much more plentifully. *l.* roundish-ovate, of a bright, cheerful green. Small plants appear to flower with great freedom. 1884.

B. castaneæfolia (Castanea-leaved). A synonym of *B. fruticosa.*

B. cinnabarina albo-vittata (white-striped). A garden variety having the petals striped with white. 1892. (I. H. xxxix. 165.)

B. Clementinæ (Princess Clementine's). *l.* large, deflexed, roundish-ovate, cordate at the base, the margin lobed; upper surface bronzy-green, irregularly banded greenish-white; under-surface rose-coloured, with ribs of a darker hue. 1883. A hybrid, said to be raised between *B. diadema* and *B. Rex.* (G. C. ser. iii., vol. iii., p. 265; I. H. xxxv., t. 39.)

B. compta (adorned). *l.* of a satiny green, a silvery tinge running along the course of the midrib, obliquely ovate, angular. Brazil, 1886. A pretty, greenhouse plant.

B. coronata (crowned). A garden hybrid of which *B. caroliniæfolia* is one of the parents.

B. Credneri (Credner's). A garden hybrid between *B. Scharffi* and *B. incarnata metallica.* 1890. (R. G. 1890, p. 562, f. 80.) SYN. *B. Scharffi metallica.*

B. cyclophylla (round-leaved). T. *fl.* rose-coloured and rose-scented, disposed in a trichotomous cyme, the males 1in. to 1½in. in diameter; scape 6in. high, slender, glabrous. April. *l.* solitary, 6in. broad, orbicular-cordate, with overlapping basal lobes, obtuse or sub-acute, palmately seven- to nine-nerved, obscurely denticulate; petiole shorter than the blade. South China, 1885. (B. M. 6926.)

B. Davisii superba (superb). A double-flowered variety. 1881.

B. decora (decorative). S. *l.* dark green, profusely dotted with silvery-grey, something in the way of those of *B. maculata*, but the spots more minute, obliquely lanceolate. Brazil, 1886. Stove.

B. diadema (diadem).* *l.* deeply digitate-lobed; lobes irregular, glossy, quite glabrous, light green, irregularly marked with white blotches; under-surface with a red zone near the stalk. A handsome foliage plant. Borneo, 1883. (I. H. xxix. 446.)

B. Duchartrei (Duchartre's).* *fl.* white, 2in. in diameter, the males with four petals, the females with five. Winter. *l.* 6in. to 12in. long, ovate-lanceolate, acute at apex, dark green, with a dark reddish-violet midrib; petioles 2in. long. *h.* 3ft. 1892. A vigorous hybrid between *B. echinosepala* and *B. Scharffi.* (Gn. 1892, vi., p. 115; R. H. 1892, p. 29, f. 7.)

B. egregia (notable).* *fl.* white, ½in. across, many in a gracefully drooping, corymbose cyme 3in. to 4in. in diameter; peduncle 2½in. to 3in. long. Winter. *l.* peltate, 8in. to 11in. long, 2½in. to 4in. broad, obliquely oblong, acuminate, obtusely rounded at the unequal base, hairy; petioles 2½in. to 3in. long. Stem woody below. *h.* 3ft. to 4ft. Brazil, 1887.

B. erecta cristata (crested). A very curious form, having the tips of the petals lamellate and crested, imparting a cruciform appearance to the inside of the flowers. (R. H. 1896, p. 61, f. 17.)

B. Faureana (Felix Faure's). *l.* ample, deeply cut into five to seven lobes, rather large, acute or sub-obtuse, of a tender green, zoned with white. Stem strong, arborescent, scaly. Tropics. SYN. *B. platanifolia*, of gardens (I. H. 1889, p. 152, t. 34).

B. F. metallica (metallic). A variety having metallic reflections on the leaves. 1895. (I. H. 1895, t. 43.)

B. fruticosa (shrubby). *fl.* pink, small, sub-umbellate; cymes often shorter than the leaves. February. *l.* ovate-oblong, 2in. to 3in. long, seven to nine lines broad, penninerved, shortly petiolate, obtuse or sub-acute at base, repandly serrate-toothed, glabrous, and, as well as the stipules and bracts, persistent. *h.* 3ft. Brazil, 1838. SYN. *B. castaneæfolia.*

B. f. alba (white). A large and robust variety, with white flowers.

B. fulgens (brilliant). T. *fl.* rich red, fragrant, disposed in numerous racemes. *l.* green, roundish-oblique. Bolivia, 1893. Closely related to *B. Davisii.*

B. glaucophylla (glaucous-leaved).* *fl.* pink, small; male sepals two, broadly ovate, obtuse, petals two, much smaller, incurved; female sepals four, broadly ovate, concave; panicle ample, many-flowered, nodding or pendulous. *l.* petiolate, oblong-lanceolate, acuminate, the margins undulated. Stem elongated, pendulous, the branches white-spotted. Brazil. A capital basket plant. (B. M. 7219.)

B. globosa (globose). A garden hybrid. 1888. (R. G. 1888, p. 645, f. 143.)

B. gracilis racemiflora (racemose-flowered). A useful, decorative variety, of bushy habit, having darker flowers than the type, and red stems. 1886.

B. Haageana (Haage's). A synonym of *B. Scharffi.*

B. Hemsleyana (W. B. Hemsley's).* T. *fl.* pale pink, darker towards the tips, few in a dichotomous cyme; males 1½in. across; females rather larger; capsule three-winged. April onwards. *l.* erect, orbicular, 3in. to 5in. across, palmati-partite or almost

Begonia—*continued.*

pedate; segments seven to nine, radiating, lanceolate, serrated. Stem 1ft. to 1½ft. high, sparingly branched, hairy. Yunnan, China, 1898. (B. M. 7685.)

B. heracleicotyle (hybrid). A hybrid between *B. heracleifolia* and *B. hydrocotylifolia.*

B. Hoegeana (Hoege's). *fl.* white, disposed in lax, axillary cymes, only half as large as those of *B. nitida* (which this plant somewhat resembles). *l.* broadly ovate, rounded at base, scarcely oblique. Mexico, 1886. A very glabrous, greenhouse climber.

B. hybrida coccinea (red). *fl.* bright scarlet, freely produced. Winter. A desirable hybrid, of dwarf, compact habit.

B. Jaurèzi (Jaurez'). A garden variety with semi-double flowers. 1890.

B. Johnstoni (Johnston's). *fl.* pale rose-coloured; males 1½in. to 2in. in diameter, with four broadly oblong sepals and numerous stamens; females smaller, with five sepals; cymes four- to six-flowered; peduncles long. April. *l.* 4in. to 6in. long, obliquely ovate, acute, coarsely crenate, deeply two-lobed at the base, hairy; petioles 4in. to 6in. long. Stem succulent, 1ft. to

Begonia—*continued.*

hairs at the base. *l.* large, obliquely cordate-ovate, dark, shining green, with purple reflections. 1884. A garden hybrid between *B. echinosepala* and *B. incarnata metallica*, of tall and vigorous habit. (R. H. 1884, p. 200, f. 43.)

B. marginata illustrata (margined, illustrated). *l.* slightly bullate, borne on tall, densely hairy stalks, the pea-green ground being reticulated with depressed veins of green and chocolate colour. 1897. A garden seedling.

B. Meysseliana (Meyssel's). *l.* pale green, ornamented with silvery spots. Sumatra, 1884. A stove or greenhouse, foliage plant, suitable for outdoor decoration in summer.

B. octopetala Lemoinei (Lemoine's). A garden hybrid, raised in 1889. (R. H. 1889, p. 32, f. 7.)

B. olbia (rich). *fl.* white, in small cymes, freely produced from the axils of the leaves. *l.* oblique, five-nerved, irregularly toothed, slightly bullate, the upper surface of a very dark bronzy-green, covered with small, reddish hairs, and studded with small, neat, round, white spots, the under-surface of a deep red; petioles erect. Stems short, fleshy. Brazil, 1883. (F. & P. 1884 603.)

FIG. 167. BEGONIA DUCHESS OF MARLBOROUGH.

1½ft. high, and, as well as the branches, petioles, peduncles, and pedicels, marked with scarlet striæ. Tropical Africa, 1884. (B. M. 6899.)

B. Lansbergeæ (Mme. van Lansberge's). *l.* 6½in. long, 3½in. broad, very thick, obliquely cordate-ovate, long-acuminate, deeply sinuated, entire, with rounded lobes, on long petioles. Brazil, 1893. Plant villous. (I. H. 1893, t. 174; R. H. 1893, p. 202.)

B. Lemahoutii (Le Maout's). *fl.* white, tinted with rose on the outside, produced in cymes; peduncles rising above the leaves. *l.* oblique, acuminate, dark green above, washed with purple beneath, wavy, toothed and ciliated on the margins. 1889. A compact, greenhouse species, of unknown origin.

B. Lesoudsii (Lesoud's). A garden hybrid,

B. Lubbersii (Lubbers').* *fl.* white, tinged green, large, in axillary, nodding cymes of about six. *l.* alternate, distichous, smooth, entire, peltately attached to fleshy petioles; stipules large, ovate, persistent, bright red. Stems cylindrical, green, deflexed at the tips. Brazil, 1884. A handsome, sub-shrubby species. (B. H. 1883, 13.)

B. manicata aureo-maculata (golden-spotted). *l.* round, mottled with white.

B. Margaritæ (Margaret's). *fl.* pale rosy, large, in corymbose cymes; sepals of the males orbicular, having a large tuft of rosy

B. patula (somewhat spreading). S. *fl.* pink, many in a cyme. *l.* obliquely-cordate, angled or doubly toothed on the margin, dark green and sparsely hairy above, reddish beneath. *h.* 3ft. Brazil, 1889.

B. pictaviense (Poictiers). A garden hybrid between *B. Scharffi* and *B. incarnata metallica.* 1891.

B. platanifolia. There are several varieties of this species, including *decora*, *illustris*, and *pulvinata*, of which the first-named is the most desirable owing to its predominating silvery marking. 1894.

B. platanifolia (of gardens). A synonym of *B. Faureana.*

B. rubella (reddish). *l.* numerous, obliquely ovate, lobed, toothed, ciliated, bronzy-green, the veins marked out with pale green, spotted all over with purplish-brown, the under-surface red. Stems stout, decumbent. India, 1883.

B. Scharffi (Scharff's).* *fl.* white, in large, long-stalked corymbs; males 2in. to 2½in. across, having two large, elliptic sepals echinate with red bristles outside, and two narrow, spathulate petals; females smaller, with obovate segments. *l.* 4in. to 10in. long, 2in. to 5in. broad, obliquely cordate-ovate, acuminate, purplish beneath. *h.* 1½ft. to 2ft. South Brazil, 1889. A handsome, free-flowering, stove species, hispid with red hairs. (B. M. 7023.) SYN. *B. Haageana* (of gardens).

B. S. metallica (metallic). A synonym of *B. Credneri.*

FIG. 168. BEGONIA DIAMOND JUBILEE.

B. semperflorens rosea (rosy). *fl.* bright rose-coloured, the petals white at base. 1883. A pretty, free-flowering, garden variety. (R. H. 1881, p. 330.) *rosco-multiflora* is a many-flowered form. 1892.

B. s. Sturzii (Sturz'). *fl.* rose-pink, disposed in cymose panicles. *l.* whitish-spotted. 1886. A fine, floriferous variety. (R. G. 1220.)

B. sinensis (Chinese). T. *fl.* bright rose-red, monœcious, in axillary and terminal cymes; males ¾in. across; females rather larger. October. *l.* 3in. to 5in. long, more or less unequal-sided, ovate-cordate, acuminate, obscurely lobulate, serrated and serrulated, pale and often rosy beneath, hairy. Stem 1½ft. to 2ft. high. China, 1838. Greenhouse. (B. M. 7673.)

B. socotrana. Seedling hybrid forms have been obtained by crossing the summer-flowering, tuberous, garden varieties with *B. socotrana.* The following are of great horticultural value, as the blossoms are freely produced during the winter months, and the richly-coloured sprays of flowers are valuable for placing in vases: ADONIS, flowers rosy-carmine, medium-sized, leaves large and handsome, habit robust and erect; AUTUMN ROSE, flowers rose-pink, pretty, intermediate between those of *B. incarnata* and *B. socotrana* (the pollen parent); JOHN HEAL, flowers clear rose, lasting for two or three weeks, leaves much smaller than those of ADONIS, habit graceful; MRS. HEAL, the finest variety yet raised, flowers rose-carmine, 3in. in diameter, leaves like those of JOHN HEAL, habit erect; WINTER GEM, flowers more crimson than carmine, freely produced, leaves rhomboid, more like *B. socotrana* than the other hybrids. The first three can be freely propagated by cuttings; but the last can only be increased by the small tubers at the base of the stem.

B. subpeltata (somewhat peltate). *fl.* pale rose, with four petals, disposed in cymes. *l.* large, obliquely cordate, acute, 4in. to 4½in. long, bright carmine when young, becoming bronzy. *h.* 12in. to 16in. Garden hybrid.

B. umbraculifera (umbrella-bearing). *fl.* white, chiefly male, but a few female and bisexual; males 1in. across, with two sepals and about twenty stamens; females ¼in. across, with five sepals; cymes large, dichotomously branched. March. *l.* alternate, fleshy, 4in. to 6in. across, the lower ones reniform, the upper ones peltate. Stems 4ft. high, simple. Brazil, 1893. Remarkable for bearing hermaphrodite flowers, *B. frigida* being the only other species that does so. (B. M. 7457.)

B. venosa (veined). *fl.* white, small, disposed in slender, axillary cymes on red peduncles. *l.* large, sub-peltate, fleshy, freely sprinkled on the upper surface with silvery-grey scales; stipules very large (2in. long), transparent, membranous, strongly veined. Brazil, 1899. (B. M. 7657.)

B. Viaudi (Viaud's). *fl.* white, with a pink centre, very numerous. 1897. A garden hybrid between *B. Duchartrei* and *B. pictaviense.* (R. H. 1897, p. 561, f. 167.)

B. Worthiana (Worth's). A pretty variety obtained from seeds of *B. boliviensis*, from which it differs in having more abundant and less pendent flowers, and larger but shorter leaves. 1870.

Varieties of Tuberous Begonias. These have increased in popularity during the last few years, and the colour-range has also been greatly improved. Subjoined are some varieties that may be recommended.

Single-flowered.—*Crimson and Scarlet Shaded:* EARL OF CRAVEN, bright scarlet, very large and full, free and vigorous; LADY TYLER, intense scarlet, very large, of fine form, and free; LORD PEEL, deep crimson, of fine form and substance; MARS, bright scarlet, free and vigorous; MRS. H. G. MURRAY, rich scarlet, large, floriferous, and one of the best; SIR SYDNEY, deep crimson, very dwarf, and excellent in all points; SIR TREVOR LAWRENCE, beautiful crimson-scarlet, large, dwarf bushy habit.

Rose-coloured CHATTERTON, dark rose, free and strong, one of the largest; COLOSSUS, deep orange, shaded rose, very large, one of the finest; J. RICHMOND, magenta-rose, fine form, dwarf sturdy habit; MRS. NEWMAN, soft rose, very large, and fine for exhibition; ODORATA ROSEA PLENA, bright rose, remarkably free and sweet-scented.

White-flowered: BEAUTY, pure white of fine form, great size, and very free;

FIG. 169. BEGONIA MRS. PEREIRA.

Begonia—*continued.*

LAING'S FRINGED WHITE, a robust, floriferous variety, with the margin of the flowers beautifully fringed; MISS MALCOLMSON, very large, fine bushy habit; NELLY PRITCHARD, pure white, fine circular flower, of good habit, and wonderfully free; SAMUEL POPE, white, slightly shaded with rose, large and excellent; SUNLIGHT, white, margined with faint pink, very large and of good form; WHITE CAMELLIA, white, with greenish centre, of good, sturdy habit.

Yellow- and Orange-flowered: COUNTESS BROWNLOW, rich yellow, very large, dwarf, and floriferous; GOLDEN HIND, yellow, large and excellent; SIR WILFRID LAWSON, deep yellow, of fine form and sturdy habit.

Double-flowered.—*Crimson and Scarlet Shaded:* B. R. DAVIS, rich crimson, very large, compact, and floriferous; DR. NANSEN, intense crimson, free, and of fine form; H. J. INFIELD, scarlet, shaded with salmon, very free, and of good form; LORD CHELSEA, crimson-scarlet, one of the best; LORD DUNRAVEN, crimson-scarlet, large, floriferous, and of good habit; REV. G. T. LITTLE, fiery-crimson, of medium size, excellent.

Rose-coloured: DUCHESS OF MARLBOROUGH (see Fig. 167), light salmon-pink, fine form and erect habit; LUCERNE, salmon-rose, of fine substance; LADY MARY WOOD, salmon-rose, very large, one of the best; MISS THOMPSON, rosy-pink, dwarf and free; NURSE MARY CORNELL, rosy-salmon, very double, compact and free; ROSETTE, carmine-rose, of good size and substance, compact and free.

White-flowered: BLANCHE DUVAL, white, tinted blush, large and free; DIAMOND JUBILEE (see Fig. 168), creamy-white, dwarf bushy habit, very fine; LADY THEODORE GUEST, white, one of the finest, with bold erect habit; MISS EMILY CHILD, white, tinged with pink, very large, of good form and remarkably floriferous; MISS GRIFFITHS (see Fig. 170), a lovely shade, its double flowers having crimped petals, of excellent habit; MRS. PEREIRA (see Fig. 169), white, good form, large, and free.

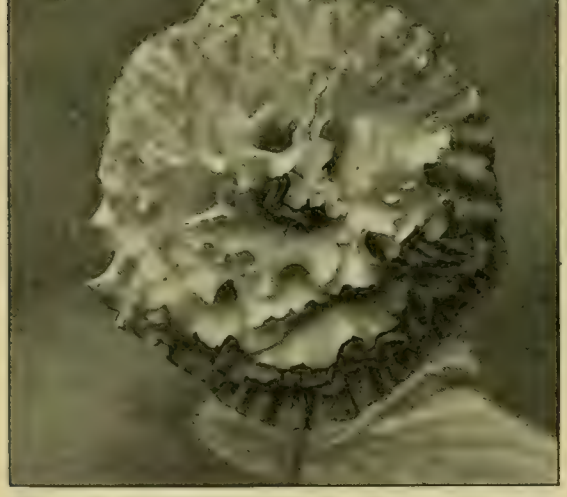


FIG. 170. BEGONIA MISS GRIFFITHS.

Yellow-flowered: MARCHIONESS OF SALISBURY, canary-yellow, large, free, and of bushy habit; MRS. R. CHRISTIAN, soft yellow, large and very double, sturdy, and floriferous; QUEEN OF THE BEGONIAS, orange-yellow, of large size, great substance, and splendid habit.

BEHNIA (a commemorative name). SYNS. *Dictyopsis, Hylonome.* ORD. *Liliaceæ.* A monotypic genus. The species is a greenhouse climber, with the habit of **Myrsiphyllum** (which *see* for culture.)

B. reticulata (net-veined). *fl.* greenish, ¾in. long, in simple or slightly compound cymes from the axils of the upper leaves. *l.* alternate, sessile, ovate, acute, rounded at base, 2in. to 3in. long, firm, green, glossy, with a distinct midrib, and five to seven strongly-marked vertical veins on each side, connected by close cross-veinlets (these have a beautiful effect when the leaves are dried). Stems glabrous, woody, terete, unarmed, copiously branched. South Africa, 1867. (B. M. 5638, under name of *Dictyopsis Thunbergii.*)

BELAMCANDA CHINENSIS. The correct name of the plant described on p. 23, Vol. III., as **Pardanthus chinensis** (which *see*).

BELANTHERIA. A synonym of **Brillantaisia** (which *see*).

BELENIA. A synonym of **Physochlaina** (which *see*).

BELIS. A synonym of **Cunninghamia** (which *see*).

BELLARDIA (of Colla). A synonym of **Microseris** (which *see*).

BELLARDIA (of Schreber). A synonym of **Manettia** (which *see*).

BELLEISLE CRESS. Another name for American orLand Cress *(Barbarea præcox). See* **Cress (American).**

BELLENDENA (named in honour of J. Bellenden Ker, an English botanist). ORD. *Proteaceæ.* A monotypic genus. The species, *B. montana*, is a greenhouse shrub with small, densely racemose flowers and scattered leaves, native of Tasmania. It has been introduced, but is of no particular value from a garden standpoint.

BELLEVALIA. To the species described on p. 179, Vol. I., the following should be added:

B. Heldreichi (Heldreich's). *fl.* of exactly the same colour as those of *Scilla sibirica*; spikes long, produced in pairs from each bulb. *l.* broad. Asia Minor, 1897.

B. romana is a synonym of *Hyacinthus romanus.*

BELLFLOWER, GLAND. *See* **Adenophora.**

BELLIDASTRUM or **BELLIDIASTRUM.** Included under **Aster.** *See* **A. Bellidiastrum.**

BELLINIA. A synonym of **Saracha** (which *see*).

BELLIS. This genus includes seven or eight species of annual or perennial herbs, natives of the Northern hemisphere. Flower-heads heterogamous, solitary, on leafless, often scape-like peduncles; involucre hemispherical or broadly campanulate, the bracts sub-biseriate; receptacle naked; achenes papulose or sparsely hispidulous. Leaves radical or alternate, entire or sinuate-toothed. To the species described on pp. 179-80, Vol. I., the following should be added:

B. integrifolia (entire-leaved). *fl.-heads* about as large as those of the common Daisy; ray florets pale purple or white; involucral bracts acuminate. March to June. *l.* entire, sparsely hairy and ciliated; radical and lower ones spathulate-obovate; upper ones lanceolate or oblong, sessile. Stems 4in. to 12in. high. North America, 1801. (B. M. 3455.)

BELLWORT. *See* **Utricularia.**

BELONITES. A synonym of **Pachypodium** (which *see*).

BELVALA. A synonym of **Struthiola** (which *see*).

BELVISIA. A synonym of **Napoleona** (which *see*).

BELVISIACEÆ. Included under **Myrtaceæ** (which *see*).

BENCOMIA (named in honour of Bencomi, the last King of Teneriffe). ORD. *Rosaceæ.* A small genus (two species) of sparsely branched, greenhouse shrubs, natives of Madeira and the Canary Islands. Flowers dicœcious, in long, axillary, pedunculate spikes; petals wanting. Leaves alternate, impari-pinnate; petioles elongated, sheathing at base; leaflets membranous, petiolulate, oblong, toothed. The species, *B. caudata* and *B. spinosa*, will be found described under **Poterium** (from which this genus has been separated by Bentham and Hooker).

BENGAL ROOT. *See* **Zingiber Cassumunar.**

BENINCASA (named in honour of Count Benincasa, an Italian). ORD. *Cucurbitaceæ.* A monotypic genus. The species is a large, stove, creeping, softly hairy annual, indigenous in tropical Asia, and cultivated for its edible fruits in tropical Africa and America. It is of no great

Benincasa—*continued.*

horticultural value, but is sometimes grown as a curiosity. For culture, *see* **Gourds.**

B. cerifera (wax-bearing). *fl.* yellow, large, monœcious, all axillary, solitary, the males on long peduncles, the females shortly stalked; stamens three, free. *fr.* 1ft. to 1½ft. long, cylindric, with a waxy bloom on the outside. *l.* roundish-reniform, 4in. to 6in. across, deeply cordate at base, palmately five-lobed; petioles 3in. to 4in. long. Tendrils bifid or tritid. Branches rather thick.

BENNETIA. A synonym of **Saussurea** (which *see*).

BENTINCKIA (a commemorative name). SYN. *Keppleria* (of Martius). ORD. *Palmæ.* A small genus (two species, according to the "Flora of British India") of stove, unarmed Palms, natives of Travancore and the Nicobar Islands. Flowers minute, monœcious or polygamous; spadix interfoliolar, branched; spathes many, the two lower ones short and incomplete, the upper ones bifid. Leaves terminal, equally pinnatisect. For culture, *see* **Areca.**

B. ceramica (ceramic). A synonym of *Rhopaloblaste hexandra.*

B. Coddapanna (native name). *fl.*, males scarlet; females lilac or violet; spadix 1ft. to 2ft. long. *l.* 3ft. to 4ft. long; leaflets 2ft. or more in length, 1in. broad, close together, linear, two-keeled, the tip usually bifid. Stem 1in. or more in diameter, 10ft. to 20ft. high, annulate. Travancore.

B. nicobarica (Nicobar Islands). *fl.*, spadix 1½ft. to 2ft. long, decompound, glabrous, the branches and branchlets inserted in woody grooves of the rachis. *l.* 5ft. to 8ft. long; leaflets 6in. to 2ft. long, sessile, linear, coriaceous, obscurely bilobed at apex; petioles short. Trunk annulate, 9in. in diameter, 60ft. to 70ft. high. Nicobar Islands. (R. H. 1896, p. 248, f. 93.) SYN. *Orania nicobarica* (J. B. xiii., 1875, p. 331, f. 19-25).

B. Renda (Renda). A synonym of *Cyrtostachys Renda.*

BENZOIN. Included under **Lindera** (which *see*).

BERARDIA. *Arctio, Arctium,* and *Villaria* are synonymous with this genus.

BERBERIS. Nearly 100 species have been described as such, but not more than fifty are botanically distinct; about fifteen are Asiatic, one is found in Europe and North America, and the rest inhabit the mountainous parts of America, from Oregon to Tierra del Fuego. To the species described on pp. 181-2, Vol. I., the following should be added:

B. angulosa (angular). *fl.* yellow, rather large, the broad outer sepals equalling the inner ones; peduncle exceeding the leaves, stout, curved. *fr.* red, globose- or broadly-oblong, ¼in. to ⅓in. long. *l.* 1in. to 1½in. long, obovate or obovate-lanceolate, puberulous, fascicled, usually entire. Branches erect, leafy. *h.* 4ft. Himalayas, 1844. (B. M. 7071.)

B. Aquifolium Moseriana (Moser's). A variety having light green leaves, tinged with coppery-red. 1895.

B. A. repens (creeping). The correct name of *B. repens.* It is well adapted for covering rockwork or for edging.

B. aristata integrifolia (entire-leaved). A variety having no spines on the edges of the leaves. 1888.

B. aurahuacensis (Aurahuaca). A synonym of *B. Lycium.*

B. Bealei (Beale's). *fl.* yellow, delightfully fragrant, disposed in clustered racemes and sometimes produced as early as the end of January. *l.* yellowish-green, furnished with long, spiny teeth. Japan, 1837. A handsome, erect shrub. (G. C. ser. iii., vol. i., p. 603.) SYNS. *B. nepalensis Bealei, Mahonia Bealii.*

B. Belstaniana (Belstan's). A garden synonym of *B. virescens.*

B. concinna (neat). *fl.* bright orange; outer sepals half as long as the inner ones; peduncles slender, exceeding the leaves. *fr.* large, oblong, pendulous. *l.* obovate, ⅓in. to ⅔in. long, spinous-toothed, deep green above, white beneath. *h.* 1ft. to 3ft. Sikkim Himalaya. A much-branched shrub, often forming appressed cushions. (B. M. 4744.)

B. congestiflora hakeoides (crowded-flowered, Hakea-like). *fl.* golden-yellow, in dense, globose, simple or compound heads ⅓in. to ⅔in. in diameter, which are sessile or pedunculate. Early spring. *l.* 1in. to 2in. long, almost imbricating, sessile or shortly petiolate, orbicular or very broadly oblong, thickly coriaceous, rigidly spinous-toothed, rounded or cordate at base. *h.* 6ft. to 7ft. Chili, 1861. A stout bush. (B. M. 6770.)

B. diaphana (diaphanous). *l.* of a clear green; branches clothed with spines about ⅔in. long. China, 1895. A vigorous tree.

B. elegans (elegant). A synonym of *B. Lycium.*

Berberis—*continued.*

B. Fendleri (Fendler's). *fl.* yellow, with some red bracts at the base of the calyx, disposed in racemes 1in. to 2in. long. Stem and branches purplish, shining. Rocky Mountains, 1888. This species is something in the way of our common Barberry (*B. vulgaris*). (G. & F. 1888, i., p. 462, f. 72.)

B. Fremonti (Fremont's).* *fl.* yellow, sweetly scented; racemes ascending, loosely few-flowered. May and June. *fr.* scarlet, large, dry and inflated when ripe. *l.* pinnate; leaflets in two or three pairs, oblong-lanceolate, with two or three large, spine-tipped teeth on each side. *h* 3ft. to 7ft. Texas, Arizona, 1888. A splendid and quite hardy, evergreen shrub, preferring a sunny, rocky, well-drained situation. (G. & F. 1888, i., p. 496, f. 77.)

B. gracilis (slender). *fl.* deep yellow, borne on bright red pedicels, and disposed in racemes about 3in. long. *l.* shining green, borne on bright red petioles. Branches slender. *h.* 6ft. Mexico. A very pretty, half-hardy species.

B. Hookeri (Hooker's). A synonym of *B. Wallichiana.*

B. Jamesoni (Jameson's). A synonym of *B. Wallichiana.*

B. Lycium (Lycium).* *fl.* yellow; racemes simple or compound, elongated, often corymbose, drooping, longer than the leaves. June. *fr.* violet, ovoid. *l.* almost sessile, sub-persistent, lanceolate or narrow-obovate-oblong, 1¼in. to 2½in. long, coriaceous, mucronate, very spinulose, usually quite entire. *h.* 6ft. to 8ft. Western Himalayas. An erect, rigid shrub. (B. M. 7075.) SYNS. *B. aurahuacensis, B. elegans.*

B. Moseriana (Moser's). A variety of *B. Aquifolium.*

B. nepalensis Bealei (Beale's). A synonym of *B. Bealei.*

B. pruinosa (mealy). *fl.* sulphur-yellow. *fr.* pure white. *l.* having their under-side, as well as the new growths, pure white. Yunnan, 1896. A dwarf shrub.

B. rotundifolia (round-leaved). *fl.* of a brilliant yellow, disposed in corymbs. *l.* entire, veined, rounded, glaucous beneath. Chili. A creeping, strongly spiny shrub.

B. Sieboldii (Siebold's). This species chiefly differs from our common Barberry in its rather paler-coloured and larger flowers, and in the leaves having ciliated margins. Japan, 1880. (G. & F. iii., p. 249, f. 38.)

B. Thunbergii (Thunberg's).* *fl.* numerous, small, ⅓in. to ⅓in. across, drooping; sepals red, half as long as the petals, which are pale straw-coloured suffused with red. April. *l.* in crowded tufts all along the branches, ⅓in. to nearly 1in. long, obovate or spathulate, entire. Spines straight, ⅓in. long. Japan, 1883. A low bush. (B. M. 6646.)

B. virescens (greenish). *fl.* sulphur- or greenish-yellow, ⅓in. in diameter, in fascicles or very short racemes. May and June. *fr.* scarlet or black, narrow-oblong, ⅓in. long. *l.* ⅓in. to 1⅓in. long, tufted, obovate, rounded or apiculate at apex, entire, or the larger ones spinulose-toothed. Branches spreading, divaricating. Sikkim Himalaya, 1850. (B. M. 7116.) SYN. *B. Belstaniana* (of gardens).

B. vulgaris ætnensis (Etna). A dwarf bush with peculiar zigzag branches and stout spines, and producing its flowers freely.

B. v. asperma (seedless). An old but uncommon variety, forming a stout bush, and in autumn bearing a heavy crop of bright scarlet berries.

B. v. foliis-purpureis (purple-leaved). One of the best of dark-leaved shrubs. It should be propagated by cuttings, layers, or division.

Other good varieties are: *amurensis, fructu-albo,* and *macrocarpa.*

BERCHEMIA. SYN. *Œnoplea.* About ten species, natives of Northern India, Java, China, Eastern tropical Africa, and North America, are included in this genus. The following should be added to that described on p. 182, Vol. I.

B. racemosa (racemose). *fl.* small, disposed in terminal panicles, and succeeded by dark brown berries. *l.* oblong or oblong-ovate, sub-acute. Japan and China, 1883. A hardy, climbing shrub.

BERGAMOTTE ORANGE. *See* **Citrus Aurantium Bergamia.**

BERGIA (named in honour of P. J. Bergius, M.D.). SYNS. *Lancretia, Merimea.* ORD. *Elatineæ.* A genus embracing about fourteen species of greenhouse or hardy, prostrate or branched herbs or under-shrubs, allied to *Elatine. B. verticillata* (SYN. *B. aquatica*) has been introduced, but is probably not now in cultivation.

BERIESA. A synonym of **Anredera** (which *see*).

BERKHEYA. SYNS. *Agriphyllum, Basteria, Crocodiloides, Gorteria* (of La Marck), *Rohria, Zarabellia* (of Necker). Including *Stobæa.* About seventy species are included in the genus, all being South African except one, which is found in the tropical region of that continent. To

Berkheya—*continued.*

those described on p. 183, Vol. I., the following should be added:

B. Adlami (Adlam's). *fl.-heads* yellow, 3½in. across, subcorymbose. *l.*, radical ones 1½ft. long, 7in. broad, sinuately lobed and spiny-toothed; upper ones 3in. to 6in. long, spotted with brown beneath. Stem herbaceous, 6ft. high, branched. Transvaal, 1897. This is by far the largest species known. (B. M. 7514.)

BERLANDIERA (named in honour of J. L. Berlandier, a Genoese botanist, who explored parts of Texas and Mexico; he died in 1851). ORD. *Compositæ*. A genus embracing four species of greenhouse or half-hardy, perennial herbs or under-shrubs, natives of the Mexico-Texan region. Flower-heads yellow, heterogamous, radiate, mediocre or rather large, pedunculate; rays in one series; involucre broadly hemispherical; receptacle nearly flat. Leaves alternate, crenate or lyrate-pinnatifid. *B. tomentosa*, the only species in cultivation, requires cool greenhouse treatment, and may be propagated by seeds or by cuttings.

B. tomentosa (downy). *fl.-heads* 1½in. to 2in. across, few in a terminal corymb; ray florets about eight, dull yellow, broadly ovate-oblong; disk green and reddish-brown. May and June. *l.*, lower ones oblong or ovate-oblong, narrowed to a petiole 3in. long; upper ones small, sessile. *h.* 1ft. to 2ft. Southern United States, 1898. A slender perennial, more or less hoary or cottony or glabrate. (B. M. 7680.)

BERREBERA. A synonym of **Milletia** (which *see*).

BERRY-BEARING ALDER. *See* **Rhamnus Frangula.**

BERTEROA. Included under **Alyssum** (which *see*).

BERTOLONIA. Six species, all natives of tropical America, are included in this genus. These stove plants are always admired for their elegant foliage. They are increased by cuttings taken in spring. Of late years some handsome hybrids have been raised, chiefly upon the Continent, and these have, to a certain extent, superseded the species. Some of the best are Comte de Kerchive, Madame Van Geert, Madame Pynaert, Souvenir de Gand, and Van Houttei. To those described on p. 184, Vol. I., the following should be added. *See also* **Gravesia** and **Monolena.**

B. argyræa (silvery). *l.* large, oval, pale green, handsomely veined, reticulated, and spotted with silvery-white, and having numerous white hairs on both surfaces and at the margins. 1894.

B. marmorata. *Eriocnema marmoratum* (L. & P. F. G. i. 27) is identical with this species. *B. Sanderæ* (Sander's) is a seedling form of it, much superior to the type. 1894. SYN. *Eriocnema Sanderæ* (G. M. 1894, p. 658).

BERTOLONIA (of Spinola). A synonym of **Myoporum** (which *see*).

BERTONERILA (a compound of the names *Bertolonia* and *Sonerila*). ORD. *Melastomaceæ*. Under this name several varieties of a hybrid between the genera *Bertolonia* and *Sonerila* are described and figured in the Catalogue of L'Horticole Internationale, Brussels, for 1896.

BESCHORNERIA. According to J. G. Baker, this genus embraces about half-a-dozen closely-allied species, restricted to Mexico. Flowers greenish or reddish, clustered, arranged in simple or panicled racemes. Basal leaves rosulate, ascending, lanceolate, glaucous, scabrous on the margins; stem-leaves bract-like.

B. Toneliana (Tonel's). The correct name of the plant described on p. 184, Vol. I., as *B. Tonelii*.

BESLERIA. About fifty species have been described, natives of tropical America, from Brazil and Peru to the West Indies and Mexico. To those given on pp. 184-5, Vol. I., the following should be added. Several species formerly included here are now referred to **Alloplectus, Brunfelsia, Episcia,** and **Tussacia** (which *see*).

Besleria—*continued.*

B. leucostoma (white-mouthed). *fl.* clustered in the axils; corolla ¾in. long, the tube tawny-orange, laterally compressed beneath near the white limb. April. *l.* oblong or almost ovate-lanceolate, acuminate, crenate-serrated, penninerved. *h.* 1ft. Colombia. SYN. *Hypocyrta leucostoma* (B. M. 4310; F. d. S. 257).

BESOM WEED. *See* **Thlaspis.**

BESSERA. *Pharium fistulosum* (B. R. 1546) is synonymous with *B. elegans*.

BETULA. This genus comprises about twenty-five species, broadly dispersed over Europe, Central and North Asia, and North America. Leaves alternate, toothed or serrated, rarely incised, penniveined. To the species and varieties described on p. 186, Vol. I., the following should be added:

B. acuminata (taper-pointed), of Ehrhart. A synonym of *B. populifolia*.

B. acuminata (taper-pointed), of Wallich. A synonym of *B. alnoides*.

B. alba fastigiata (pyramidal). A variety of free, distinct growth, in habit resembling the Lombardy Poplar.

B. a. japonica (Japanese). A variety with greenish-bronze stems. Japan, 1894.

B. alnoides (Alnus-like). *fl.*, male and female spikes slender, panicled, 3in. to 5in. long, pendulous. *l.* ovate or ovate-oblong, 3in. to 6in. long, cuneate, rounded, or cordate at base, unequally doubly or trebly serrated, pubescent beneath when young. Temperate Himalayas. SYN. *B. acuminata* (of Wallich).

B. alpina (alpine). A synonym of *Alnus viridis*.

B. grandis (large). A synonym of *B. alba*.

B. humilis (dwarf). A synonym of *B. fruticosa*.

B. lanulosa (slightly-woolly). A synonym of *B. nigra*.

B. Maximowiczii (Maximowicz's). *l.* widely oval, cordate at base, toothed, thin and almost membranous, bright dark green above, yellowish-green below, larger than those of any other Birch, being as much as 5½in. long. Bark bronzy-orange, smooth, peeling off in narrow scales and turning ashen-grey. *h.* 30ft. Japan, 1894.

B. Medwediewi (Medwediew's). *fl.*, catkins cylindrical, the males about 1½in. long, the females shorter. *l.* elliptic-ovate, acutely toothed, glabrous, the midrib beneath and the petiole pubescent. Branches glabrous. Trans-Caucasus, 1887. (R. G. 1887, p 384, f. 1-4.)

B. occidentalis (Western). *fl.*, female catkins broadly cylindrical; males 1½in. long. *l.* 2in. to 2½in. long, broadly ovate-rhomboid, acute, of a harsh and dry but not thick texture, slightly lobed and with coarse and sharp serratures, paler beneath but never dotted. Main branches erect, somewhat twiggy, clothed with reddish-brown bark. *h.* 6ft. to 10ft. Western North America.

B. papyracea occidentalis (Western). This variety differs from the type in having deciduous bark and larger and thicker leaves, which are shining above; it comes true from seed. North-west America, 1888.

B. pubescens (downy). A form of *P. alba*.

B. pumila Grayi (Gray's). *l.* roundish, shining green. British Columbia, 1890.

B. pumila-lenta (hybrid). According to the authority quoted below, hybrids between the two species indicated by this name have originated in the Arnold Arboretum. 1895. (G. & F. 1895, p. 243, f. 36; I. H. 1895, p. 243, f. 36.)

B. Raddeana (Radde's). *fl.*, catkins ovoid-oblong, ¾in. to 1in. long. *l.* small, ovate, acutely toothed, pubescent beneath on the nerves and in the angles of the nerves. Young shoots softly pubescent. Caucasus, 1887. (R. G. 1887, p. 384, f. 5-11.)

BEURRERIA. A synonym of **Bourreria** (which *see*).

BHOTAN PINE. *See* **Pinus excelsa.**

BIARUM. Bentham and Hooker included *Ischarum* (*see* p. 201, Vol. II.) under this genus, which thus embraces about a dozen species, found in the Mediterranean region, especially in the Orient. To those described on p. 187, Vol. I., the following should be added:

B. Bovei (Bove's). *fl.*, spathe tube green, the blade greenish outside, deep purple within, lanceolate, three or four times longer than the tube. *l.* varying from ovate to elliptic-oblong, abruptly contracted or narrowed to a long petiole. Anatolia, &c.

B. B. Blumei (Blume's). *l.* ovate-oblong. Asia Minor, 1860. SYNS. *Ischarum crispulum, I. Kotschyi*.

B. carduchorum. *fl.*, spathe sub-sessile, 5in. to 6in. long, green, spotted with purple on the outside, blackish-purple within; spadix blackish, slender, nearly as long as the spathe. *l.* short, spathulate-lanceolate, forming a small cluster from

Biarum—*continued.*

the centre of which the spathe rises. Syria, 1891. SYN. *Arum syriacum* (R. G. 1891, p. 657, f. 124).

B. eximium (choice). *fl.*, spathe tube green, ¾in. long, the limb purplish and minutely spotted outside, dark purple within, 3½in. long, at length revolute; spadix appendage 2½in. to 3in. long; peduncle very short. *l.* ovate-oblong or elliptic-oblong, 1½in. to 3½in. long, narrowed to the petiole. Asia Minor, 1854. SYN. *Ischarum eximium.*

B. Spruneri (Spruner's). *fl.*, spathe purple and greenish, the tube 1½in. long, the limb lanceolate, 3in. to 4in. long; peduncle 1½in. to 2in. long. *l.* spathulate-lanceolate, long-narrowed into the petiole. Greece, &c., 1894. Plant having the habit of *B. tenuifolium.*

BIBIO MARCI. *See* **St. Mark's Fly.**

BICORONA. A synonym of **Melodinus** (which *see*).

BICUSPIDATE. Having two cusps or points. *See* **Cuspidate.**

BIDENS. SYN. *Pluridens.* Nearly 100 species have been described, but probably not more than fifty are entitled to rank as such; they are broadly dispersed over the temperate and warm regions of the globe. To those described on p. 187, Vol. I., the following should be added. It is a perennial, but in this country is best treated as a half-hardy annual.

B. atrosanguinea. The correct name is now *Dahlia Zimapani.*

B. humilis (dwarf). *fl.-heads* yellow, long-pedunculate, solitary; ray florets ¼in. long. Summer. *l.* irregularly bipinnately five-parted; lobes linear-lanceolate; petioles ciliated. Stems almost procumbent. Cotopaxi, 1861.

BIEBERSTEINIA. ORD. *Geraniaceæ.* According to Bentham and Hooker, this genus embraces three species, natives of Central or Western Asia. Flowers yellow or whitish, in rather long, pedunculate racemes, regular; sepals five, imbricated; petals five, hypogynous, imbricated; stamens ten. Leaves stipulate, pinnate or pinnately dissected.

BIENNIALS. From June till August is the usual time to sow Biennials—the earlier the better, as they then stand a chance of making nice plants before winter sets in. For sowing, a border should be chosen with an aspect other than a southern one, so that the seedlings do not receive the full rays of the scorching summer sun; the soil should be moderately rich, deeply dug, and free from weeds. The seeds are best sown in drills, as the hoe can then be used for keeping down weeds, and also for keeping the surface open—a point which is often greatly overlooked in the cultivation of plants of all kinds. After sowing, a good watering should be given through a fine rose, so as not to disturb the seeds, and a thin shading of tiffany or other light material should be thrown over, to keep the soil from drying up too quickly; great care, however, must be taken to remove this as soon as the seedlings break through the soil. When large enough, they should be transplanted into rows a few inches apart; this must be done before they get overcrowded in the seed-bed, and they will then make strong sturdy plants, and will lift with good balls of soil when removed to their permanent quarters.

The time for permanent planting varies from the end of September to March, some preferring to plant in the autumn, because then the weather is usually much milder than in early spring, and if carefully planted they get a good hold of the new soil before winter sets in. On the other hand, those who wait until spring before planting have this advantage, viz., that the plants are all kept together, and if a spell of exceptionally hard weather is experienced they may be much more easily protected by having some dry leaves or other light material thrown lightly amongst them, than if scattered about the beds and borders.

With regard to the after-treatment, uses, &c., of these plants, the remarks under **Annuals** may be taken as applying equally to Biennials. A large number of hardy

Biennials *continued*

annuals are very often treated as Biennials by being sown in the autumn of one year for flowering the following spring.

The following list of Biennials may be of service: *Anchusa capensis* (Cape Forget-me-Not), half-hardy, invaluable for summer-bedding; *Beta Cicla variegata* (Chilian Beet); Dell's Crimson-leaved Beet; *Campanula medium* (Canterbury Bell), the single forms of which are popularly known as Cup-and-Saucer Canterbury Bells, whilst the double ones are known as the Hose-within-Hose Campanulas; *Celsia cretica, Chamæpeuce diacantha* and *C. Casabonæ, Dianthus barbatus* (Sweet William), *Glaucium luteum, Hedysarum coronarium, Humea elegans, Lavatera arborea variegata, Lunaria annua* (*L. biennis*), *Meconopsis nepalensis* and *M. Wallichii, Papaver nudicaule,* Stocks (Bromptons and Queens), *Verbascum olympicum* and *V. phlomoides,* and Wallflowers (*Cheiranthus*).

BIFOLIUM. A synonym of **Maianthemum** (which *see*).

BIFRENARIA. About ten species, natives of Brazil, Guiana, and Colombia, compose this genus. These plants do well when grown in the cool intermediate house under similar conditions to those recommended for Lycastes. To those described on p. 187, Vol. I., the following should be added:

B. atropurpurea (dark purple). *fl.* 2in. across when spread out, fragrant; sepals and petals dull claret-red, stained yellowish in the centre; lip bright rose, suffused with white, incurved at the sides, reflexed at the apex; scapes three- to five-flowered. *l.* oblong-lanceolate, 6in. to 10in. long. Pseudo-bulbs 2in. to 3in. long. Rio de Janeiro, 1823. SYN. *Maxillaria atropurpurea* (L. B. C. 1877).

B. aurantiaca (orange), of gardens. A synonym of *B. inodora.*

B. bella (beautiful). A synonym of *Cœlia bella.*

B. Charlesworthii (Charlesworth's). *fl.* yellow, with a few reddish-brown spots on the lip, about ¾in. long; scape 6in. long, bearing about six flowers. *l.* 9in. long. Pseudo-bulbs quadrangular, 1½in. long. Brazil, 1894. Allied to *B. racemosa.*

B. Hadwenii. The correct name is *Scuticaria Hadwenii.*

B. Harrisoniæ (Mrs. Harrison's). *fl.* 3in. across; sepals and petals creamy-white, large and fleshy, the lateral ones with a spur-like base; lip purple, yellowish at base, purple-veined outside, the inner surface streaked red; scape one- or two-flowered. *l.* solitary, large, oblong-lanceolate, plaited. Pseudo-bulbs pyriform, tetragonal. Brazil. SYNS. *Colax Harrisoniæ, Dendrobium Harrisoniæ* (H. E. F. 120), *Lycaste Harrisoniæ, Maxillaria Harrisoniæ* (B. M. 2927; B. R. 897; P. M. B. ii. 196).

B. H. alba (white). *fl.* white; sepals slightly tinged green, the lower sides of the lateral ones faintly dotted red; side lobes of the lip reddish-purple, veined with deeper red, the middle lobe red-purple, hairy, the spur-like portion greenish-white. Brazil. (R. G. 52, under name of *Maxillaria Harrisoniæ alba.*)

B. H. eburnea (ivory-white). *fl.*, sepals and petals white; lip white, freely striped with crimson; throat yellow, striped purplish-red. April and May. Brazil. A chaste variety. (W. O. A. iii. 100, under name of *Lycaste Harrisoniæ eburnea.*)

B. H. grandiflora (large-flowered). *fl.*, inner surface of the lip wholly purple, except a narrow, yellowish border; spur yellow, with a few bold, purple stripes.

B. H. purpurascens (purplish). *fl.*, sepals and petals of a light plum-purple; front lobe of lip a darker shade of the same colour.

B. inodora (scentless). *fl.* about 3in. across; sepals pale green, oblong, obtuse; petals brighter, but smaller; lip white, yellow, or dull rose-colour, three-lobed, the middle lobe hairy and reflexed, the side ones erect. Otherwise like *B. Harrisoniæ.* Rio de Janeiro, 1839. (R. X. O. i., t. 94, f. 1.) SYN. *B. aurantiaca,* of gardens (W. O. A. ix., t. 386).

B. racemosa (racemose). *fl.* pale, dirty straw-colour, with a white lip, slightly speckled with pale crimson; lateral sepals much elongated at base; raceme few-flowered, pendulous. *l.* solitary, oblong, arched, three-ribbed, shorter than the scape. Pseudo-bulbs small, aggregated. Brazil. SYN. *Maxillaria racemosa* (B. M. 2789; L. B. C. 1318).

B. tyrianthiana (Tyrian). *fl.* reddish-purple, 3½in. across; dorsal sepal erect, the lateral ones broader, connate at base with the hairy foot of the column; lip much smaller, stoutly clawed, three-lobed; scape about three-flowered. *l.* 6in. long, 2in. to 3in. broad. Pseudo-bulbs 3in. long, three-angled. Brazil, 1893. (B. M. 7461; L., t. 446.)

BIG BUD. *See* **Currant-Bud Mite.**

BIGELOVIA (of Sprengel). A synonym of **Spermacoce** (which *see*).

BIGENERIC. A term applied to a hybrid between plants of different genera.

BIGNONIA. This genus embraces about 120 species, all American, and mostly tropical. To those described on p. 189, Vol. I., the following should be added. Several species formerly included here are now referred to **Adenocalymna, Amphilophium, Catalpa, Chilopsis, Distictis, Jacaranda, Macfadyena, Pawlownia, Pithecoctenium, Spathodea, Stereospermum, Tabebuia,** and **Tecoma.**

B. buccinatoria (trumpet-like). The correct name (B. M. 7516) of *B. Cherere.* SYN. *Pithecoctenium buccinatorium.*

B. Catalpa (Catalpa). A synonym of *Catalpa bignonioides.*

B. Chamberlaynii (Chamberlayn's). A synonym of *Anemopægma racemosum.*

B. chrysantha. The correct name is *Tabebuia chrysantha.*

B. leucantha. The correct name is *Dictictis leucantha.*

B. pallida. The correct name is *Tabebuia leucoxyla.*

B. perforata (perforated). *fl.* disposed in a short, terminal raceme; calyx inflated, with torn margins; corolla 2in. long, pubescent outside. August. *l.* trifoliolate and conjugate; leaflets stalked, ovate, pellucid-dotted. Brazil, 1881. Plant tomentose.

B. purpurea (purple). *fl.* bright rose-purple with a pale throat, rather large; limb spreading, the five divisions emarginate; cymes axillary, many-flowered. *l.*, leaflets two or sometimes three, petiolulate, acuminate, 3in. to 4in. long, entire or slightly toothed. South America, reintroduced in 1898. (B. M. 5800; G. C. 1898, ii., p. 393, f. 114.)

B. regalis (royal). *fl.* bright yellow and red, large and exceedingly beautiful. *l.* opposite, elliptic-lanceolate. British Guiana, 1885. A very handsome climber.

B. Rodigasiana (Rodigas'). *l.* bright green, with white variegations, tinted with rosy-red when in a young state. 1893. (I. H. 1893, t. 183.)

B. rugosa (wrinkled).* *fl.* in small, shortly stalked, axillary cymes; corolla primrose-coloured, the tube 2in. to 2½in. long, slightly curved, the limb short, five-lobed. October. *l.* bifoliolate; leaflets 3in. to 4in. long, oblong, acuminate, rounded or cordate at base; petioles 1in. to 1½in. long, ending in a bifid tendril. Caraccas, 1890. Plant hairy. (B. M. 7124.)

B. spectabilis. The correct name is *Tabebuia spectabilis.*

B. venusta. *fl.*, corolla deep orange (not crimson). SYN. *Pyrostegia ignea.*

BILLARDIERA. SYN. *Labillardiera.* The six species forming this genus are all natives of extra-tropical Australia. To the species described on p. 189, Vol. I., the following should be added:

B. cymosa (cymose). *fl.* bluish or violet-purple; corymbs several-flowered, shortly pedunculate or nearly sessile. *l.* usually lanceolate or oblong-linear, sessile or nearly so, obtuse or shortly pointed. Branches more or less twining, or sometimes short and flexuous. 1868.

BILLBERGIA. Including *Helicodea.* According to J. G. Baker's monograph of the *Bromeliaceæ*, this genus embraces about three dozen distinct species, natives of tropical South America. To the species, varieties, &c., described on pp. 190-1, Vol. I., the following should be added:

B. amabilis (lovely). A synonym of *B. vittata.*

B. amœna is a synonym of *B. speciosa.*

B. andegavensis (Angers). *fl.* having a spreading limb, the tube and centre dark red, broadly bordered with violaceous-indigo; bracts bright red; peduncle arching, mealy-white. *l.* broad, obtuse, pale green. 1886. A garden hybrid between *B. thyrsoidea* and *B. Moreli.*

B. aurantiaca (orange). A garden synonym of *Karatas Laurentii.*

B. Bakeri (B. H. 1880, p. 166, t. 8). The correct name of *B. pallescens* (B. M. 6342).

B. Baraquiniana is identical with *B. decora.*

B. bicolor (two-coloured). A form of *B. pyramidalis.*

B. Binoti (Binot's). *fl.*, bracts, stem, &c., red; inflorescence pendulous. *l.* in a rosette, deep green above, the lower portion tinted with reddish-purple; under-surface light green, lined with white. Organ Mountains, Brazil, 1896. Allied to *B. speciosa.*

B. bivittata (twice-striped). A synonym of *Cryptanthus bivittatus.*

Billbergia—*continued.*

B. Blireiana (Blire's). *fl.* sub-sessile; sepals green, pink, and blue; petals green at base, with indigo-blue lobes. A garden hybrid between *B. nutans* and *B. iridifolia.* 1839.

B. Breauteana (Breauté's). A synonym of *B. vittato-Bakeri.*

B. Brongniarti (Brongniart's). A synonym of *Portea kermesina.*

B. Bruanti (Bruant's). *fl.*, calyx very pale green, tipped with blue; corolla very pale yellowish-green; bracts dark red; peduncle rosy, slender, nearly as long as the leaves. *l.* green, obtuse, toothed, forming a cup-like rosette. 1885. A garden hybrid between *B. pallescens* and *B. decora.*

B. Canteræ (Canter's). *fl.* pale greenish-yellow; bracts deep rose-colour, large; inflorescence pendulous, shorter than the leaves. 1897. A handsome plant, belonging to the section *Helicodea.* (R. H. 1897, p. 60.)

B. Cappei (Cappe's). A synonym of *B. vittato-Bakeri.*

B. Croyiana (Croy's). A variety of *B. pyramidalis.*

B. decora (comely). *fl.*, petals greenish, 2in. long, curling up spirally from the base; spike dense, pendulous, simple, 3in. to 4in. long, almost hidden by the large, bright red, oblong-lanceolate bracts; peduncle 1ft. long. January. *l.* eight or ten in a rosette, lorate, acute, 1½ft. to 2ft. long, 2in. broad in the middle, dilated and clasping at base, with transverse, mealy bands, the margins spiny. Para, 1864. (B. H. 1875, p. 221, tt. 13, 14; B. M. 6937.) SYNS. *B. Baraquiniana* (I. H. 1864, 421), *Helicodea Baraquiniana.*

B. decoro-nutans (hybrid). *fl.* few, racemose, about 3in. long; sepals iridescent, reddish at base, blue at the tips, ½in. long; corolla greenish-yellow, the lobes 2in. long, circinately rolled up; bracts rich, bright rosy-crimson, boat-shaped, broadly lanceolate, acuminate; peduncle cylindrical, glabrous, pendulous, 1ft. long. Belgian gardens, 1884. A pretty hybrid. SYN. *B. Windi.*

B. Enderi (Ender's). A synonym of *Quesnelia Enderi.*

B. Euphemiæ (Mme. Morren's).* *fl.* six to twelve in a lax, drooping spike 3in. to 4in. long, nearly sessile, the lower ones subtended by large bracts; sepals reddish, horny; petals about 2in. long, with greenish-yellow claws and bright violet tips; peduncle 1ft. long. April. *l.*, produced ones five or six in a closely convolute rosette, about 1ft. long, 1½in. to 2in. broad, horny, narrowed to an acute point, lepidote-scaly, the margins minutely prickly. South Brazil. (B. H. 1872, tt. 1-2; B. M. 6632.)

B. Euphemiæ-speciosa (hybrid). A hybrid between the species indicated. SYN. *B. Euphemiæ amœna.*

B. farinosa (mealy). A synonym of *B. zebrina.*

B. fasciata (banded). A synonym of *Æchmea fasciata.*

B. Gireoudiana (Gireoud's). *fl.* in an upright spike; calyx rose, faintly bluish towards the tips; petals twice as long as the sepals, blunt, the claw reddish-white at the base, blue at the tip; peduncle white, with carmine-red bracts. *l.* broadly strap-shaped (the inner ones rolled round each other into a wide tube), finely serrated, striped red beneath, deep blackish-purple towards the base. A garden hybrid between *B. Saundersii* and *B. thyrsoidea.*

B. Glaziovii (Dr. Glaziou's). A synonym of *Quesnelia strobilispica.*

B. Glymiana (Glym's). A synonym of *B. Morelli.*

B. horrida (horrid). *fl.* borne in a simple, erect spike, 3in. to 4in. long; petals pale green, tipped with violet, 1½in. long, falcate from the top of the calyx; peduncle 1ft. long. *l.* about ten in a utricular rosette, 1ft. to 1½ft. long, 2in. to 2½in. broad, connivent for the lower 6in. to 9in., deltoid-cuspidate at the tip, the marginal prickles more conspicuous than in any other species. Brazil, 1856. (B. H. 1876, t. 22; R. G. 1859, t. 272.)

B. h. tigrina (tiger-striped). *fl.*, petals narrow, 2in. long. *l.* brown, copiously banded with white on the back.

B. ianthina (violet). A garden synonym of *B. Leopoldi.*

B. intermedia (intermediate). A garden name for *B. vittato-nutans.*

B. Jenischiana (Jenisch's). A hybrid between *B. pyramidalis* and *B. Moreli.*

B. Krameriana (Kramer's). A hybrid between *B. pyramidalis* and *B. speciosa.*

B. leodiensis (Liége). A garden name for *B. vittato-nutans.*

B. Leopoldi (Leopold's).* *fl.* in a dense, oblong spike 6in. to 9in. long; petals violet, 2in. long; peduncle drooping, 1½ft. long, the upper six or eight leaves bright red. Summer. *l.* eight to ten in a rosette, 3ft. to 3½ft. long, 2in. to 2½in. broad, connivent for 1ft., horny, channelled, transversely fasciated with white on the back, the marginal prickles small. Island of Santa Catherina, Brazil, 1847. (B. H. 1871, tt. 1-4.) SYNS. *B. ianthina* and *B. nuptialis* (of gardens), *Helicodea Leopoldi* (I. H., under t. 421).

B. Liboniana. (B. H. 1877, p. 57, t. 34; F. d. S. 1043; L. J. F. t. 197.)

B. macrocalyx (large-calyxed). *fl.* in a drooping raceme 3in. to 4in. long; petals green, tipped with violet-blue, 1in. longer than the calyx; peduncle mealy, 1ft. long, with five or six red bract-leaves. April. *l.* only three or four in a rosette,

Billbergia—*continued.*

lanceolate, 1½ft. to 2ft. long, 2in. broad, horny in texture, connivent for 1ft., white-lepidote on the back, with a few transverse bands. Bahia, 1859. (B. H. 1860, t. 19; B. M. 5114.)

B. Moreli. This is one of the finest species. SYNS. *B. Glymiana* (B. H. 1866, p. 134, t. 11), *B. Wetherilli* (B. M. 4835), but not *B. Moreliana.*

B. Moreliana is a synonym of *B. vittata*, not of *B. Moreli.*

B. Morreniana (Prof. Morren's).* *fl.* borne in a lax, sub-erect spike 3in. to 4in. long, with a red, flexuous rachis; petals green, tipped with violet-blue, 1in. longer than the calyx; peduncle shorter than the leaves, its bract-leaves red. December. *l.* eight to ten in a rosette, connivent in the lower 3in. to 4in., above 1ft. long, 1in. broad, whitish on the back. Origin unknown; it flowered at Kew in 1887. SYN. *B. Reichardti.*

B. nuptialis (nuptial). A garden synonym of *B. Leopoldi.*

B. nutanto-Moreli (hybrid). *fl.* about a dozen; calyx rosy and blue; corolla dark blue; peduncle adorned with numerous rosy bracts, long, slender, arching. 1885. A graceful and ornamental hybrid between *B. nutans* and *B. Moreli*, having the outer leaves narrow, as in *B. nutans*, and the inner ones broader, as in *B. Moreli.* SYN. *B. Worleyana.*

B. pallescens, of Baker (B. M. 6342). The correct name of this is *B. Bakeri.* The *B. pallescens* of Koch (described in Vol. I.) is a variety of *B. speciosa.*

B. pallida is a synonym of *B. speciosa.*

B. Perringiana (Perring's). A hybrid between *B. Liboniana* and *B. nutans*, having leaves like the former species and an inflorescence like the latter. 1890. (R. G. 1890, p. 145, t. 1318.)

B. polystachya (many-spiked). A synonym of *Æchmea distichantha.*

B. Porteana (Porte's).* *fl.*, petals green, lanceolate, above 2in. long, rolling up spirally and disclosing the violet-purple filaments; spike loose, simple, drooping, 6in. to 8in. long; peduncle 2ft. long, with several bright red bract-leaves. August. *l.*, produced ones five or six in a rosette, erect, lorate, 3ft. to 4ft. long, dull green, tinted on the back with claret-purple, and transversely banded with white. Bahia, 1849. Plant stemless. One of the finest species. (B. H. 1876, p. 9, t. 1; B. M. 6670.)

B. pyramidalis. SYN. *Bromelia pyramidalis.*

B. p. bicolor (two-coloured). *fl.* with the two colours (purple and red) not so much blended as in the type. *l.* more distinctly fasciated on the back. Rio Janeiro, 1829. (B. R. 1181.) SYN. *B. bicolor* (L. B. C. 1819).

B. p. Croyiana (Croy's). *fl.* more numerous, and peduncle longer, than in the type; petals red, edged with violet. *l.* erect, with conspicuous dorsal zones. (L. J. F. 413.) SYNS. *Æchmea setigera, B. setosa* (both of gardens).

B. Quesneliana is now correctly known as *Quesnelia cayennensis.*

B. Quintutiana (Quintut's). A synonym of *B. Saundersiana.*

B. Rancougnei (Rancougne's). *fl.*, corolla bluish-green, tipped with indigo, 2in. long; stamens indigo; bracts rosy, woolly-tomentose at the base, together with the ovary and calyx; peduncle 3ft. high. *l.* 3ft. long, 2½in. broad, spreading-recurved, finely toothed. 1884. A hybrid, of which *B. Liboniana* is one of the parents.

B. Reichardti (Reichardt's). A synonym of *B. Morreniana.*

B. rhodocyanea (red and blue), of Lemaire. A synonym of *Æchmea fasciata.*

B. rosco-marginata (SYN. *B. rubro-marginata*) is now correctly known as *Quesnelia rufa.*

B. Sanderiana (Sander's). *fl.* 2in. long; calyx and corolla green, tipped with blue; bracts rosy, with one to three flowers to each; panicle pendulous. December. *l.* erect, broad, green, coriaceous, obtuse, mucronate, armed with stout spines on the margins. South Brazil, 1885. A fine plant. (B. H. 1884, 1, 2.)

B. sanguineum (blood-coloured). *fl.* few on a spike; calyx tube greenish; corolla much longer, scarlet, with violet-purple tips to the segments; bracts scarlet, large, boat-shaped, occurring all along the spike. *l.* about 10in. long, deep green, with tiny grey spots, the marginal spines remote. 1893. Allied to *B. Bruanti.*

B. Saundersiana. *B. Quintutiana* (R. G. 1890, p. 202, f. 49) is identical with this species.

B. setosa (bristly). A garden synonym of *B. pyramidalis Croyiana.*

B. speciosa (showy). The correct name of *B. amœna* (B. H. 1875, tt. 1-4). SYN. *B. pallida. B. pallescens* (of Koch), *B. Thunbergiana*, and *B. Wigtiana* are forms of this species.

B. sphacelata (scorched). A synonym of *Greigia sphacelata.*

B. splendida (splendid). A variety of *B. thyrsoidea.*

B. Thunbergiana (Thunberg's). A form of *B. speciosa.*

B. thyrsoidea. This is scarcely more than a variety of *B. pyramidalis.* (B. H. 1873, p. 295, t. 17; L. J. F. t. 267; P. F. G. iii. t. 74.)

B. t. longifolia (long-leaved). *l.* longer than in the type, and narrowed gradually towards the apex.

Billbergia—*continued.*

B. t. splendida (splendid). *fl.* bright-coloured, more numerous than in the type; bracts broader. Plant more robust. 1883. (L. J. F. tt. 181-2.)

Other forms are *Lemoinei, miniato-rosea, Paxtoni, rhodocyanea* (of gardens, not of Lemaire), and *Schultesiana.*

B. vexillaria (standard-bearing). *fl.* having petals of a brilliant dark violet, obtuse and revolute at the tips. *l.* robust, 1½ft. to 2ft. long. A garden hybrid between a variety of *B. thyrsoidea* and *B. Moreli.* 1889. (R. H. 1889, p. 467, f. 118 and plate.)

B. viridiflora (green-flowered).* *fl.* green, in a lax, ascending or cernuous raceme, 6in. to 12in. long; peduncle 1ft. to 1½ft. long, with bright red, ascending bract-leaves. *l.* twelve to fifteen in a rosette, 1½ft. to 2½ft. long, 1½in. to 2in. broad, connivent for 1ft., sometimes tinged with purple, the marginal prickles very minute. Brazil, 1854. A very distinct species. (B. H. 1874, tt. 1-2; 1876, tt. 20-21; F. d. S. 1019-20.)

B. vittata. *B. amabilis* (B. H. 1874, tt. 1-2), *B. Moreliana* (L. J. F. t. 136), *B. zonata*, and *Tillandsia Moreliana* are identical with this species.

B. v. Rohani (Rohan's). This so-called variety is not distinguishable from the typical plant. 1890. (R. G. 1890, p. 306, f. 60.)

B. vittato-Bakeri (hybrid). *fl.* pale flesh-colour, with violet tips; bracts bright rose, lanceolate; peduncle shorter than the leaves, recurving, glabrous. *l.* 2ft. long, 2in. broad, recurving, lorate, obtuse, slightly channelled, rather thin, bordered with five distant teeth, bright green above, striated and with mealy-white zones below. 1884. A garden hybrid between the species indicated. SYNS. *B. Brocauteana* (R. H. 1885, p. 300), *B. Cappei.*

B. vittato-nutans (hybrid). *fl.* few, in a lax, drooping spike; petals bright violet-blue, twice as long as the calyx; peduncle 1½ft. long, with many large, bright red, ascending bract-leaves. March. *l.* a dozen or more in a rosette, lanceolate, 1½ft. to 2ft. long, recurving from low down. SYNS. *B. intermedia* and *B. leodiensis* (R. G. 563, f. 100-101). There is another form of this hybrid with shorter and stiffer leaves.

B. Wetherilli (Wetherill's). A synonym of *B. Moreli.*

B. Windi (Wind's). A synonym of *B. decoro-nutans.*

B. Wiotiana is a form of *B. speciosa.*

B. Wittmackiana (Wittmack's). A garden hybrid between *B. vittata* and *B. amœna.* 1891. (R. G. 1891, p. 328, f. 69.)

B. Worleyana (Worley's). A synonym of *B. nutanto-Moreli.*

B. zebrina. *B. farinosa* and *Bromelia zebrina* (B. M. 2626) are identical with this species.

B. zonata (zoned). A garden synonym of *B. vittata.*

BILLIOTTIA (of Brown). A synonym of **Agonis** (which *see*).

BILLIOTTIA (of Colla). A synonym of **Calothammus** (which *see*).

BINE. A climbing or twining stem; *e.g.*, Woodbine.

BINECTARIA. A synonym of **Imbricaria** (which *see*).

BIONIA. A synonym of **Camptosema** (which *see*)

BIORHIZA APTERA. *See* **Oak Galls.**

BIPINNATISECT. Having the divisions of a pinnatisect leaf themselves pinnatisect, *i.e.*, cut to the midrib, but with sessile segments.

BIRCHEA. A synonym of **Luisia** (which *see*).

BIRD-OF-PARADISE FLOWER. *See* **Strelitzia.**

BIRDS. Popularly, all Birds are supposed to be beneficial to the gardener and the farmer. That they are not, however, practical observation will tend to show. Many representatives of the Class *Aves* are working in the interests of the gardener; while a larger number are absolutely injurious. Then there is still a third section whose exact position as regards horticulture and agriculture it is not easy to define. They are, perhaps, seed-eaters, or it may be fruit-eaters, and insectivorous—omnivorous, in fact. The point to determine in this case is whether in the aggregate the damage in the one case is not more than counterbalanced by the good in the other—often a most difficult matter for even the most experienced. Here it is only possible to give the most cursory glance at an interesting subject. We can only

Birds—*continued.*

mention the chief amongst the migrants and the permanent dwellers, weighing as far as possible their merits and demerits. As a general rule, insectivorous Birds have a slender and more or less elongated beak; while in the seed-eaters this structure is bulky and short.

Commencing with the *Corvidæ*, we have some very familiar species in the Rook, Magpie, and Jay. The Rook *(Trypanocorax frugilegus)* is on the whole one of the most useful Birds that we have, as it is one of the most persecuted. Generally its food consists of insects—insects, too, of the most destructive kind, such as the grubs of the Skipjack Beetles (Wireworms), Daddy Long-legs (Leather Jackets), and Cockchafers. In the process of searching for these in pastures and lawns, the grass is frequently ripped up and rendered most unsightly; but of the benefit in such cases where insecticides are powerless, there cannot be any doubt. The worst that can be said against the Rook in gardens and orchards is that it will forsake its insect dietary for one of fruit or vegetables, when anything from Walnuts and Pears to young Potatoes will be laid under contribution. The Jay *(Garrulus glandarius)*, a fast disappearing species, is an enemy, as the Bird will make short work of fruit of any kind as well as Peas.

FIG. 171. HAWFINCH.

To the *Sturnidæ* belongs one of the most useful Birds, alike to farmer and gardener, in the Common Starling *(Sturnus vulgaris)*. That it makes a raid upon Cherries is perfectly true, but that it well earns them, by destroying myriads of Wireworms and Leather Jackets, is well known to everyone who has paid attention to the subject.

A very large family, the *Fringillidæ*, next claims attention. In it are found some of the most destructive species—the Bullfinch *(Pyrrhula europæa)* for instance. For Gooseberry and Currant bushes this Bird has a special fondness, denuding them almost entirely of their buds. A somewhat local species is the Hawfinch

Birds—*continued.*

(Coccothraustes coccothraustes) (Fig. 171); but it is a destructive one so far as the fruit-grower is concerned, being especially fond of stone fruits. The Greenfinch *(Chloris chloris)* is one of the commonest Finches, and a seed-eater in the main, though, like many others, it brings up its family upon insects. And similarly of the Chaffinch *(Fringilla cœlebs)*, which generally is voted a nuisance by gardeners. The Goldfinch (*Carduelis carduelis*), one of the handsomest of British birds and now one of the most local, is useful, as it feeds almost entirely upon thistles. The Linnet *(Cannabina cannabina)* must not be regarded unfavourably, although entirely a seed-eater, as it devours vast quantities of injurious weeds, such as Charlock. More destructive than either of the Finches above named is the ubiquitous House Sparrow *(Passer domesticus)*. In fact, it may be said to enjoy the reputation of being the most destructive of all Birds to farm and garden produce. Undoubtedly it takes insects when nesting, yet the damage it does at other times is enormous, as set down by Tegetmeier in his monograph. The Buntings are, on the whole, harmful, though the familiar Yellow Bunting, or Yellow-Hammer *(Emberiza citrinella)*, is one of the least so, as it captures in the summer immense numbers of injurious caterpillars to feed its rather numerous family, frequently six.

Passing over the Larks *(Alaudidæ)* as being seed-eaters, and, so far as the farmer is concerned, doing more harm than good, we come to the *Motacillidæ*. This includes several most useful species in the Wagtails, of which the graceful Dishwasher, or Pied Wagtail *(M. lugubris)*, is the best known. This Bird may frequently be seen working lawns and grass land for insects, on which it entirely subsists. The Yellow Wagtail *(M. campestris)* is a field species, and as industrious an insect forager as its Pied relative.

In the *Certhiidæ*, or Creepers, there is at least one species which ventures near the haunts of men. This is the Tree Creeper *(Certhia familiaris)*, an active little Bird whose method of progression reminds one of the Woodpeckers. It lives upon insects found upon tree-trunks and branches.

The Tits, again *(Paridæ)*, furnish omnivorous species which are amongst the best known of native Birds. Alike in town and country, the Great Tit *(Parus major)* and the Blue Tit *(P. cæruleus)* haunt our very houses; while even the scarcer Coal-Tit *(P. britannicus)* will sometimes venture into suburban gardens and orchards. The Marsh Tit *(P. Dresseri)* is another garden-frequenting species, despite its popular name. In spring those Tits which visit gardens play havoc with the fruit-buds, and particularly those of Gooseberries and Currants. Possibly it may be that the damage done is in the search for insects, of which latter they eat a large number. Later, ripe Pears are often spoiled by the Blue Tit. Occasionally Tits will attack vegetable crops like Peas, when the damage is usually ascribed to other species. The method of attack in such cases should becarefully noted.

One species in the *Laniidæ*, or Shrikes, calls for mention. This is the Red-Backed Shrike, or Butcher Bird *(Lanius collurio)*, a summer visitor, and by no means plentiful. Its method of catching its prey and impaling it upon thorns, is well known to Bird-lovers. Beetles and Wasps are favourite foods, and the Bird must be regarded as highly beneficial to gardeners and farmers.

Amongst the Warblers *(Sylviidæ)* the most familiar are the Whitethroat *(Sylvia sylvia)* (Fig. 172) and the Lesser Whitethroat *(S. curruca)*. Both are practically insectivorous, consuming vast quantities of Aphides and small caterpillars, but at times they will attack small fruits as well as Peas in the pod. Useful, too, is the Willow Warbler *(Phylloscopus trochilus)*, which arrives in late spring, and may be found in gardens industriously searching the foliage of fruit and other trees for insect-

Birds—*continued.*

food. Another near relative, the Chiff-Chaff *(P. minor)*, whose call-note has given rise to the popular name it bears, is no less assiduous as an insect-forager. Frequently the Blackcap *(Sylvia atricapilla)* may be seen in gardens industriously clearing off insects. It is a migrant, and one whose song rivals that of the Nightingale.

The Thrush family *(Turdidæ)* is rich in garden-frequenting species like Song Thrushes, Blackbirds, and Robins; while it also contains that prince of songsters, the Nightingale *(Daulias luscinia)*. The members of this family, at any rate, in the young state, should

FIG. 172. WHITETHROAT.

be readily discriminated from their allies by the fact that they are spotted. Much as we may admire the Blackbird *(Merula merula)* for its period of song (short though it be as compared with the Song Thrush), any good that it may do in keeping down insects is sadly discounted by its destructive propensities in the fruit-garden. It is a fruit-robber of the most pronounced type. Large and small fruits are alike attacked. To Strawberries, Plums, and Gooseberries it is particularly partial; while its boldness could hardly be exceeded. The Song Thrush *(Turdus musicus)*, on the other hand, subsists chiefly upon insects, worms, slugs, and snails. Towards the end of summer, however, orchard and other fruits are attacked—Figs, Apples, Pears, and Plums being most relished. The Bird, however, cannot be regarded in the same light as the Blackbird. The Robin, or Common Redbreast *(Erithacus rubicula)*, is a most useful species; and so is the Common Nightingale, which, during its all too short stay with us, is an insect-feeder. The Wheatear *(Saxicola œnanthe)* (Fig. 173), the Furze-Chat *(Pratincola rubetra)*, and the Stone-Chat *(P. rubicola)*, all belonging to the family under discussion, render the greatest service to farmers.

The Accentors *(Accentoridæ)*, of which the Hedge Sparrow *(Tharrhaleus modularis)* is one of our commonest garden inhabitants, is a species deserving protection, as it destroys quantities of insects in early spring and summer. Its correct name is Hedge Accentor.

Of the *Troglodytidæ*, or Wrens, the most familiar species is the Common Wren *(Anorthura troglodytes)*. This is another ubiquitous species, and one, too, very beneficial

Birds—*continued.*

in gardens, as it is an insect-feeder. Another small Bird held in great esteem is the Common Flycatcher *(Muscicapa grisola)*, of the family *Muscicapidæ*. It is a migrant, and the usual method adopted of swooping down upon some unfortunate insect for which it has been watching is fairly familiar. At other times the insects are taken from the ground position. Aphides and Sawfly larvæ (the latter not relished by many insectivorous birds) are destroyed by the Spotted Flycatcher in vast numbers.

Amongst summer Bird visitors to these islands the advent of none is more eagerly anticipated than that of the Swallows *(Hirundinidæ)*, all of which should be carefully preserved. These include the House Martin *(Chelidon urbica)*, Sand Martin *(Clivicola riparia)*, and the Chimney Swallow *(Hirundo rustica)*. They are entirely insectivorous, and their nests should always be protected.

Mention must now be made of the true Cuckoos *(Cuculinæ)*, one species of which is familiar, at least, by sound. It is a much maligned Bird, but it is one which deserves well of both farmer and gardener. Entomologists are well aware of the caution exhibited by insectivorous birds generally in attacking woolly caterpillars. The Common Cuckoo *(Cuculus canorus)* is, however, one of the exceptions which go to prove the rule. We have seen it clear off the hairy Tiger Moth caterpillars from a Lettuce patch; and also make short work of distasteful Sawfly larvæ like those affecting Currant and Gooseberry bushes.

Belonging to the *Strigidæ* is the Barn Owl *(Strix flammea)*, whose useful qualities cannot be sufficiently well-known, or the Birds would be better protected. They live largely upon mice, but will not hesitate to take the larger rodents like rats. Equally serviceable and worthy of protection is the Kestrel Hawk, or Windhover *(Cerchneis tinnunculus)* (Fig. 174), which feeds upon mice, upon many of the injurious hard-bodied beetles like Cockchafers, as well as upon Grasshoppers. This species may be readily distinguished from the destructive (so far as gamekeepers are concerned) Sparrow-hawk by its method of "hovering" in the air.

Of the Birds now remaining that ought to be mentioned, the Lapwing, or Peewit *(Vanellus vanellus)*, is one of the most useful, as its dietary consists of insects and slugs,

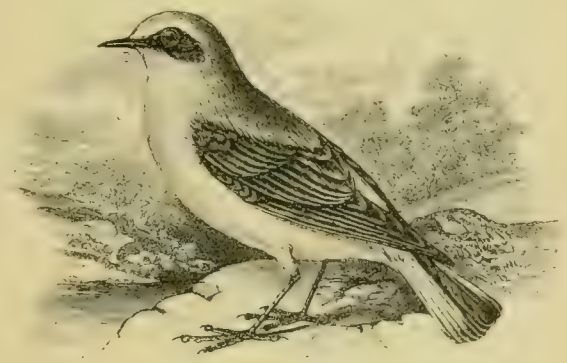


FIG. 173. WHEATEAR.

and flocks of the Birds may be seen in summer searching for food in pasture-lands. Vast numbers of eggs are used for food each spring, and as a big price is set upon them, every encouragement is given to the destruction of the species. Another is the Wood Pigeon *(Columba palumbus)*, which will make short work of

Birds—*continued.*

any Peas in its near neighbourhood, and is therefore undesirable.

Much may be done towards keeping destructive Birds at bay by netting fruit and other trees; Carnation "grass," for the succulent shoots of which Sparrows are extremely fond; and flowers. Black cotton, too, stretched diagonally across rows of Peas and early spring flowers

FIG. 174. KESTREL.

—Wallflowers, Crocuses, Polyanthuses, Primroses, and the like—affords considerable protection, as the Birds dislike getting their wings mixed up with the cotton. In addition it has been found useful to strew lime upon fruit bushes, as this acts as a deterrent if the applications are persisted in.

BIRD'S-BILL. A common name for *Trigonella ornithopodioides.*

BIRD'S EYE ROT. *See* **Grape Rot.**

BIRD'S-EYES. *See* **Veronica Chamædrys.**

BIRD'S-FOOT TREFOIL. *See* **Lotus.**

BIRD'S-TONGUE. *See* **Ornithoglossum.**

BIRD'S-TONGUE FLOWER. *See* **Strelitzia.**

BISEXUAL. Hermaphrodite; containing both sexes; *e.g.*, in a flower, both stamens and pistil.

BISHOP'S WORT. *See* **Stachys japonica.**

BISMARCKIA (commemorative of the great German statesman). ORD. *Palmæ.* An imperfectly-known genus. *B. nobilis*, the only species, is an ornamental Palm, with somewhat the habit of a Pritchardia. For culture, *see* **Stevensonia.**

B. nobilis (noble). *fr.* one-celled, with two rudimentary cells; seeds ovoid, deeply wrinkled. *l.* large, digitately divided into from eight to ten long-linear segments and several drooping, thread-like ones. Madagascar, 1885. (R. G. 1220.)

BISTON HIRTARIUS. *See* **Brindled Beauty Moth.**

BISTORT. *See* **Polygonum Bistorta.**

BITTER BARK TREE. *See* **Pinckneya pubens.**

BITTER CUCUMBER. *See* **Citrullus Colocynthis.**

BITTER DAMSON. *See* **Simarouba amara.**

BITTER OAK. *See* **Quercus Cerris.**

BITTER ROT. *See* **Apple Rot.**

BITTER WOOD. *See* **Simarouba** and **Xylopia.**

BIZARRE. *See* **Carnation.**

BLACK ADIANTUM. *See* **Asplenium Adiantum-nigrum.**

BLACK ARCHES MOTH (*Psilura dispar*). Though in Germany this is one of the worst pests of the forester, yet here, where it is fairly common, it does little, if any, damage. Occasionally it is found on Apple trees, but not in sufficient numbers to warrant measures for its destruction being taken. On the Continent vast sums of money have been spent with a view of devising methods for keeping the pest under, so destructive is it to Firs. As in the case of the Cockchafer in France, an attempt has been made in Germany to destroy the Black Arches by infecting it with fungi, but without any real good resulting. The insect is described and illustrated in Vol. II., under **Liparis.** In Germany the pest is popularly known as "Die Nonne," or "The Nun," as the specific name denotes.

BLACKBERRY (*Rubus fruticosus*). This fruit is so well known that any description is unnecessary. No doubt its freedom of growth in all parts of the country has been the cause of its neglect as a cultivated fruit. When given a good soil and an open situation, and the exhausted or very weak shoots are cut out annually, it is wonderful how great a crop of fine fruit is produced. The best time to prune is immediately after all the fruit is gathered, and in the early spring a mulch of farmyard manure is very beneficial. Nearly all our native large-fruited forms of the Blackberry are equal to any we have procured from America in size of fruit and weight of crop, when grown under similar conditions. In fact, one of the best so-called American varieties (the Parsley-leaved), is really an English one; it is very fruitful and ornamental in foliage. Other good varieties are: Wilson, jun., Kittalinny, and Mitchell's Seedling. All these are excellent, and will succeed almost anywhere, and form a pretty feature in the wild garden, or for covering arbours.

BLACK BOY. *See* **Xanthorrhœa.**

BLACK CANKER. *See* **Athalia spinarum.**

BLACK CURRANT. *See* **Ribes nigrum** and **Currant.**

BLACK CURRANT GALL MITE. *See* **Currant-Bud Mite.**

BLACK KNOT (*Plowrightia morbosa*) is a virulent fungoid disease of Plums and Cherries happily not found in this country. In America, however, it is very common, and most difficult to deal with when once it has taken a firm hold. The fungus is well characterised, and eventually produces a knotting of the twigs and branches. The affected portions first swell and then crack, disclosing numberless dark green spores over the parts laid bare. According to Dr. Halsted (who has made the fungus a special study), the young knots and the fresh growth of older ones as the season advances "lose their olive velvety appearance, turn a dark colour, and develop a hard incrustation on the surface. Within the substance of this black and brittle layer many spherical pits are formed, and as winter advances minute sacs are produced upon the wall of the cavity, that toward spring bear each eight oval bodies known as sac-spores. These escape from their long sacs, and pass out through a pore at the top of the cavity, and are then carried by the winds to the surface of a young Cherry or Plum twig, and thus begin another knot, which in course of time produces a new crop of summer and another of winter spores, and thus the disease is preserved and propagated." The treatment consists in light cases in cutting out the "knots" and carefully burning them, but in severe cases the trees have to be rooted up and burned.

BLACK PALMER. *See* **Athalia spinarum.**

BLACK PARSLEY. *See* **Thapsia decipiens.**

BLACK POPLAR. *See* **Populus nigra.**

BLACK RASPBERRY. *See* **Rubus occidentalis.**

BLACK ROOT. *See* **Symphytum officinale.**

BLACK ROT OF CABBAGE and other *Cruciferæ* is of bacterial origin, and the disease is scientifically known as *Pseudomonas campestris*. Though principally found in the United States it has been recorded in this country. Dr. E. F. Smith, in the United States Department of Agriculture, fully describes it in one of the Bulletins (68). Judging from his report, Cabbage and other cruciferous plants may be attacked at any stage. The symptoms may consist of a dwarfing or one-sided growth of the heads, by the absence of any heads, or by the death of the plant. Further, he says: "Occasionally the heads rot and fall off. . . . If the stumps of affected plants are broken or cut across, a brown or black ring will be observed corresponding to the woody part of the stem, this being the part specially subject to the disease. In bad cases this blackening may be easily traced upwards into the centre of the head, and is generally worse on one side In the leaves the symptoms usually begin at the margins, and consist in the yellowing of all affected parts except the veins, which become decidedly brown or black."

Affected foliage should be uprooted and burned, and in bad cases the whole plant should be similarly treated. On no account should cruciferous plants occupy the diseased quarters the next season.

BLACK ROT (or BLACK SPOT) OF TOMATO (*Macrosporium Tomato*). A very common and well-marked fungoid disease, found upon Tomatoes, whether grown under glass or outside. It is more troublesome in the former case than in the latter. As the common name suggests, the chief characteristic is a dark spot, which, as the disease progresses, sinks. Usually the spots appear on the blossom end of the fruit, but they are not confined thereto, or even to the fruit itself, the foliage and stems of the plant being sometimes involved. The fungus gains access to the fruit by means of a rupture in the skin, and spreads very rapidly, and eventually the tissues rot, through the penetration of the dark mycelium. The gardener is generally made aware of the presence of the fungus when the fruits are about one-third grown.

In the case of plants under glass, the chief predisposing causes are too much atmospheric moisture and insufficient ventilation, combined with the use of fresh manure. Directly the disease is noted, all affected fruit (or, in bad cases, plants as well) should be burned, or the trouble will be increased a hundred-fold. The other plants should then be sprayed with sulphide of potassium (1oz. to 3gall. of water) every ten or twelve days for a time. This will prevent it from spreading. Tomato-growers would, however, find it much more profitable to spray early in the season as a preventive measure. Fruits which colour prematurely should especially be regarded with suspicion, as such are frequently affected.

BLACK ROT OF VINES (*Læstadia Bidwellii*). Though frequently found in this country as well as in France, this disease is most prevalent in America, where it constitutes the worst of all Grape foes. The common name is in allusion to the appearance presented by the affected berries. Twigs and foliage are also attacked. Viala, whose investigations in connection with this disease are amongst the most noteworthy, suggests that something by way of prevention might be done by employing stocks which are practically proof against the disease. A similar view is held by Rathay.

The disease is usually first observed on the leaves, for though the young shoots may be also affected, the gardener is more likely to have foliage and fruit under observation.

Black Rot of Vines—*continued.*

The foliage has reddish-brown spots with darker margins, and later the surface is covered with black pustules (pimples). These are pycnidia. By this time the berries are also involved. The first appearance of the disease upon these shows itself, according to Prof. F. D. Chester, "as a light brown spot, caused by the decay of the underlying pulp, this spot increasing in size so as to involve the entire berry. Simultaneous with this change the parts first affected turn black, and become covered with minute black pustules. Finally, the entire berry dries and shrivels, the skin crumpling into angular folds. The entire berry is now uniformly covered with the pustules." When mature, the pycnidia yield stylospores which, if they find a suitable resting-place, germinate, and still further increase the trouble. The disease is probably tided over the winter in ascospores, which remain dormant until the spring of the following year.

The importance of removing and burning all leaves, shoots, and fruits showing the disease, as well as those which have fallen, will at once be apparent.

To check the disease when once it appears, spraying with the ammoniacal solution of copper carbonate (*see* **Fungicides**) is best. This may be employed, if properly made, without injury to either foliage or fruit at intervals of a fortnight. The next season Bordeaux Mixture may be sprayed on before the leaves expand. Certain conditions of Vines and borders predispose to attack in this as in many other fungoid diseases, and the cultivator must be particularly on his guard against the too liberal use of strong manures.

BLACKS. *See* **Athalia spinarum.**

BLACK SALTWORT. *See* **Glaux maritima.**

BLACK SLUG. *See* **Athalia spinarum.**

BLACK SPOT OF TOMATO. *See* **Black Rot of Tomato.**

BLACK-VEINED WHITE BUTTERFLY. *See* **Pear Insects.**

BLADDER CAMPION. *See* **Silene inflata.**

BLADDER or POCKET PLUMS. This condition of Plums is due to the presence of a peculiar fungus (*Exoascus pruni*), allied to the destructive Leaf-Curl of Peaches, &c. It is a most insidious disease, and one which materially injures the fruit crop. The gardener is not aware of its presence until the young fruits are developing in May, when, instead of being firm and healthy-looking, and of the normal form, they are distorted, elongated, sometimes wrinkled hollow masses of a yellowish colour. In late summer, these Bladder or Pocket Plums are covered with a glaucous bloom, and finally become rotten, though, perhaps, persistent. This powder consists of asci, or bags, which contain spores ready to be distributed at the proper time. Fruits so affected contain no stones. The area of infection is rapidly spread by means of these spores; and, therefore, the aim of the cultivator must be directed to removing such useless fruits before the spores can be liberated. This will not in itself be sufficient, as the mycelium of the fungus is also present in the branches; hence, therefore, a pruning back of the shoots to the old wood is absolutely necessary, or year by year the trouble will increase, until the trees are rendered quite useless. Where the disease has been known to exist in a garden, or even in a certain neighbourhood, it will be wise to spray in early spring with Bordeaux Mixture, as a precautionary measure.

On the Continent, as well as in America and in this country, the disease is alike very common. For years its cause was ascribed to anything but fungus. At one time the deformed Plums were thought to be due to a gall-making insect as well as to improper fertilisation. Even at the present time the exact method by which healthy trees are infected is not known.

BLADDER RUST, or WEYMOUTH PINE RUST (*Peridermium Strobi*). This is one of the *Uredineæ*, or Rusts, and one, moreover, requiring two host-plants to complete its life-cycle—the Weymouth Pine (*Pinus Strobus*), or an ally like *P. Cembra*, and the Black Currant or other *Ribes*. At one time the latter stage was known to science as *Cronartium ribicolum*. So far the disease has not asserted itself sufficiently in England to cause undue alarm, yet it has been more than once recorded, notably by Dr. Plowright, of King's Lynn, who has done so much towards working out the life-histories of these complex heterœcious fungi. In Germany the disease is commonly met with.

So far as the Pines are concerned, the disease is confined to the twigs and branches on which bladder-like growths of a variable yellow colour appear; these yield spores which need only to come in contact with the leaves of some species of *Ribes* (like the Black Currant, already alluded to) in order to carry on the cycle. On these it forms a yellowish-red Rust yielding uredospores, and later a crop of teleutospores. The disease is of a debilitating nature, particularly to the Pines, whose affected branches die away and the needles are shed. Planters of the Weymouth Pine should exercise the greatest care when introducing new stock, especially that from abroad; and, when suspected, on no account should the two host-plants be kept in proximity—the latter a somewhat difficult matter in the aggregate, as they may be in neighbouring gardens, and thus the disease may be disseminated, as it were, unwittingly.

BLADDER SEED. *See* **Physospermum.**

BLADHIA. A synonym of **Ardisia** (which *see*).

BLAKEA. SYN. *Valdesia*. About sixteen species, natives of Colombia, Venezuela, Peru, and the West Indies, are referred to this genus; but only two have been introduced.

BLANCHING. *See* **Chlorosis.**

BLANCOA (of Blume). A synonym of **Didymosperma** (which *see*).

BLANDFORDIA. According to Bentham and Mueller ("Flora Australiensis"), there are only four distinct species of this genus, all Australian. To the information given on p. 193, Vol. I., the following should be added:

B. aurea is a variety of *B. flammea*.

B. cordata (heart-shaped). A synonym of *Galax aphylla*.

B. Cunninghami is synonymous with *B. grandiflora*.

B. intermedia is synonymous with *B. grandiflora*.

B. nobilis imperialis (imperial). *fl.* bright orange-red, margined with golden-yellow, campanulate, very large. 1890. A fine variety.

BLANKET LEAF. *See* **Verbascum Thapsus.**

BLASTEMANTHUS GEMMIFLORUS. The correct name of *Godoya gemmiflora*.

BLECHNIDIUM and BLECHNOPSIS. Included under **Blechnum** (which *see*).

BLECHNUM. Including *Blechnidium*, *Blechnopsis*, and *Salpichlæna*. This genus comprises about a score species of closely-related Ferns, widely diffused throughout tropical and South temperate regions.

The genus *Blechnum* is composed of mostly handsome-growing plants, of strong habit, very useful for decorative purposes, although there are also included in it several dwarf kinds that are particularly adapted for growing in Fern-cases or in shallow crevices in the rockery.

The pretty little evergreen, *B. Lanceola*, is one of those particularly adapted for planting in Fern-cases, where it thrives admirably, and where the contrast between the bright dark green of the upper surface of its fronds and the continuous central band of deep brown formed by the sori is very conspicuous and attractive.

Blechnum—*continued.*

Like the Lomarias, to which they are closely allied, but from which they differ in not producing separate fertile fronds, the Blechnums are mostly hardy and of rapid growth. They have a particular dislike to water over the fronds, which causes them to turn first brown and then black in a very short time, unless the plants are in a very light, warm, and well-ventilated place, which, to a certain extent, counterbalances the effects of the superfluous moisture by not allowing it to remain on the foliage long enough to injure it. Blechnums will thrive in almost any compost, but their fronds become stouter, and have more consistency, when grown in a mixture of two parts peat, one part loam, and one part sand, with good drainage, taking care that the roots never suffer from want of water. Propagation is usually effected by means of the spores, which are produced in abundance, and which germinate very freely when sown in heat.

FIG. 175. BLECHNUM OCCIDENTALE.

B. occidentale (Fig. 175), a stove species, is one of the best-known and most-appreciated among Ferns of dwarf habit, probably on account of its easy cultivation and the lasting qualities of its elegant fronds, which remain fresh a very long time in water, when used for mixing with cut flowers. Besides, it has for years been used in many establishments for growing amongst orchids, to which it forms a very effective background or undergrowth, the more so that it is a plant never infested by pests of any sort, and that it grows as well in coarse sand, gravel, or moss as in the best compost. To those described on pp. 193-5, Vol. I., the following should be added:

B. corcovadense (Corcova). A variety of *B. brasiliense*.

B. Gilliesii (Gillies'). A synonym of *Lomaria procera*.

B. glandulosum (glandular). A synonym of *B. occidentale*.

B. gracile (slender). A synonym of *B. longifolium*.

B. latifolium (broad-fronded). A synonym of *B. longifolium*.

B. longifolium (long-fronded). This variable stove plant is very well shown at Fig. 176.

B. melanopus (dark-footed). *sti.* dark chestnut-brown. *fronds* lanceolate, 8in. to 9in. long, 2in. to 3in. broad; pinnæ numerous, narrow-falcate, coriaceous, 1½in. long, ¼in. broad, gradually narrowed towards the apex and enlarged at the base, the lowest becoming gradually shorter and more obtuse. *sori* disposed in a

Blechnum—*continued.*

FIG. 176. BLECHNUM LONGIFOLIUM.

continuous line near the midrib. Khasia Hills. Greenhouse. SYN. *Blechnidium melanopus.*

B. nitidum. This useful stove Fern is well shown at Fig. 177.

FIG. 177. BLECHNUM NITIDUM.

B. punctulatum (slightly dotted). A synonym of *Lomaria punctulata.*

B. rugosum (wrinkled). *sti.* 3in. to 6in. long, densely glandular-hairy above, as is the rachis. *fronds* linear-lanceolate, acuminate, about 1ft. long, the surface wrinkled, glandular-hairy; pinnæ with a stalk-like base below, confluent above, oblong, blunt or sometimes abruptly acute, falcately curved. *sori* linear, medial, extending from the base nearly to the apex of the pinnæ. 1884. Greenhouse.

B. Spicant (spiked). A synonym of *Lomaria Spicant.*

B. triangulare (triangular). A synonym of *B. unilaterale.*

Blechnum—*continued.*

B. volubile (twining). *sti.* climbing. *fronds* bipinnate; pinnæ disposed in distant, opposite pairs; pinnules coriaceous, usually four to six on each side, stalked, narrow-lanceolate, 6in. to 12in. long, ½in. to 2in. broad, with an undulated, cartilaginous border. *involucre* broad, membranous, at first wrapped over the fruit, afterwards breaking up into short pieces. Tropical America Stove.

BLECHUM. About four species, natives of the West Indies, Central America, Colombia, and the Philippines, are included in this genus. Flowers rather small, solitary or densely spicate; calyx segments linear-subulate; corolla tube often shortly exserted, the limb spreading, with five rounded, twisted lobes; stamens four, didynamous. Leaves entire or repand-toothed.

BLEEDING. This is most frequently met with in connection with Grape Vines. It is chiefly caused by late pruning, or by an excess of vigour, oftener, however, by the former. To prevent it, pruning should be done as soon as possible after the foliage has fallen, and the Vines given a rest by keeping them as cool as possible for a few weeks. Other plants will also Bleed through pruning at unseasonable times. In the case of ornamental trees it is advisable to cover the wound with coal-tar or grafting-wax.

Another form of sap extravasation takes the form of small, transparent globules on the young growing shoots of Vines. It is not injurious to the health of the plants. It might possibly be injurious if the plant could not thus find an outlet for the excess of sap.

BLEEKERIA. A synonym of **Ochrosia** (which *see*).

BLENNOCAMPA PUSILLA. *See* **Rose Sawflies.**

BLEPHARIS. Including *Acanthodium.* About a score species, natives of tropical and South Africa and the East Indies, are included in this genus. Leaves opposite, membranous or rigid.

BLETIA. SYNS. *Gyas, Thiebautia.* Including *Bletilla.* About a score species have been referred to this genus; they are mostly natives of tropical America, with one Chinese and Japanese. To those described on p. 196, Vol. I., the following should be added. *See also* **Arundina, Brassavola,** and **Calanthe,** for a few species formerly classed hereunder.

B. Godseffiana (Godseff's). This is probably a variety of *B. verecunda,* from which it appears to differ only in having smaller flowers. Brazil (?), 1893.

B. graminifolium (Grass-leaved). A synonym of *Arundina bambusæfolia.*

B. hyacinthina albo-striata (white-striated). A pretty variety, having all the nerves of the leaves white. It will thrive in the cool house. Flowers of the typical plant are shown in Fig. 178.

B. pallida (pale). A synonym of *B. florida.*

B. reflexa (reflexed). *fl.* purple, 1¼in. long, having the lip veined with brown and the keels white. *l.* Grass-like, ¼in. broad. *h.* 1ft. Mexico, 1895.

B. Tankervilliæ (Mrs. Tankerville's). A synonym of *Phaius grandifolius.*

B. Thomsoniana (Thomson's). A synonym of *Schomburgkia Thomsoniana.*

B. Watsoniana (Watson's). *fl.* about 2in. across, borne at the apex of a tall, slender spike; sepals and petals magenta; lip three-lobed, varying from bluish-purple to magenta, with a central white band and a golden disk. Pseudo-bulbs flattish, ridged, broad. 1894. A distinct species.

B. Woodfordii (Woodford's). A synonym of *Phaius maculatus.*

BLETILLA. Included under **Bletia** (which *see*).

BLIGHT. *See* **Apple and Pear Blight.**

BLISTER RUST. *See* **Pine Bark Blister Rust.**

BLITUM. Included under **Chenopodium** (which *see*).

BLOOD is a manure usually rich in ammonia. It is beneficial in the form of a powder as a top-dressing for plants requiring a stimulant to give size and colour to the flowers. In a crude state it cannot be recommended for general use. Much injury has been done to Vines and fruit trees by heavy applications of fresh blood. *See* **Animal Manures.**

BLOODBERRY. *See* **Rivina humilis.**

BLOODWORT. *See* **Sanguinaria canadensis.**

FIG. 178. BLETIA HYACINTHINA.

BLOOMERIA (named in honour of Mr. H. G. Bloomer, Botanical Curator of the Californian Academy of Sciences). ORD. *Liliaceæ*. A small genus (two species) of fine, half-hardy, bulbous plants, natives of California. They differ from *Brevoortia*, *Stropholirion*, and allied genera, in having the perianth segments free to the base, as in **Allium** (which *see* for culture).

B. aurea (golden). *fl.* golden-yellow, disposed in a spreading, many-flowered umbel; perianth rotate, 1in. in diameter, the segments linear-oblong; scape slender, about 1ft. long. July. *l.* solitary, 1ft. long, very narrow-linear. Bulb as large as a Hazel-nut. California, 1869. (G. C. 1896, xx., p. 687, f. 119.) SYN. *Nothoscordum aureum* (B. M. 5896).

B. Clevelandi (Cleveland's). This resembles *B. aurea*, but the flowers are smaller, the stamens are shorter in proportion to the perianth, and the scape is slenderer. 1896. (G. C. 1896, xx., p. 687, f. 120.)

BLUEBELL, NEW ZEALAND. *See* **Wahlenbergia saxicola.**

BLUEBERRY. *See* **Vaccinium Myrtillus.**

BLUE BONNETS. *See* **Scabiosa succisa.**

BLUE BUTTONS. *See* **Scabiosa succisa.**

BLUE COWSLIP. *See* **Pulmonaria angustifolia.**

BLUE CURLS. *See* **Trichostema.**

BLUE-EYED GRASS. *See* **Sisyrinchium.**

BLUE JACK. *See* **Quercus cinerea.**

BLUE PALMETTO. *See* **Rhapidophyllum Hystrix.**

BLUE VERVAIN. *See* **Verbena hastata.**

BLUMENBACHIA. About a dozen species, all American, are included in this genus. To those described on pp. 196-7, Vol. I., the following should be added:

B. lateritia (brick-red). The correct name of *Loasa lateritia* (B. M. 3632; B. R. 1838, 22).

B. multifida (much-cleft). *fl.* white, with a red and yellow centre, bibracteate; petals hispid. July. *l.* palmately lobed and bipinnatifid. Otherwise resembling *B. insignis*. Buenos Ayres, 1826. (B. M. 3599.)

BLUMENBACHIA (of Koeler). A synonym of **Sorghum** (which *see*).

BLUMIA. A synonym of **Sarauja** (which *see*).

BLUSH ROSE. *See* **Rosa indica.**

BOAT-LIP ORCHID. *See* **Scaphyglottis.**

BOBARTIA. According to J. G. Baker, this genus comprises eight species, natives of Cape Colony. Flowers pale yellow, fugitive, more than one in a spathe; perianth-tube none or very short, the segments spreading; stamens inverted at the base of the perianth; clusters fascicled, rarely single, usually overtopped by a single bract. Leaves rigid, terete or ensiform.

BOCCONIA. This genus consists of about five species, natives of tropical America and China. To those described on p. 197, Vol. I., the following should be added:

B. microcarpa (small-fruited). *fl.* of a warm bronzy tint, disposed in a plume-like panicle, not unlike the Venetian Sumach in the early summer. *l.* much as in *B. cordata*. *h.* 9ft. Northern China, 1896. (R. H. 1898, p. 362, f. 125.)

BŒA. *See* **Bæa.**

BŒBERA is a synonym of **Dysodia** (which *see*).

BŒHMERIA. SYNS. *Duretia*, *Splitgerbera*. This genus embraces about forty-five species, broadly dispersed, mostly tropical. To that described on p. 197, Vol. I., the following variety should be added:

B. nivea candicans (whitish). *l.* the same colour on both sides, or the young ones at first whitish beneath. SYN. *B. tenacissima*.

B. tenacissima (very tenacious). A synonym of *B. nivea candicans*.

BŒNNINGHAUSENIA (named in honour of C. F. von Bœnninghausen). ORD. *Rutaceæ*. A monotypic genus. The species (*B. albiflora*) will be found described on p. 337, Vol. III., under its old name, **Ruta albiflora.**

BOG MOSS. *See* **Sphagnum.**

BOG RHUBARB. *See* **Petasites vulgaris.**

BOG VIOLET. *See* **Pinguicula vulgaris.**

BOILERS. *See* **Heating.**

BOLBITIS. Included under **Acrostichum** (which *see*).

BOLDEA. A synonym of **Peumus** (which *see*).

BOLDOA (named after Baltasar Manuel Boldo, a Spanish botanist, who collected in Cuba at the end of the eighteenth century). SYN. *Salpianthus*. ORD. *Nyctagineæ*. A small genus (two species) of stove, tuberous herbs, natives of Mexico, one being also found in Cuba. Flowers small, in cymose heads or racemes. Leaves alternate, petiolate, deltoid- or trapezoid-ovate, obtuse, entire. *B. lanceolata* has been introduced, but is not of much horticultural value.

BOLE. The body of a tree.

BOLIVARIA. A synonym of **Menodora** (which *see*).

BOLLEA PULVINARIS. This does not appear to differ from **Zygopetalum cœleste** (which *see*).

BOLTONIA. There are about a dozen species of this genus, natives of North America and North and sub-tropical Asia. Flower-heads heterogamous, paniculate or solitary; involucre hemispherical, the bracts in few series;

Boltonia—*continued.*

receptacle convex or conical. Leaves alternate, entire or deeply toothed. To the species described on pp. 198-9, Vol. I., the following should be added:

B. diffusa (diffuse). The correct name of *B. asteroides* (of B. M.).

B. latisquama (broad-scaled). *fl.-heads* bluish-violet; involucral scales spathulate or obovate, mucronate or cuspidate. Autumn. *l.* linear-lanceolate. *h.* 3ft. to 5ft. North America, 1879.

BOLTS. *See* **Trollius europæus.**

BOMAREA. SYNS. *Danbya, Vandesia.* Including *Collania* (of Herbert). According to J. G. Baker, this genus embraces about seventy-five species, natives of Mexico and South America. In *Alströmeria* the three inner segments are unequal, while in *Bomarea* they are equal. To the species, &c., described on p. 200, Vol. I., the following should be added:

B. acutiflora. This differs from *B. edulis* in its short, simple or at most two-flowered peduncles, and more brightly-coloured (yellow) inner perianth segments. (B. M. 3050, 3871; S. B. F. G. ser. ii. 77.)

B. andimarcana (high Andes). *fl.*, perianth 1½in. to 2in. long; segments equal, the outer ones much tinged with red, the inner ones yellowish-green. *l.* crowded, sessile, erecto-patent, 3in. to 5in. long. Stems much decurved at top. High Andes of Peru, 1846. SYN. *Collania andimarcana* (B. M. 4247).

B. Bredemeyeriana (Bredemeyer's). A synonym of *B. multiflora.*

B. Caldasiana. SYN. *Alströmeria Caldasii* (B. M. 5442).

B. chontalensis is a variety of *B. edulis.*

B. densiflora (dense-flowered). A synonym of *B. tomentosa.*

B. edulis. SYNS. *Alströmeria edulis* (A. B. R. 649), *A. Salsilla* of Gawler (B. M. 1613). *B. chontalensis* is a variety of this species.

B. e. ovata (ovate). *fl.* larger than in the type. *l.* broader, more rounded at the base, pubescent beneath. SYN. *Alströmeria ovata* (B. M. 2846).

B. Jacquesiana (Jacques'). *fl.*, perianth segments equal, 1½in. to 2in. long, the outer ones bright pink, spotted towards the edge, oblong-spathulate, the inner ones greenish-white, spotted all over the blade, unguiculate in the lower half; umbel drooping six- to twelve-rayed. *l.* petiolate, oblong, acute, 4in. to 6in. long, 2in. broad. Stems elongated, sarmentose, dark brown. Brazil, 1875. SYN. *Alströmeria Jacquesiana* (F. d. S. 182).

B. Kalbreyeri (Kalbreyer's). *fl.* pedicellate, in large, terminal umbels, the three outer segments brick-red, about 1in. long, oblong-spathulate, the three inner ones orange-yellow, spotted red, longer than the outer ones, obovate-cuneate. *l.* shortly stalked, oblong, acuminate, glabrous above, downy beneath. Colombia, 1883. (R. H. 1883, p. 516.)

B. multiflora (many-flowered). *fl.* twenty to forty in a dense umbel; perianth segments nearly equal, the outer ones tinged with red, oblanceolate, 1in. long, the inner ones reddish-yellow, copiously spotted with claret-brown. September. *l.* lax, petiolate, oblong, acute, 3in. to 4in. long. Stems sarmentose, finely pubescent. Venezuela and Colombia, 1829. SYN. *B. Bredemeyeriana* (F. d. S. 2316).

B. patacoensis (B. M. 6692) is the correct name of *B. patococensis.*

B. rosea (pink). *fl.* few or many in a usually simple umbel; perianth segments equal, about 1in. long, the outer ones pale red, tipped with green, oblanceolate, the inner ones greenish-yellow, spotted, obovate-unguiculate. *l.* lax, petiolate, oblong-acute, 3in. to 4in. long, thin, glaucous and pubescent beneath. Stems elongated, sarmentose. Andes of Peru, &c. SYN. *B. simplex* (B. M. 3863).

B. Salsilla. SYN. *Alströmeria oculata* (B. M. 3341; L. B. C. 1851). The *B. Salsilla* of Gawler is identical with *B. edulis.*

B. simplex (simple). A synonym of *B. rosea.*

B. sororia (sisterly). *fl.* about twenty in a loose umbel; outer segments of the perianth rosy, spotted with carmine, a little shorter than the inner ones, which are green, spotted with brown. *l.* ovate, acuminate, pubescent beneath. South America, 1892. This resembles *B. edulis.* (I. H. n. s. t. 145.)

B. tomentosa (downy). The correct name of *Alströmeria densiflora.* SYN. *B. densiflora.*

B. vitellina (egg-yolk-colour). *fl.* of a rich, deep orange-yellow, narrowly-campanulate, 2in. long, numerously disposed in large, drooping, umbellate cymes; outer and inner perianth segments unequal in length. *l.* ovate-oblong, acute. Stems smooth. Colombia, 1882. A very beautiful, tuberous-rooted climber, adapted for conservatory decoration. (G. C. n. s., xvii., p. 143.)

B. Williamsiæ (Mrs. Rosa Williams') is the correct name of *B. Williamsii.*

BOMBARRA GROUND NUT. *See* **Voandzeia subterranea.**

BOMBAX. This genus embraces ten species, natives of tropical Asia, Africa, and America.

B. Gossypium (Gossypium). A synonym of *Cochlioperma Gossypium.*

BOMBUS LUCORUM. *See* **Humble Bee.**

BOMBUS TERRESTRIS. *See* **Humble Bee.**

BOMBYCINA. *See* **Moths.**

BONAPARTEA (of Ruiz and Pavon). Included under **Tillandsia** (which *see*).

BONAPARTEA (of Willdenow). Included under **Agave** (which *see*).

BONAVERIA. A synonym of **Securigera** (which *see*).

BONELLIA. A synonym of **Jacquinia** (which *see*).

BONES. Bone-meal is valuable for all crops in which lime is a prominent constituent, as, for instance, the Vine, all stone fruits, Apples, Pears, and most vegetable crops. It is also beneficial if mixed at the rate of 2lb. of Bone-meal to one barrow-load of compost for Strawberries in pots, Chrysanthemums, and many other plants. What are termed 1in. and ½in. Bones are only suitable for fruit-tree borders, as they are slow in action. *See* **Animal Manures.**

BONJEANIA. Included under **Dorycnium** (which *see*).

BONNETIA. SYN. *Kiesera.* Five species, all South American, are referred to this genus.

BONNETIA (of Schreber). A synonym of **Mahurea** (which *see*).

BONNINGHAUSIA. A synonym of **Chætocalyx** (which *see*).

BONPLANDIA (named in honour of Aimé Bonpland, a French naturalist). SYN. *Caldasia.* ORD. *Polemoniaceæ.* A monotypic genus. The species, *B. geminiflora* (B. R. 92, under name of *Caldasia heterophylla*), is a glandular-pilose, stove herb or under-shrub, native of Mexico, with violet flowers and undivided leaves. It is probably not now in cultivation.

BONTIA (of Linnæus). A synonym of **Avicennia** (which *see*).

BOOPHANE, or BOOPHONE. *See* **Buphane.**

BOOPIDEÆ. Included under **Calycereæ** (which *see*).

BOPUSIA. A synonym of **Graderia** (which *see*).

BORAGO. SYN. *Borrago.* About half-a-dozen species, natives of the Mediterranean region (one being also found elsewhere), are comprised in this genus. To those described on p. 201, Vol. I., the following synonyms should be added:

B. orientalis (Oriental). A synonym of *Trachystemon orientalis.*

B. zeylanica (Cingalese). A synonym of *Trichodesmia zeylanicum.*

BORASSUS. SYN. *Lontanus.* According to Bentham and Hooker, this genus is monotypic, *B. æthiopicum* being regarded as synonymous with *B. flabellifer* (also known as *B. flabelliformis*).

BORDEAUX MIXTURE, or BOUILLIE BORDELAISE. This is by far the most effective fungicide introduced. As the name above adopted denotes, it had its origin in the City of Bordeaux, having been discovered by Millardet, in 1885. On the Continent, and also in America, it has been extensively and successfully employed by fruit-growers to battle with many of the most insidious diseases to which the softer fruits, such as Grapes, are liable. In this country, so far, its merits

Bordeaux Mixture—*continued.*

have not been so widely appreciated as they deserve, considering its effectiveness, ease of application, and cheapness. The preparation consists of a solution of copper sulphate and quicklime, with occasionally, to increase the adhesiveness, molasses or soft soap. Several strengths have been advocated to suit different plants and the foliage or fruit at various stages. In the young and tender stage of either foliage or fruit the solution should be weaker than when either is more advanced. On account, however, of the disfiguring effect it has upon fruits required for either market or the table, the fungicide should not be employed, say, within a month or six weeks of the time of its being required. In the case of ornamental plants it is better to use one of the clear fungicides, simply on account of the effect produced. *See* **Fungicides.**

For general purposes, the best formula is: Copper sulphate, 6lb.; unslacked lime, 4lb.; water, 50gall. Almost equally good results have been obtained by further reducing the copper sulphate to 4lb. Professor Galloway, of the United States Department of Agriculture, gives simple but very minute directions for the preparation of Bordeaux Mixture as follows: In a barrel place 25gall. of water. Weigh out 6lb. of copper sulphate, then tie the same in a piece of coarse sacking, and suspend it just beneath the surface of the water. By tying the bag to a stick, laid across the barrel, no further attention need be given In another vessel slack 4lb. of lime, taking care to form a paste free from grits or lumps; this is best done by placing the lime in an ordinary water-pail, and adding at first, say, from 1 quart to 3 pints. When the lime begins to crack and crumble, and the water to disappear, another quart or more of water should be added, taking care that at no time the lime gets too dry. Towards last a considerable quantity of water will be required; but if added slowly by degrees, a perfectly smooth paste will result, if the lime used be of good quality. When the lime is slacked, add sufficient water to bring the whole up to 25gall. When the copper sulphate is entirely dissolved and the lime cool, the lime-milk and copper sulphate solution should be poured slowly together into a barrel holding 50gall., first thoroughly mixing the lime-milk. A final stirring for a few minutes with a broad wooden paddle completes the process.

To determine whether the preparation is safe to apply to tender foliage, Professor Galloway recommends the following test: Insert the blade of a penknife in the mixture, allowing it to remain for at least one minute. If the polished steel assumes the colour of copper-plate, the mixture is unsafe, and more lime must be added. If, however, the blade remains unchanged, the mixture has been correctly prepared.

If the Bordeaux Mixture cannot all be used after preparation, extra care will be necessary on its employment subsequently to see that it is well stirred. After a time the useful constituents are precipitated, leaving a clear liquid of no value as a fungicide. Paris Green is sometimes added to the Bordeaux Mixture with a view to combining an insecticide with a fungicide.

BORKHAUSENIA. A synonym of **Teedia** (which *see*).

BORONIA. Including *Cyanothamnus.* Australia is the home of this genus, which embraces about fifty species. Only one species and its variety call for addition to those described on p. 203, Vol. I.

B. Fraseri (Fraser's). (B. M. 4042.) The correct name of *B. anemonifolia* of P. M. B

B. heterophylla (variable-leaved). *fl.* pink; sepals very short; petals about ¼in. long, imbricated; peduncles axillary, one-flowered, thickened under the flower. April. *l.* either simple and linear, 1in. to 2in. long, or pinnate, with three to five

Boronia—*continued.*

linear leaflets on an elongated, common petiole. Branches slender, numerous. 1837. A tall, glabrous shrub.

B. h. brevipes (short-stalked). *fl.* bright scarlet, whorled at the leaf axils, usually in fours or sixes, drooping, sub-globose; petals concave, sub-acute. 1881. (B. M. 6845.)

B. pulchella (rather pretty). The correct name of *B. Drummondii.*

B. tetrandra is synonymous with *B. pulchella.* (L. & P. F. G. i. 35, t. 5.)

BORRAGINOIDES. A synonym of **Trichodesma** (which *see*).

BORRAGO. A synonym of **Borago** (which *see*).

BORRICHIA (named in honour of Olaf Borrich, of Copenhagen, who wrote on medicinal plants at the end of the seventeenth century). SYNS. *Adelmannia, Diomedea.* ORD. *Compositæ.* A small genus (three to five species) of greenhouse, evergreen shrubs, natives of the West Indies and the neighbouring coast of North America. Flower-heads yellow, heterogamous, radiate. Leaves opposite, entire, rather thick. Three species have been introduced (under the name *Diomedea*), but it is doubtful if either of them is still in cultivation.

BOSSCHERIA. Included under **Ficus** (which *see.*)

BOSSIÆA. Including *Lalage.* Thirty-four species are referred here by Bentham in the "Flora Australiensis." To the species described on pp. 203-4, Vol. I., the following should be added. *See also* **Scottea.**

B. dentata (toothed). The correct name of *Scottea dentata.*

B. disticha (two-ranked). *fl.* solitary or two together; standard twice as long as the calyx. May. *l.* distichous, ovate or oblong; very obtuse but often minutely mucronate, ¼in. to ⅜in. long, sprinkled with appressed hairs. *h.* 2ft. 1840. (B. R. 1841, t. 55.)

B. heterophylla (variable-leaved). *fl.*, standard very broad and twice as long as the calyx; pedicels shorter than the leaves. September. *l.* distichous, often distant, ⅜in. to 1in. long, the lower ones ovate or nearly orbicular, the upper ones becoming gradually narrower. Branches erect or ascending. *h.* 1ft. to 2ft. 1792. (L. B. C. 271.) SYNS. *B. lanceolata* (B. M. 1144), *Platylobium lanceolatum* (A. B. R. 205), *P. ovatum* (A. B. R. 266).

B. lanceolata (lanceolate). A synonym of *B. heterophylla.*

B. ornata (ornamental). *fl.* usually two or three together; standard often ⅜in. in diameter. April. *l.* broadly ovate (almost cordate) to narrow-lanceolate, ⅜in. to 2in. long, flat, loosely pubescent beneath. *h.* 1ft. to 2ft. 1830. SYN. *Lalage ornata* (B. 141; B. R. 1722).

B. o. hoveæfolia (Hovea-leaved). *l.* oblong-lanceolate, with somewhat recurved margins. 1841. SYN. *Lalage hoveæfolia* (P. M B ix., p. 171).

B. paucifolia (few-leaved). A synonym of *B. rufa foliosa.*

B. prostrata (prostrate). The correct name of *B. linnæoides.* (B. M. 1493.)

B. rotundifolia is probably a luxuriant variety of *B. rhombifolia.*

B. rufa (rufous). *fl.* solitary or clustered, proceeding from leafless nodes; standard broad, more than twice as long as the calyx. August. *l.* (when present) obovate or oblong, ¼in. to ⅜in. long, very obtuse. Branches flattened, sometimes spiny, bordered by narrow wings, which disappear in leafy specimens. *h.* 6ft 1803. (L. B C. 1119.)

B. r. foliosa. The correct name of *B. foliosa.* SYN. *B. paucifolia* (B. R. 1843, t. 63).

B. r. virgata (twiggy). Branches elongated, more or less leafy, not spiny 1841. SYN. *B. virgata* (B. M. 3896).

B. rufa (of Maund). A synonym of *B. ensata.*

B. virgata (twiggy). A form of *B. rufa.*

BOSTRYCHUS DISPAR. *See* **Apple-Bark Beetle.**

BOSTRYCHUS DOMESTICUS. *See* **Scolytidæ.**

BOSWELLIA. SYNS. *Libanus, Plœsllia.* There are three or four species of this genus, natives of Africa and Central India. To those described on p. 204, Vol. I., the following should be added:

B. Carterii (Carter's). *fl.* whitish, in simple, axillary racemes. *l.* imparipinnate; leaflets opposite, eight to ten on each side, ovate, 1¼in. long, undulated, glabrous or pubescent. *h.* 12ft. to 20ft. Arabia, &c.

B. glabra is regarded by Hooker as a variety of *B. serrata.*

BOTANY may be described as the Science which treats of Plants: their structure, functions of their parts, qualities, uses, nomenclature, and geographical distribution. Accordingly it is divided into Structural, Physiological, and Systematic. From a very early date Botany has been studied, but it was not until the time of Theophrastus (B.C. 324) and Pliny that any serious consideration was given to the subject. The Science progressed but slowly, notwithstanding the introduction of the microscope, until Ray, in 1686, issued his "Systema Plantarum." To Linnæus, however, belongs the greatest credit, for his "Systema Naturæ," in which the Artificial System of Botany was propounded. Later he, in part, worked out a natural one, which was modified by Jussieu, and afterwards by De Candolle, Lindley, and Bentham and Hooker, whose monumental labours are embodied in the "Genera Plantarum" of the present day.

BOTHERBE. A synonym of **Calydorea** (which *see*).

BOTHRIOCHILUS. A synonym of **Cœlia** (which *see*).

BOTRYADENIA. A synonym of **Myriactis** (which *see*).

BOTRYANTHUS. Included under **Muscari** (which *see*).

BOTRYCERAS (from *botrys*, a bunch, and *keras*, a horn; in reference to the incurved, pectinate branches of the female inflorescence). SYNS. *Daphnitis*, *Laurophyllus*. ORD. *Anacardiaceæ*. A monotypic genus. The species, *B. laurinum*, is a greenhouse, evergreen tree or shrub, native of South Africa. It has been introduced, but is probably not now in cultivation.

BOTRYCHIUM contains some very curious plants, all deciduous; but they are seldom seen in cultivation, probably on account of the difficulties experienced in keeping them through the winter, when they should not on any account be allowed to get dry, or death will speedily and assuredly ensue. They are of little use as pot-plants, but their fertile fronds have a very pleasing appearance among other Ferns when grown in the rockery, in which case they should be planted in some naturally damp nook where they are not likely to be disturbed, and where constant moisture may be secured for them while at rest. The difficulty in taking them up consists in getting the crowns with their roots, as they are generally found to be deeply imbedded in the ground.

To induce Botrychiums to grow in a Fernery, they should be moved with about a square foot of the turf in which they are growing naturally, and as much of depth of the soil undisturbed. They like to have their roots covered with turf, though they should not be overshadowed by other vegetation. The plants succeed best in a compost of sandy loam and only a small portion of peat, and perfect drainage is essential. Propagation may be effected by division of the crowns. There is no record of seedlings having been raised artificially.

B. lanuginosum (woolly). A variety of *B. virginianum*.

B. virginianum lanuginosum (woolly). *sterile segments* slightly hairy. *fertile peduncle* rising from the centre of the barren frond, which the panicle scarcely overtops.

BOTRYODENDRON. A synonym of **Meryta** (which *see*).

BOTRYOID. Bunch-like; having the form of a bunch of Grapes.

BOTRYTIS. Under this generic heading were at one time grouped a number of very destructive fungi whose spores are produced in clusters resembling miniature bunches of Grapes. Present-day plant pathologists now regard it as but a form-genus—one phase, in fact, in the life-history of the plants. Some of the most familiar of these *Botrytis* fungi are: the species of *Sclerotinia*, giving rise to the very destructive Lily disease—*B. cinerea*, a form of the much-dreaded *Sclerotinia fuckeliana* of the Vine, &c.; *B. pæoniæ*, a form of *S. pæoniæ*, responsible for the disease of Pæonies,

Botrytis—*continued.*

characterised by a sudden collapse of the stems and the presence of a greyish-white mould; *B. galanthina*, a form of *S. galanthina*, which attacks Snowdrops; *B. Douglasii*, a form of *S. Douglasii*, found upon the shoots of the Douglas Fir; and several others.

BOTTIONEA THYSANOTOIDES. The correct name of **Trichopetalum stellatum** (which *see*).

BOUCEROSIA. SYNS. *Apteranthes*, *Desmidorchis*, *Hutchinia*. About a dozen species have been recorded; they are found in India, Arabia, North Africa, Spain, and Sicily. In addition to those described on p. 205, Vol. I., *B. incarnata* (SYN. *Podanthes incarnata*) and *B. mammillaris* (SYN. *Stapelia pulla*, B. M. 1648) have been introduced, but are probably lost to cultivation.

BOUCHEA. Including *Chascanum*. This genus comprises sixteen or seventeen species, natives of the warmer parts of America, tropical and South Africa, and the western provinces of India.

BOUGAINVILLÆA. SYN. *Josepha*. This genus comprises seven or eight species of shrubs or small trees, rarely sarmentose or somewhat climbing, natives of tropical and sub-tropical South America. Flowers inserted below the middle of the bracts; perianth tubular, slightly curved; inflorescences solitary or fascicled, axillary or terminal. Leaves alternate, petiolate, rounded-ovate or elliptic-lanceolate, entire. To the species described on pp. 205-6, Vol. I., the following should be added:

B. fastuosa (proud). A synonym of *B. speciosa*.

B. glabra Sanderiana (Sander's). A very floriferous variety. 1895.

B. refulgens (shining). *fl.*, bracts brilliant purple-mauve, produced in long, pendulous racemes. *l.* dark green, pubescent. Brazil, 1887. Stove.

FIG. 179. BOUGAINVILLÆA SPECTABILIS.

Bougainvillæa—*continued.*

B. speciosa splendens (splendid). A distinct variety, having deep purplish-mauve bracts. 1895.

B. s. variegata (variegated). A garden variety with variegated foliage. 1890.

B. spectabilis lateritia (brick-red). In this variety the bracts are of a brick-red. (I. H. 466.) The inflorescence of the typical plant is shown in Fig. 179.

BOUILLIE BORDELAISE. *See* **Bordeaux Mixture.**

BOUNCING BET. *See* **Saponaria officinalis.**

BOURBON ROSES. Hardy, free-flowering, vigorous Roses, descended from *Rosa indica Bourboniana.* Souvenir de la Malmaison is still one of the best varieties.

BOURRERIA (named in honour of Bourrer, a Nuremberg chemist). SYNS. *Beurreria, Crematomia.* ORD. *Boragineæ.* A genus embracing sixteen or eighteen species of stove trees or shrubs, natives of the West Indies, Mexico, Central America, &c., and closely allied to *Ehretia.* Flowers whitish, often larger than in *Ehretia.* Leaves alternate or rarely somewhat whorled. Two of the species have been introduced, but they are of no great horticultural value.

BOURSAULT ROSES. Vigorous climbing Roses, descended from *Rosa alpina.*

BOURSE. This word, of French origin, has been applied to some peculiar swellings frequently seen upon trees and shrubs, and due to physical changes. On fruit trees, such as Apples and Pears, they are often found, and may be said to consist of nutritive elements stored up for the development of the fruits, but which, owing to the wood in the vicinity being killed, do not reach the growing point.

BOUSSINGAULTIA. The ten species included in this genus are all natives of tropical America. Flowers small, hermaphrodite, on short or slender pedicels, disposed in axillary and terminal racemes. Leaves alternate, petiolate or almost sessile, ovate, elliptic or cordate, more or less fleshy, entire. To the species described on p. 206, Vol. I., the following should be added:

B. cordata (cordate). A succulent climber, nearly allied to *B. baselloides.* Peru, 1895.

BOUTELOUA (named in honour of Estéban Boutelou, 1776-1813, Professor of Agriculture at Madrid, and Cláudio Boutelou, 1774-1842, Director of the Botanic Garden at Madrid). SYNS. *Actinochloa, Eutriana.* Including *Atheropogon.* ORD. *Gramineæ.* A genus embracing about twenty-five species of annual or perennial Grasses, all American. Spikelets unilateral, one- or two-flowered; glumes two, acute, carinate; spikes usually numerous, at the side of the peduncle, rarely reduced to a single, terminal one. *B. racemosa* (SYN. *Atheropogon apludioides*) has been introduced, but is of no particular horticultural value.

BOUVARDIA. SYN. *Æginetia.* This genus comprises about twenty-six species of herbs and shrubs, mostly Mexican. These choice greenhouse flowers are being more sought after year by year, owing to their great value for late autumn and winter flowering, especially for the making up of small bouquets, buttonholes, and for table decoration. To the species, &c., described on p. 207, Vol. I., the following should be added:

B. longiflora flammea (flame-coloured). *fl.* large, with a rosy-pink tube and salmon-coloured lobes.

B. scabra (scabrous). *fl.* bright pink, ½in. in diameter, freely produced in dense, corymbose cymes; corolla tube ¾in. to 1in. long, the lobes elliptic-ovate, somewhat acute. January. *l.* in distant whorls of three or rarely four, ovate, acuminate, narrowed to a very short petiole; lower ones 2in. to 3in. long, 1in. to 1½in. broad, the upper ones gradually smaller. Stems terete, herbaceous, hairy, 1ft. to 1½ft. high.

Varieties. The following are valuable additions to the list of varieties described on p. 207, Vol. I:

BRIDAL WREATH, white; CANDIDISSIMA, pure white; ELEGANS, scarlet; FLAVA, light yellow; HOGARTH FLORE PLENO, scarlet, double; HUMBOLDTII CORYMBIFLORA, white; INTERMEDIA, salmon-pink; JASMINOIDES, white, free; MRS. ROBERT GREEN, rose-pink; PRESIDENT CLEVELAND, bright scarlet, with rose tube, free, excellent; PRIORY BEAUTY, light rose; PURITY, white, very fragrant and free; SANG. LORRAINE, vermilion, double; THE BRIDE, white, blush tinted; THOMAS MEEHAN, bright scarlet, with paler tube, double; TRIOMPHE DE NANCY, orange-red, double; VICTOR LEMOINE, bright scarlet, very double; VULCAN, bright scarlet.

Bouvardia—*continued.*

BOWIEA (of Haworth) is now included under **Aloe** (which *see*).

BOWSTRING HEMP. *See* **Sanseviera.**

BRABYLA. A synonym of **Brabeium** (which *see*).

BRACHELYTRA. *See* **Staphylinidæ.**

BRACHIATE. A term applied to branches which are decussate and spreading—*e.g.*, those of the Ash.

BRACHIONIDIUM (from *brachion, brachionos,* an arm, and *eidos,* like; the column bears two arm-like processes). ORD. *Orchideæ.* A small genus (three species) of stove, epiphytal Orchids, natives of Colombia or Bolivia; they are closely related to *Masdevallia,* but have stem-like rhizomes. Flowers mediocre or rather large; sepals very shortly connate, or spreading from the base, produced in a point or tail; petals similar, but rather smaller; lip small, sessile, undivided; peduncle one-flowered. Leaf solitary, coriaceous, rather small. Only one species has been introduced. For culture, *see* **Masdevallia.**

B. Sherringii (Sherring's). *fl.* solitary, borne on a peduncle 1in. to 1½in. long; sepals and petals seven to eight lines long, the lateral sepals connate and shortly bifid; lip very short, three-lobed. *l.* ¾in. to 1½in. long, elliptic-lanceolate or ovate-oblong. Primary stems climbing and rooting; secondary ones short, one-leaved. West Indies, 1893.

BRACHYACHIRIS. A synonym of **Gutierrezia** (which *see*).

BRACHYCARPÆA (from *brachys,* short, and *karpos,* fruit). ORD. *Cruciferæ.* A small genus (two species) of greenhouse, sub-shrubby perennials, natives of South Africa. Flowers yellow or purple, large, in long, leafless racemes. Leaves oblong or linear, entire. *B. varians purpurascens* (SYN. *Polygala bracteolata*) has been introduced, but is probably not now in cultivation.

BRACHYCHEILA. A synonym of **Euclea** (which *see*).

BRACHYCHILUM (from *brachys,* short, and *cheilos,* a lip; in allusion to the suppressed labellum). ORD. *Scitaminеæ.* A monotypic genus. The species is a stove, herbaceous plant, allied to **Hedychium** (which *see* for culture).

B. Horsfieldii (Horsfield's). *fl.* yellow, few, in a terminal spike; corolla tube slender, the lobes linear, above ½in. long; lateral staminodia two, white or yellow, oblong, less than 1in. long; stamen as long as the corolla-tube. May. *l.* eight or nine, alternate, sessile, oblong-lanceolate, glabrous, less than 1ft. long. Stem stiffly erect, 2ft. long. Java, 1894.

BRACHYCHITON. Now included under **Sterculia** (which *see*), the specific names given on p. 208, Vol. I., remaining unchanged. *B. populneum* is a synonym of *S. diversifolia.*

BRACHYCOME. Including *Brachystephium.* Forty species are included in this genus: three are natives of New Zealand, one is tropical African, and the rest are Australian. To that described on p. 208, Vol. I., the following should be added:

B. diversifolia (variable-leaved). *fl.-heads* white, larger than in any other species; involucre about ½in. across; ray florets long and numerous. May. *l.,* lower ones often crowded, spathulate or oblong, coarsely toothed or pinnatifid; upper ones smaller and less divided. Stem usually simple, 1ft. to 2ft. high, rarely reduced to a short scape. Australia, 1824. A tufted, greenhouse perennial. SYNS. *Brachystephium leucanthemoides, Pyrethrum diversifolium* (B. R. 1025; H. E. F. iii. 215).

BRACHYGLOTTIS (from *brachys,* short, and *glossa,* a tongue; in allusion to the short ligulate corollas of the ray flowers). ORD. *Compositæ.* A monotypic genus. The species

Brachyglottis—*continued.*

is a noble, half-hardy tree or low shrub. It succeeds well in a compost of peat and loam in equal proportions, providing, of course, for drainage. It may be grown in pots for the conservatory. It is usual to pinch out the points of the growths frequently in order to secure bushy plants.

B. repanda (repand-leaved). *fl.-heads* minute, excessively numerous, tomentose. *l.* very large (6in. to 12in. long), alternate, petiolate, broadly ovate-oblong or cordate-oblong, irregularly lobed or waved on the margin, dark shining green above, densely soft, white, cottony-tomentose beneath. Branches slender, flexuous. New Zealand, 1895. This will probably prove a good seaside tree in favoured districts.

BRACHYLÆNA. SYN. *Oligocarpha.* Half-a-dozen species are included in this genus. Flower-heads dicœcious, discoid, in small racemes or panicles. Leaves alternate entire.

BRACHYLOMA (from *brachys*, short, and *loma*, a fringe; in allusion to the fimbriate scales or bunches of hair in the throat of the corolla). ORD. *Epacrideæ*. A genus embracing half-a-dozen species of greenhouse shrubs, of varying habit, all Australian. Flowers small, axillary, solitary, shortly pedicellate. Leaves striate-nerved. Two of the species, *B. ciliatum* (SYN. *Lissanthe ciliata*) and *B. daphnoides* (SYN. *L. daphnoides*, L. B. C. 466), have been introduced, but are probably no longer cultivated.

BRACHYLOMA (of Hanstein). Included under **Isoloma** (which *see*).

BRACHYOTUM. SYN. *Arthrostemma* (in part). This genus embraces about two dozen species of rigid, stove or greenhouse shrubs, natives of Peru, Bolivia, and Colombia. Flowers yellow or purple, rather large, drooping or nodding, one to three towards the tips of the branchlets; calyx lobes and petals four or five each; stamens eight or ten. Leaves usually ovate or oblong, with recurved margins.

BRACHYPTERIS (from *brachys*, short, and *pteron*, a wing; in allusion to the short wings borne by the fruits of this genus). ORD. *Malpighiaceæ*. A genus consisting of a couple of species of stove, twining shrubs, natives of tropical America and the West Indies. Flowers yellow, simply umbellate or corymbose; calyx five-parted; petals clawed, unequal. Leaves opposite, entire, petiolate. Only one species—*B. borealis*—has been introduced, and it is doubtful if that is now in cultivation.

BRACHYRHYNCHOS. Included under **Senecio** (which *see*), the correct name of *B. albicaulis* being *S. diversifolius pinnatifidus.*

BRACHYRIS. A synonym of **Gutierrezia** (which *see*).

BRACHYSCYPHA. Included under **Lachenalia** (which *see*). *B. undulata* is synonymous with *L. pusilla.*

BRACHYSEMA. About fourteen species, confined to tropical and Western Australia, are referred to this genus. To those described on pp. 208-9, Vol. I., the following should be added:

B. aphyllum (leafless). *fl.* red, pedicellate and solitary in the upper notches; calyx ⅜in. long; standard ovate, scarcely half as long as the calyx. Stems erect or diffuse, flat, with rigid, broad wings descending from the nodes, truncate and forming an obtuse notch at the upper end. 1849. (B. M. 4481.)

B. acuminatum is rare in cultivation.

BRACHYSPATHA. Bentham and Hooker include this under **Amorphophallus** (which *see*).

BRACHYSTELMA. About fourteen species, natives of South and Eastern tropical Africa, are included in this genus. To those described on p. 209, Vol. I., the following should be added:

B. caffrum (Kaffir). *fl.* bright clear yellow, lateral between the bases of the leaves, solitary or rarely two from the same node; corolla rotate. July. *l.* ovate, acute, ⅛in. to ⅜in. long. Stems slender, scaberulous, 3in. to 5in. long. S. Africa, 1894.

B. caudatum (tailed). A synonym of *B. crispum.*

B. crispum (crisped). *fl.* greenish, with dark spots; corolla segments long-attenuated. September. *l.* oblong, obtuse, sinuated, irregularly undulated-crisped, attenuated into the petioles. *h.* 6in. South Africa, 1829. (B. M. 3016.) SYN. *B. caudatum.*

BRACHYSTEPHIUM. Included under **Brachycome** (which *see*). *Brachystephium leucanthemoides* is synonymous with *Brachycome diversifolia.*

BRACTEOSE. Having large or numerous bracts.

BRADLEIA. Included under **Phyllanthus** (which *see*).

BRAHEA. Of the four known species of this genus, one is indigenous to Mexican Texas and the mountains of Mexico, and the rest inhabit Mexico and the Andes. To that described on p. 209, Vol. I., the following should be added:

B. edulis (edible). A synonym of *Erythea edulis.*

B. filamentosa (thread-like). A synonym of *Washingtonia filifera.*

B. glauca (greyish-green). A garden synonym of *Erythea armata.*

B. nitida (shining). *fl.*, spadix very large, much branched, glabrous. *fr.* black, about the size of a pea. *l.* large, fan-like, palmately cleft, glaucous-green. Mexico, 1887. (R. H. 1887, p. 344, f. 67-70.)

B. Roëzlii (Roëzl's). A synonym of *Erythea armata.*

BRAINEA. The roots of *Brainea insignis* are of a remarkably brittle nature, and great care must be taken in repotting; if that operation is carelessly done, a certain quantity of roots are mutilated, and the chances are that the plant will never recover. The compost which it prefers is a mixture of fibrous peat and loam in equal parts, with the addition of some sharp sand; it also requires thoroughly good drainage, as it should receive plenty of water at the roots and on the stem. It is usually propagated from spores, which germinate freely.

BRAKE FERN. *See* **Pteris aquilina.**

BRAKE-ROOT. *See* **Polypodium vulgare.**

BRAMIA. A synonym of **Herpestis** (which *see*).

BRANCHING ANNUAL STOCK. A common name for **Malcolmia maritima** (which *see*).

BRAND. This is another popular name for the *Ustilagineæ*, or Smut Fungi.

BRANDED PINE WEEVIL. A popular name for *Pissodes notatus*, described and illustrated under **Pine Weevils** (Vol. III.).

BRANDTIA. A synonym of **Arundinella** (which *see*).

BRASENIA SCHREBERI. The correct name of the plant described on p. 164, Vol. II., as *Hydropeltis purpurea. Brasenia* is a monotypic genus.

BRASSAIOPSIS (from *Brassaia*, an allied genus, not known in our gardens, and *opsis*, resemblance). ORD. *Araliaceæ*. A genus comprising about eight species of prickly or unarmed, glabrous or tomentose, stove, evergreen trees or shrubs, natives of the East Indies and the Indian Archipelago. Flowers usually polygamous; calyx five-toothed on the margin; petals five, valvate; stamens five; pedicels continuous with the flowers; umbels in large, compound panicles. Leaves digitate or palmate. Only one species calls for mention here. It requires similar culture to the stove species of **Aralia** (which *see*).

B. speciosa (showy). *fl.* yellow; panicle usually 1ft. or more in length; bracts at the base of the branches persistent. April. *l.* digitate; leaflets lanceolate or elliptic, 4in. to 8in. long, 1in. to 3in. broad, rounded or attenuated at base, entire, crenulate or lightly sub-serrate; petiolules usually more than 1in. long. India, 1847. SYN. *Hedera glomerulata* (B. M. 4804; R. G. 1863, t. 411).

BRASSAVOLA. About a score species, ranging from Mexico and the West Indies to Brazil, are included in this genus. Several formerly classed here (including

Brassavola—*continued.*

B. Digbyana and *B. glauca*) are now referred to *Lælia*, under the same specific names. The plants require similar treatment to that recommended for **Cattleya.**

B. elegans (elegant). A synonym of *Tetramicra rigida.*

BRASSIA. This genus embraces about a score species. To those described on pp. 209-10, Vol. I., the following should be added :

B. bicolor (two-coloured). *fl.* yellow and brown; sepals 2½in. long, acuminate; petals 1½in. long; lip lanceolate-oblong, 1⅝in. long, the margin slightly undulated; scape erect, many-flowered. *l.* linear-oblong. Pseudo-bulbs oblong or ovoid-oblong, somewhat compressed. Peru. (L., t 378.)

B. brachiata (branched). *fl.* very large, seven to ten in a raceme; sepals light yellowish-green, spotted near the base, 6in. long; petals 4in. long, with more spots at base; lip light yellow, the basal half with revolute margins; crest white, spotted with orange. *l.* linear-lanceolate, 9in. to 12in. long. Pseudo-bulbs 3in. to 5in. long. Guatemala, 1843. (B. R. 1847, t. 29.)

B. caudata hieroglyphica (hieroglyphic). In this variety the spots are more prominent and of hieroglyphic appearance. (L., t. 76.)

B. cinnamomea (cinnamon). A synonym of *B. Keiliana.*

B. elegantula (rather elegant). *fl.* small; sepals green, with brown bars, spreading; lip white, with two keels, hairy inside, dotted purplish-brown in front of the calli; raceme two- to five-flowered. *l.* and pseudo-bulbs glaucous. Mexico, 1885. An elegant species.

B. guttata (striped). A form of *B. maculata.*

B. Keiliana (Keil's). *fl.* disposed in a loose, many-flowered raceme; sepals and petals at first yellow, eventually turning brownish-orange; lip whitish; bracts boat-shaped, longer than the ovaries. Colombia. A dwarf and compact species; it will thrive in the Cattleya house. (R. G. 1862, t. 365; R. X. O., t. 45, three forms.) SYNS. *B. cinnamomea* and *Oncidium Keilianum.*

B. K. tristis (sad). *fl.* spider-like, borne in long spikes; sepals and petals deep sepia-brown; lip lemon-yellow, with a semi-circular series of brown spots at the base, the apical tail longer and springing more abruptly from the light yellow blade. 1895. A curious variety. (R. X. O., t. 45, f. 3; W. O. A. 347.)

B. Lewisii (Lewis's). *fl.* ten to twelve in a raceme; sepals and petals greenish-yellow, spotted with brown; lip pale yellow, with white keels and orange marks; raceme about 9in. long. *l.* linear-oblong, 6in. long. Pseudo-bulbs oblong. Habitat not recorded. 1893.

B. maculata major (larger). *fl.* freely produced; sepals and petals greenish-yellow, spotted brown; lip white, spotted dark brown. Jamaica.

B. signata (marked). *fl.* small, seven to ten to a scape; sepals and petals bright green, spotted with brown in the basal half, the former 2in. long, the latter smaller; lip white, oval, shell-like, with two brown-purple spots and a yellow one. *l.* broadly strap-shaped, 9in. to 12in. long. Pseudo-bulbs 3in. to 5in. long, two-leaved. Origin unknown. 1881.

BRASSICA. This important genus embraces about eighty species (as many as 150 have been described as such), broadly dispersed, but not indigenous in either Australia or America. Nine species are natives of Britain. *Sinapis*, which is included here by Bentham and Hooker, is kept separate in this work. Some of the Kales are used for ornamental purposes, and will grow in almost any soil.

B. oleracea crispa (curled). *l.* arching, elegantly cut into curled divisions. *h.* 4ft. An ornamental variety, seen to perfection in autumn and winter.

B. o. fimbriata (fringed). *See* **Borecole.**

B. o. palmifolia (palmate-leaved). *l.* produced near the summit of the stem, and having an almost Palm-like appearance. *h.* 6ft. An ornamental form, producing a fine effect in summer and autumn.

BRASSO-CATTLEYA. The name given to a supposed natural hybrid between *Brassavola tuberculata* and *Cattleya intermedia.*

BRASSO-CATT-LÆLIA. *Lindleyano-elegans* is the name given to a hybrid (*Brasso-Cattleya Lindleyana* and *Lælio-Cattleya elegans*) raised by Lawrence.

BRAUNEA (in part). A synonym of **Tiliacora** (which *see*).

BRAVOA. SYN. *Cætocapnia.* According to J. G. Baker, there are four species, natives of Mexico. Flowers red or whitish, usually twin; perianth persistent, the tube

Bravoa—*continued.*

long and almost cylindrical, the lobes short, ovate, subequal; racemes long. Radical leaves few, lanceolate or linear; cauline ones much smaller. To the information given on p. 211, Vol. I., the following should be added :

B. Bulliana (Bull's). A synonym of *Prochynanthes Bulliana.*

BRAWLINS. *See* **Vaccinium Vitis-Idæa.**

BRAYA (named after Count Bray, a German botanist). Including *Platypetalum.* ORD. *Cruciferæ.* A genus embracing about a dozen species of tufted, hardy perennials, natives of Europe, Asia, Africa, and tropical mountainous regions. Flowers white, pink, or purple; sepals short; stamens free; raceme short or elongated, sometimes corymbose, often leafy at base; scape usually naked, sometimes one-flowered. Leaves radical, spathulate or linear, entire or toothed. *B. alpina* (SYN. *B. purpurascens*) has been introduced, but it is of little horticultural value.

BRAZORIA (the original species was discovered on the Rio Brazas, in Texas). ORD. *Labiatæ.* A small genus (three species) of hardy annuals, natives of North America. Flowers rose-purple, disposed in twiggy racemes or spikes; calyx bilabiate, the upper lip two-lobed, the lower three-lobed; corolla with an inflated throat and a more or less exserted tube. Leaves oblong, mostly sessile, denticulate, the lowest tapering into a petiole; floral ones reduced to small bracts. Only one species calls for mention. It thrives under ordinary treatment in rich soil.

B. scutellarioides (Scutellaria-like). *fl.*, corolla ½in. long, its lobes entire or merely retuse; spikes or racemes loose, mostly panicled. Summer. *l.* as above described. *h.* 1½ft. Texas. 1834. SYN. *Physostegia truncata* (B. M. 3494).

BREAK. This term has several horticultural meanings: To put forth new leaves or buds; to "bolt" or run to seed prematurely; to depart from the typical form, producing a new variety. It is also applicable to Vines when they start into growth. If the buds all shoot regularly, the whole length of the rod, or cane, is termed a "good Break." On the other hand, if the buds fail to start in places, and blank spaces are left on the rods, it is considered a "bad Break." Bulbs are said to Break when they send forth growths and roots. Sometimes when a plant produces a sport distinct in character it is said to be a Break. The first Break in Chrysanthemums is usually about the middle of May, a little earlier or later, according to the time of rooting the cuttings.

BREAKSTONE. *See* **Saxifraga.**

BREAST-WOOD. On espalier and all trees trained against walls the wood that grows out in front of the trees is termed Breast-wood. If bent in it would form unsightly branches. It is much the better plan to cut all such Breast-wood into about three eyes at the end of July, and then in winter cut back to a couple of eyes, entirely removing some if very numerous.

BREHMIA. A synonym of **Strychnos** (which *see*).

BREMONTIERA (named in honour of M. Bremontier). ORD. *Leguminosæ.* A monotypic genus. The species, *B. Ammoxylon*, is a stove, evergreen shrub, native of Mauritius; it was introduced in 1826, but is probably no longer grown.

BREVOORTIA (a commemorative name). ORD. *Liliaceæ.* A monotypic genus. The species, *B. Ida-maia*, is the plant described on p. 213, Vol. I., under its old name, *Brodiæa coccinea.*

BREXIA. SYN. *Venana.* One or two species, confined to Madagascar, are referred to this genus.

BREYNIA (named in honour of Johann Philipp Breyn, a German botanist). SYN. *Melanthesa.* ORD. *Euphorbiaceæ.* A genus embracing about a dozen species of stove or greenhouse shrubs or small trees, natives of tropical Asia, Australia, and the South Pacific Islands. Flowers monœcious, apetalous, small, axillary, pedicellate, solitary in the axils or the males fascicled. Berry globose

Breynia—*continued.*

or depressed. Leaves alternate, petiolate, often distichous and drying blackish. Only one species is known to cultivation. For culture, *see* **Phyllanthus.**

B. turbinata (turbinate). *fl.* green, those of both sexes borne on the same raceme. July. *l.* coriaceous, 1½in. long, ¾in. to 1in. broad, rhomboid-ovate, acute, glaucous and minutely foveolate-dotted beneath. *h.* 2ft. China. SYN. *Phyllanthus turbinatus* (B. M. 1862; L. B. C. 731).

BRICKELLIA (commemorative name). Including *Bulbostyles* in part. ORD. *Compositæ.* A genus embracing about forty species of stove or greenhouse herbs or under-shrubs, all American. Flower-heads white or pink, homogamous, paniculate. Leaves opposite or alternate, toothed or entire, rarely cut. One or two of the species have been introduced, but the following is the only one calling for mention. For culture, *see* **Eupatorium.**

B. grandiflora (large-flowered). *fl.-heads* reddish, disposed in large, terminal corymbs. *l.* rugose, cordate, acute, serrated. Stem paniculate at summit. North America, 1883. An ornamental, hardy perennial. SYN. *Eupatorium grandiflorum* (R. H. 1882, p. 384).

BRIDGESIA. A synonym of **Ercilla** (which *see*).

BRIGNOLIA. A synonym of **Isertia** (which *see*).

BRILLANTAISIA. SYNS. *Belantheria, Leucorhaphis.* About seven or eight species, natives of tropical Asia and Madagascar, are included in this genus.

BRINDLED BEAUTY MOTH (*Biston hirtarius*). Frequently this Moth causes the gardener and the forester no little anxiety on account of its ravages upon Plums, Pears, Oaks, Elms, Limes, &c. Even in London its presence is very familiar. The Moth is on the wing during April and May, and though not conspicuous as to markings, it measures about 2in. in wing-expanse. The fore-wings are greyish-brown, sprinkled with a darker colour, and like the lighter hind-wings irregularly banded with black, though these latter markings are not as distinct in the hind-wings as in the fore-wings (see Fig. 180). The male has beautifully fringed antennæ, as shown in the illustration; whereas in the female these organs are filiform. The eggs are deposited in rings upon the food-plant selected, and therefore are fairly conspicuous. They should always be destroyed.

FIG. 180. BRINDLED BEAUTY MOTH.

FIG. 181. CATERPILLAR OF BRINDLED BEAUTY MOTH.

From June to July the caterpillars (see Fig. 181) may be found; they are voracious feeders, and the foliage suffers considerably. They are of a variable brown colour, with bright yellow dots upon each segment. When full-fed, the pupal state is assumed beneath the soil, the perfect insect emerging in the spring of the following year.

Besides the preventive measures already suggested in connection with the destruction of the eggs, the caterpillars may be destroyed by poisoning their food-plant with Paris Green (1oz. to 20gall. of water).

BRINDONIA. A synonym of **Garcinia** (which *see*).

BRINING. A method employed to hasten the germination of those seeds having hard shells. It consists in steeping them in warm water for twenty-four hours before sowing, and is especially advisable with such seeds as those of Cannas and Palms.

BRISTLE FERN. *See* **Trichomanes.**

BRIZA. The ten species of this genus inhabit Europe, North Africa, temperate Asia, and South America. Leaves flat or narrowly convolute, sometimes bristly. To the species described on pp. 211-2, Vol. I., the following should be added:

B. rotundata (round). *fl.* disposed in narrow panicles; spikelets erect. *l.* erect, narrow. Mexico, Brazil, and Chili, 1887. An ornamental, annual Grass. (R. G. 1887, p. 638.)

BROAD BEAN RUST (*Uromyces fabæ*). The name above adopted would suggest that the Broad Bean alone was attacked by this Rust, but this is not the case. Peas and several wild plants are similarly affected. Usually the disease is not noted until the brown spots on the foliage (uredospore stage) have made their appearance. Prior to this, however, there has been a Cluster-cup (æcidium) stage. Plants which have reached the uredospore (summer spore) stage quickly spread the disease, unless spraying with a fungicide (liver of sulphur) is adopted. Finally, teleutospores are formed, and these carry the fungus over the winter to repeat the mischief in the following spring. All old haulms should be burned and not buried, as is frequently case in cottage and allotment gardens.

BROAD-BORDERED YELLOW UNDER-WING. *See* **Tryphæna.**

BROCCHIA (of Mauri). A synonym of **Simmondsia** (which *see*).

BROCCHINIA (named after Giovanni Battista Brocchi, an Italian naturalist). ORD. *Bromeliaceæ.* A small and very distinct genus (three species) of stove plants with a woody, Yucca-like trunk, natives of Brazil and Guiana. Flowers whitish, small, in a loose, decompound panicle; perianth inserted above the middle of the ovary; sepals obovate-oblong, as long as the orbicular, short-clawed petals; stamens a little shorter than the sepals and petals; ovary three-celled. Leaves densely rosulate, with a large, entire, lorate blade. Only one species has yet been introduced. It requires culture similar to **Billbergia** (which *see*).

B. Andreana (André's). A synonym of *B. cordylinoides.*

B. cordylinoides (Cordyline-like). *fl.* yellowish-white, less than ¼in. long; panicle 6ft. to 8ft. long; peduncle shorter than the leaves. Autumn. *l.* 3ft. to 4ft. long, 6in. to 7in. broad, deltoid at apex. Trunk 12ft. to 15ft. high, 6in. to 8in. in diameter. British Guiana, 1882. SYNS. *B. Andreana* and *R. demerarensis* (of gardens), *Cordyline macrantha* (G. C. 1880, ii. 243, f. 47).

B. demerarensis (Demerara). A synonym of *B. cordylinoides.*

BROCCOLI. Two new varieties that deserve mention are Walcheren and Early Purple Sprouting. These, with the other early varieties named—Veitch's Self-protecting Autumn Purple Cape and Snow's Winter White—will afford a supply until Christmas, or later. Then should follow, in the order named, Improved Sprouting, Osborne's Winter White, Early White, Perfection, Leamington, April Queen, Latest of All, Model, and Late Queen. These would continue the supply until June, when Cauliflowers are ready.

BRODIÆA. Bentham and Hooker include here *Calliprora, Hesperoscordon,* and *Triteleia,* the genus as thus constituted comprising about thirty species, all extra-tropical American. To those described on p. 213, Vol. I., the following should be added. *See also* **Calliprora** and **Triteleia.**

Brodiæa—*continued.*

B. californica (Californian). This is closely related to *B. grandiflora*, but has flowers varying from rose-colour to deep purple, 1½in. to 2in. long, twenty-five in an umbel, and borne on a longer scape. Sacramento Valley. The best of all the species.

B. capitata pauciflora (few-flowered). *fl.* fewer and pedicels longer than in the type. 1896. There is also a white variety, *alba* (G. C. 1896, xx., p. 238, f. 44).

B. coccinea. The correct name is *Brevoortia Ida-maia.*

B. Douglasii (Douglas'). *fl.* violet-blue, inodorous, ten to twenty in a dense umbel; perianth funnel-shaped, 1in. long, the segments oblong, acute; scape slender, 1ft. to 1½ft. long. May. *l.* generally two, light green, flaccid, deeply channelled, shorter than the scape. Bulb small, globose. California, &c., 1876. (B. M. 6907.)

B. grandiflora Warei (Ware's). *fl.* lilac-rose, 3in. long; scape 2ft. to 2½ft. high. California, 1886. A beautiful variety.

B. Howellii lilacina (lilac-coloured). A charming little hardy plant, producing umbels of deep bluish-lilac flowers, not unlike an Agapanthus in shape. 1894. (Gn., 1894, xlvi., p. 502, pl. 992.)

B. hyacinthina lactea (hyacinth-blue, milky). The correct name of *B. lactea.* (G. C. 1896, xx., p. 459, f. 80).

B. ixioides erecta (erect). *fl.* bright yellow, about thirty in a spreading umbel. 1896. A dwarf form.

B. minor (lesser). *fl.* two to six in an umbel; perianth 1in. or less in length, with a more spreading limb; scape slender, 3in. to 6in. long. Otherwise like *B. grandiflora.* Southern California.

B. Orcuttii (Orcutt's). *fl.* bright lilac, less than 1in. long, with a very short tube, five to fifteen in an umbel; filaments longer than the anthers; peduncle stout, 1ft. or more in length. *l.* linear, flat, conduplicate. San Diego, 1896. (G. C. 1896, xx., p. 215, f. 40.)

B. Palmeri (Palmer's). *fl.* bright lilac, ½in. long, shortly stalked, many in an umbel; segments oblong, as long as the obconic tube. *l.* numerous, firm, very thin, linear. *h.* 1ft. to 2ft. California, 1889. This plant produces a large number of small bulbils on the surface of the ground. (G. & F. 1889, p. 245, f. 107.)

B. rosea (rosy). *fl.* rose-red, less than 1in. long, five to eight in an umbel; free portion of fertile filaments dilated; staminodia white; peduncle 3in. to 6in. long. *l.* sub-terete. Lake County, 1896. (G. C. 1896, xx., p. 213, f. 39.)

B. volubilis. The correct name is *Stropholirion californicum.*

BROMELIA. SYN. *Agallostachys.* As this genus at present stands, according to J. G. Baker, it embraces only half-a-dozen species, a large number of plants formerly placed under *Bromelia* being now classed under those genera named on p. 213, Vol. I., and under *Distiacanthus* and *Rhodostachys.* Inflorescence a dense panicle, the lower branch-bracts with a serrated cusp, and the crowded, arcuate stem-leaves similar to the rosette-leaves in texture, but shorter and often bright red. Fruit a large, yellowish berry.

B. amazonica (Amazon). A synonym of *Disteganthus scarlatinus* and *Karatas amazonica.*

B. antiacantha is a synonym of *B. fastuosa.*

B. bicolor is a synonym of *Rhodostachys bicolor.*

B. Binoti (Binot's). A garden form of *B. Pinguin.*

B. carnea (fleshy). A synonym of *Rhodostachys andina.*

B. fastuosa (proud). *fl.* reddish-violet; panicle 1ft. to 2ft. long, stiffly erect, the branch-bracts pale, with spine-edged cusps; peduncle 1ft. long, its leaves 1ft. to 1½ft. long, often bright red. August. *l.* 100 or more in a rosette, 4ft. to 5ft. long, 1½in. to 2in. broad, with copious hooked, pungent, yellowish prickles. Central and South Brazil, 1815. Plant stemless. (L. C. B. 1; R. G. 493.) SYNS. *B. antiacantha, Karatas antiacantha.*

B. Joinvillei is a synonym of *Rhodostachys bicolor.*

B. laciniosa (torn). *fl.* in a very dense panicle 2in. to 3in. in diameter; petals dull lilac, faintly tomentose at tip; peduncle 1ft. long, its leaves bright red. *l.* rigid, ensiform, sub-erect in the lower half, 4ft. to 5ft. long, 1½in. broad, with large, hooked prickles. North Brazil, 1873. Plant stemless. SYN. *Karatas guianensis.*

B. paraguayensis (Paraguay). A garden form of *B. Pinguin*

B. Pinguin (native name). *fl.* in a dense, stiffly erect panicle 1ft. to 2ft. long, with densely mealy branches; petals reddish, densely white-tomentose at tip; peduncle erect, 1ft. long. March. *l.* 100 or more in a rosette, erect in the lower half, 5ft. to 6ft. long, 1½in. to 2in. broad, with very large, toothed, brown prickles. Tropical America, 1690. Plant stemless. *B. Binoti* and *B. paraguayensis* are garden varieties with bright red inner leaves.

B. undulata (wavy). A synonym of *Ananas macrodontes.*

B. zebrina (zebra-streaked). A synonym of *Billbergia zebrina.*

BROMHEADIA (named in honour of Sir E. F. Bromhead, Bart). ORD. *Orchideæ.* A small genus (about four species) of rigid, terrestrial or epiphytal, stove Orchids, extending from Siam and Birma to Singapore and the Malayan and Philippine Islands. Flowers usually showy, white or orange; sepals lanceolate, acute, keeled; petals rather shorter and broader than the sepals; lip three-lobed, the lateral lobes erect, the middle one longer; column curved, elongated; pollen masses two; racemes one- to three- or many-flowered, flexuous, elongated, rarely short and congested. Leaves distichous, rigid, usually lanceolate, obtuse, bilobed at apex, rarely ensiform, re curved, pointed. Stems not bulbous, compressed. *B. palustris*, which is probably the only species known in gardens, thrives in a compost of fibry peat and sand. It may be increased by means of offsets or by division after the flowering period. The name *palustris* is, according to Mr. H. N. Ridley ("Journal of the Linnean Society," vol. xxviii., p. 331), most inapt, as the plant prefers hot, sunny places as its habitat.

B. palustris (marsh-loving). *fl.* large, sweetly scented, opening in the early morning and very soon closing; sepals pure white or tinged with pink, 1½in. long; petals pure white; lip white, veined with violet-pink; raceme flexuous, about 3in. long. June. *l.* spreading, rather distant below, and gradually passing into sheaths at the top of the otherwise bare stem. *h.* 1ft. to 6ft. Cochin China, &c., 1840. (B. M. 4001.)

BRONGNIARTIA. Including *Peraltea.* The eight species forming this genus are distributed over Chili, Bolivia, and Central America.

BROOK-WEED. *See* **Samolus.**

BROOM, ROCK. *See* **Genista.**

BROOM, RUSH. *See* **Spartium junceum** and **Viminaria.**

BROSIMUM. Cow-tree. With this genus Bentham and Hooker regard *Galactodendron* (see p. 39, Vol. II.) and *Piratinera* as synonymous. It includes about eight species, natives of tropical America.

B. Galactodendron. The correct name of *Galactodendron utile.*

BROTERA (of Willdenow). A synonym of **Cardopatium** (which *see*).

BROTERA (of Cavanilles). A synonym of **Melhania** (which *see*).

BROTERA (of Sprengel). A synonym of **Hyptis** (which *see*).

BROWALLIA. ORD. *Solanaceæ.* Tropical America is the home of the half-dozen species included in this genus. To those described on p. 214, Vol. I., the following should be added:

B. Czerwiakowski (Czerwiakowski's). A synonym of *B. viscosa.*

B. elata is synonymous with *B. demissa.*

B. pulchella (pretty). A garden synonym of *B. viscosa.*

B. speciosa (showy). *fl.* solitary, thrice the size of those of *B. grandiflora*; corolla hypocrateriform, the tube thrice the length of the calyx, the limb pale lilac beneath, dark purple above, striated. September. *l.* opposite or alternate, ovate, acuminate. Stem erect. *h.* 2ft. Tolima and Quindiu, 1846. (B. M. 4339.) The variety *major* has larger flowers than the type. 1894.

B. viscosa (clammy). *fl.*, calyx segments lanceolate, acute; corolla with violaceous, obovate, emarginate segments, the largest spotted white at base, the tube whitish, inflated at top; peduncles crowded at the tops of the branches. Summer. *l.* roundish-ovate, obtuse, hairy, 1in. to 1½in. long. *h.* 1ft. to 2ft. Colombia. Half-hardy annual. (R. G. 142.) SYNS. *B. Czerwiakowski, B. pulchella* (of gardens).

BROWN CLOVER. *See* **Trifolium spadiceum.**

BROWNEA. About eight species, all tropical American, are included in this genus. To those described on p. 215, Vol. I., the following should be added:

B. Crawfordii (W. H. Crawford's). *fl.* rich rosy-red, 3in. long, 1in. across, disposed in clusters of as many as seventy. *l.* about 2ft. long; leaflets six to ten pairs, the largest 1ft. long and 3in. broad. *h.* 15ft. 1891. A hybrid between *B. grandiceps* and *B. macrophylla.*

B. erecta (erect). A synonym of *Talisia princeps.*

B. princeps (of gardens). A synonym of *Talisia princeps.*

BROWNING, or BRUNISSURE. Although this troublesome disease is usually associated with Vines, yet it is by no means confined thereto, Apples, Pears, Cherries, Apricots, Melons, Cucumbers, Aucubas, and several others being liable to its attacks. The disease is one which frequently troubles the gardener, and even the plant-pathologist is not altogether certain as to its origin. By many it is ascribed to the presence of one of the so-called Slime fungi, which Viala and Sauvageau have named *Plasmodiophora vitis*, thus making it a near relative of the pest causing Club Root in Cabbages and other *Cruciferæ*. Others favour the idea that the disease is due rather to errors in cultivation. One thing, however, is certain, that the presence of green manure, badly-drained quarters, and wet and sunless weather, are predisposing causes.

The symptoms, as the common names above adopted suggest, are a Browning of the foliage, or it may be of the parts adjacent thereto. The spots are pale at first, and small, but rapidly extend, and change to a brown or reddish-brown, and not infrequently prematurely fall.

Where cultural errors like those noted above exist, they should be remedied; while the employment of a fungicide, such as sulphide of potassium (½oz. to 1gall. of water), should also be tried.

BROWNLEEA (named in honour of Rev. J. Brownlee, a missionary stationed in King William's Town, Caffraria, who discovered two of the species). ORD. *Orchideæ*. A small genus (three species) of greenhouse, terrestrial Orchids, natives of South Africa. They are closely allied to **Disa** (which *see* for culture), but have a very small, upturned lip, and an erect, concave or helmet-shaped odd sepal without a spur. Only one species is known to cultivation.

B. cærulea (blue). *fl.* pale blue, with violet dots and a long, straight spur; spike erect, lax, many-flowered. *l.* two or three, sessile or shortly petiolate, ovate or lanceolate, acuminate, three-ribbed. Stem erect, annual, springing from an amorphous, lobed tuber. 1893. (B. M. 7309.)

BROWNLOWIA. Three species of stove trees, natives of tropical America, are included in this genus. Flowers yellow, mediocre or rather small; calyx campanulate, irregularly three- to five-cleft; petals five, narrowed at base; stamens indefinite. Leaves entire, three- to five-nerved at base and penniveined.

BROWN ROT OF FRUIT (*Monilia fructigena*). Many kinds of fruits, both hard and soft, from the Apple and Pear to the Strawberry and Cherry, are liable to attacks from this mould, and in the case of Strawberries it is very difficult to deal with. The fungus attacks all parts of the plant from leaves to fruits, though the condition is more familiar to the gardener in the case of the latter, in which the first symptoms are the brownish-red patches, followed later by the greyish tufts, consisting of chains of spores arranged somewhat concentrically, waiting to be disseminated. The fruits attacked eventually have a dried-up appearance, and the small branches die away. The disease is tided over the winter by means of the hard bodies known as **Sclerotia** (which *see*). These form in the dried up fruits and, with the bursting of the new leaves, the tree is again attacked by the spores of the fungus released.

All shrivelled fruits should be removed and burned, and the foliage and twigs should be similarly treated. Care should also be taken that all fallen foliage and fruits are collected and burnt. Early in the New Year trees like Apples, Pears, Plums, and Cherries should be well sprayed with copper sulphate, ¾lb.; water, 15gall. This must never be applied to trees with expanded buds. It is a winter dressing only. Sulphide of potassium (1oz. to 3gall. of water) should also be tried at intervals when the leaves in the young state show the greenish-brown mould. In

Brown Rot of Fruit—*continued.*

the case of Strawberries more drastic measures have to be taken. The plants, after the crop has been gathered, should be cut down and the whole burned; while the next season, weak Bordeaux Mixture or sulphide of potassium should be thoroughly sprayed on before they blossom.

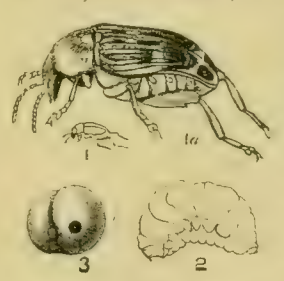
BROWN-TAIL MOTH. At times this Moth, which is illustrated and briefly described in Vol. II., under **Liparis**, proves very destructive to orchard trees, and also to other trees in park and garden. The insects are very prolific, and from two hundred to three hundred eggs are laid by an individual. The eggs themselves are seldom seen, as they are ingeniously covered up by the hairs found at the anal extremity of the female, which then dies. The eggs hatch out in August, and the little insects live gregariously. As the cold weather approaches, they betake themselves to shelters which they make, first having secured the leaves by means of threads. Here they remain until the following spring, when they emerge from their retreat and start upon the unopened buds, and eventually on the flowers and leaves. Towards the end of May the colonies break up, and the caterpillars may be found singly and nearly full-fed. Care should be taken not to handle the hairy larvæ, as the hairs sting and cause considerable pain.

The cocoons in which the pupal state is passed may be found between spun-together leaves. As these also contain the irritable hairs of the larvæ, they should be carefully handled.

All fruit trees should be examined in winter, as, being bare, nests, &c., of destructive Moths may be more readily seen and destroyed.

BRUCEA. SYN. *Nima*. This genus comprises five species, natives of tropical Asia, Africa, Australia, and Northern India. They are remarkable for their intensely bitter properties, similar to Quassia.

BRUCHUS. A large genus of Beetles, of which thirteen species are either natives of, or introductions into, this country. The larvæ are very destructive to Peas, Beans, and other Leguminous plants. The characters of the family are set forth under **Beetles.** The chief is that the head is free and produced in front. There is not, however, a distinct beak, as in the Weevils. Two species are very abundant here—*B. pisi* infesting Peas, and *B. rufimanus* Beans; there also occurs another species in goodly numbers, *B. fabæ*, an insect which is very destructive in America alike to the crops when growing, and when housed in the granaries.



By permission of the Board of Agriculture.

FIG. 182. PEA BEETLE (*Bruchus pisi*).

1 and 1a, Beetle, natural size and magnified; 2, Larva, magnified; 3, Pea, showing escape-hole of insect.

B. pisi (Fig. 182) is oblong-ovate and black; the wing-cases, which do not cover the whole of the body, are banded, and covered with greyish-brown pubescence. The Beetles, which are about ⅛in. long, are on the wing at the time the Peas are podding. The eggs are deposited on the newly-formed pods, and in due time the larvæ bore through and feed upon the seeds, gnawing through them except for a very thin skin. The remaining stages are passed in the Peas, and finally the Beetle emerges through the exit-hole practically made by the larvæ before assuming the pupa-state. Such infested Peas germinate badly, if at all. Care, therefore, should be taken to remove all black-specked ones at the time of sowing. According to Prof. Riley, one test is to put the seed-Peas into water, and reject as unsound

Bruchus—*continued.*

those which float. In America, where large quantities of Peas are grown to supply the markets, bi-sulphide of carbon fumes are used to destroy the Beetles which have arrived at maturity. The larvæ are more difficult to reach on account of the exit-hole being covered by a thin lining.

B. rufimanus is equally as destructive to Beans as its relative above-named is to Peas. It has many of the characters of *B. pisi*, but is smaller, and the anterior pair of legs are red (hence *rufimanus*). Both these Beetles fly well, so that, even if they emerge in the stores, which they frequently do, they are able to reach gardens where Beans are grown. The life-history of *B. rufimanus* is practically identical with that given of *B. pisi*.

Remedial measures in either case are out of the question; the cultivator must rely entirely upon preventive ones, by exercising great precaution when seed-sowing.

BRUGMANSIA. *B. floribunda* and *B. parviflora* are synonyms of **Juanulloa aurantiaca** (which *see*).

BRUINSMANIA. A synonym of **Zsertia** (which *see*).

BRUISE. This condition of trees is frequently met with, and often attended with serious consequences. With Apple and Pear trees a Bruise may be given to the branches by tools when working amongst them, thus making them susceptible to the spores of several wound-fungi. With stone-fruit trees a wound is often made when nailing, such a Bruise often inducing "gumming" in Peaches, Nectarines, and also in Plums. It is also probable that the mysterious death of branches in Apricots may be attributed to a similar cause.

BRUNELLA. The correct name of **Prunella** (which *see*).

BRUNFELSIA. ORD. *Solanaceæ.* About a score species, natives of South America and the West Indies, are included in this genus. To those described on pp. 216-7, Vol. I., the following should be added:

B. calycina grandiflora (large-flowered). A fine variety, with larger flowers than in the type. 1891.

B. Hopeana (Hope's). *fl.*, calyx longer than the pedicel, and having five blunt teeth; corolla blue with a yellow throat, the tube very little longer than the calyx. *l.* 1in. to 1¼in. long, elliptic, shortly petiolate. *h.* 1ft. West Indies, 1828. SYN. *Franciscea Hopeana* (B. M. 2829).

B. jamaicensis (Jamaica). *fl.*, corolla yellow, 2in. to 2½in. in diameter, the tube 3in. to 3½in. long (twice as long as the limb), straightish. June. *l.* lanceolate-oblong, bluntly pointed, membranous, at length 3in. to 6in. long, petiolate, veiny. Branchlets puberulous. *h.* 5ft. West Indies, 1844. (B. M. 4237, under name of *B. nitida jamaicensis.*)

BRUNISSURE. *See* **Browning.**

BRUNNICHIA (named in honour of Brunnich, a Danish botanist). SYN. *Rajania.* ORD. *Polygonaceæ.* A monotypic genus. The species, *B. cirrhosa*, is a greenhouse, climbing shrub, with pink flowers in axillary and terminal racemes, and alternate, ovate leaves. It has been introduced, but is probably lost to cultivation.

BRUNSVIGIA. This genus embraces nine species. Flowers copiously umbellate; perianth erect or slightly curved, the tube short. To the information given on p. 216, Vol. I., the following should be added:

B. ciliaris. The correct name is *Buphane ciliaris.*

B. falcata is a synonym of *Ammocharis falcata.*

B. gigantea (gigantic). The correct name of *B. multiflora.* SYN. *B. orientalis.*

B. humilis (dwarf). A synonym of *B. minor.*

B. magnifica (magnificent). *fl.* twenty to thirty in an umbel; perianth tube short, the segments white, with a broad, reddish-purple, central stripe, lanceolate-oblong, reflexed, 3½in. long; peduncle brown, 4in. long. *l.* oblong, deeply channelled acuminate, serrated, 1½ft. to 1¾ft. long, 3½in. broad, recumbent.

Brunsvigia—*continued.*

Bulb large, globose. 1885. (I. H. 1885, 552.) This "is a *Crinum*, either identical with *Forbesianum* or near it" (J. G. Baker).

B. Massaiana (Duc de Massa's). A synonym of *Crinum Massaiana.*

B. minor (lesser). *fl.* twelve to forty in an umbel; perianth pale red, 1¼in. to 1½in. long, the tube very short, the segments lanceolate; stamens as long as the segments; peduncle stout, 6in. to 9in. long. July. *l.* three or four, lorate, 6in. long, 1in. broad. Bulb ovoid, 2in. to 3in. in diameter. 1822. (B. R. 954.) SYN. *B. humilis.*

B. orientalis (Oriental). A synonym of *B. gigantea.*

B. toxicaria. The correct name is *Buphane disticha.*

BRUSSELS SPROUTS. For a general crop, Veitch's Paragon is one of the best, as it produces an abundance of firm, medium-sized sprouts. Other good varieties of the same class are Rosebery, Reading Exhibition, The Bullet, and The Wroxton. Sorts producing very large sprouts are President Carnot and Mein's Victoria.

BRYANTHUS. Three species, natives of the mountains of western North America, are included in this genus. To those described on p. 218, Vol. I., the following should be added. *B. erectus* is a hybrid.

B. Brewerl (Brewer's). *fl.* rose-purple, comparatively large, disposed in short racemes; corolla almost saucer-shaped; pedicels at first shorter than the flowers. Summer. *l.* crowded, three to seven lines long, almost smooth, with strongly revolute, thickened margins. *h.* 9in. to 12in. 1896. A charming little evergreen.

BRYOBIA PRETIOSA. *See* **Gooseberry Mite.**

BRYOBIA PRUNI. *See* **Damson Mite.**

BRYONIA. Including *Bryonopsis.* About a dozen species are included in this genus.

BRYONOPSIS. Included under **Bryonia** (which *see*).

BRYOPHYLLUM. SYN. *Physocalycium.* This genus includes four species of stove, fleshy herbs, shrubby at base, natives of tropical Africa, one being broadly dispersed over the tropical regions of both hemispheres. Flowers white, greenish, or red, rather large, nodding, disposed in many-flowered, paniculate cymes; calyx inflated, cylindrical or quadrangular, shortly five-cleft; corolla urceolate or almost campanulate, the limb shortly five-cleft, spreading; stamens eight, in two series. Leaves opposite, petiolate, simple or imparipinnate, crenate. To the species described on p. 218, Vol. I., the following should be added:

B. proliferum (proliferous). *fl.* 1¼in. long, drooping; calyx large, inflated; corolla longer than the calyx, greenish-yellow, tipped with pink; cymes terminal, proliferous. June. *l.* 1ft. to 1½ft. long, opposite, imparipinnate, with about five opposite pairs of sessile leaflets. Stem 10ft. to 12ft. high, moderately branched. Madagascar, 1858. (B. M. 5417.)

BUBANIA. A synonym of **Limoniastrum** (which *see*).

BUBON (of Linnæus). Included under **Seseli** (which *see*).

BUBROMA. A synonym of **Guazuma** (which *see*).

BUCCO CRENATA. A synonym of **Barosma crenulata** (which *see*).

BUCEPHALON. A synonym of **Trophis** (which *see*).

BUCERAS. Included under **Terminalia** (which *see*).

BUCHINGERA. A synonym of **Cuscuta** (which *see.*)

BUCHNERA VISCOSA. A synonym of **Sphenandra viscosa** (which *see*).

BUCHOSIA. A synonym of **Heteranthera** (which *see*).

BUCKEYE. *See* **Pavia.**

BUCKLER FERN. *See* **Aspidium.**

BUCKLEYA (a commemorative name). SYNS. *Nestronia, Quadriala.* ORD. *Santalaceæ.* A small genus (two or three species) of tall, branched, hardy shrubs, of which one is Japanese, and the other one or two are North American. Flowers dicœcious, the males umbellate and bractless, the females solitary and furnished with four bracts. Fruit ovoid or oblong. Leaves opposite or rarely scattered, shortly petiolate, acuminate, entire, penniveined. *B. distichophylla*, the only species introduced, is one of the rarest of North American plants; it thrives in ordinary soil, and may be increased by cuttings.

B. distichophylla (distichous-leaved). *fl.* greenish, and, as well as the fruit, inconspicuous. *l.* thin, light green, 1in. to 1½in. long, scarcely petiolate, nearly opposite, distichous, lanceolate, acute, pubescent. Branches slender, gracefully spreading. *h.* 6ft. to 12ft. North America, 1890. (G. & F. iii., p. 237, f. 37.)

BUD. *See* **Buds (Flower and Leaf).**

BUDDING. Vines that are deficient in spurs, or strong, healthy ones of poor flavour, may rapidly be improved by means of Buds of the same, or of better varieties being Budded upon them. Taking those that have long bare stems, Buds may be inserted wherever a spur is needed, employing the same variety. The best time for the operation is immediately prior to starting the Vines into growth, taking a Bud with wood attached, as in the ordinary Vine-eye, for propagation. On the opposite side to the eye, about half of the wood is cut away, or in other words to the pith. A corresponding piece of the bark is cut from the Vine-rod, and the Bud is fitted to the cut thus made, taking care that the bark of the Bud and that of the Vine-rod are exactly opposite and close together on one if not on both sides. After tying the Bud firmly in place, the whole, except the eye of the Bud, should be covered with damp moss, keeping this damp daily until the Bud has commenced to grow freely and the union is complete. By this means Vines may not only be made to have plenty of spurs, but worthless sorts rapidly changed into good ones with little trouble or expense.

BUDDLEIA. SYN. *Romana.* This genus embraces about seventy species, natives of South Africa and the warmer parts of America and Asia. To those described on p. 221, Vol. I., the following should be added:

B. auriculata (eared). *fl.* cream-coloured, ¼in. long; cymes many-flowered, shortly pedunculate; thyrse shorter than the leaves. *l.* lanceolate-oblong or ovate-lanceolate, 2in. to 3in. long, entire or serrated, narrowed at base, at length glabrous and shining above. South Africa. Plant tomentose. Greenhouse. (G. C. 1881, xvi., p. 633.)

B. brasiliensis (Brazilian). *fl.* orange, in a dense spike interrupted at base; calyx densely tomentose. *l.* ovate or deltoid-oblong, 6in. long, slightly acute, crenate, narrowed at base and broadly auriculate-connate. Stems somewhat winged and tetragonal. *h.* 10ft. Brazil, 1822. Plant woolly or ferruginously tomentose. (B. M. 2713.)

B. capitata (headed). A synonym of *B. globosa.*

B. carnea (fleshy). A synonym of *B. curviflora.*

B. Colvilei (Sir James Colvile's). *fl.* rose-coloured, with a white ring round the mouth of the corolla, bell-shaped, 1in. to 1¼in. across, disposed in shortly peduncled, thyrsiform, pendulous panicles 1ft. to 1½ft. long. June to August. *l.* 5in. to 7in. long, elliptic-lanceolate, acuminate, crenate-serrulate, shortly petiolate. Sikkim Himalaya. A beautiful, half-hardy shrub or small tree. (B. M. 7449; G. C. 1892, xii., p. 186; Gn., 1893, p. 482; I. H., ser. vi., t. 10; I. H. Pl. t. 18; J. H. S. ser. iii., vol. xxxi., p. 85; R. H. 1893, p. 520.)

B. connata (connate). *fl.* orange, very similar to those of *B. globosa*; heads globose, densely many-flowered, long-pedunculate. May. *l.* oblong-elliptic or almost lanceolate, acuminate, serrated, narrowed and auriculate-connate at base, glabrous above. *h.* 5ft. Peru, 1826. (B. M. 2853.)

B. curviflora (curved-flowered). *fl.* lilac or rosy-violet, ½in. long, ventricose-incurved above the middle; cymes many-flowered; thyrse 6in. to 8in. long, loose. *l.* petiolate, ovate or ovate-lanceolate, 3in. to 5in. long, 1½in. to 2in. broad, long-pointed, cuneate at base, glabrous above. Loo Choo Islands, 1870. Plant tomentose. Hardy. SYN. *A. carnea* (R. H. 1879, p. 90).

B. curviflora (of gardens). A synonym of *B. japonica.*

B. heterophylla (variable-leaved). A synonym of *B. madagascariensis.*

Buddleia—*continued.*

B. insignis (remarkable). *fl.* reddish-lilac, in compact spikes, simple, solitary or fascicled at the tips of the branches. *l.* caducous, opposite or ternate, narrow. A hardy or half-hardy shrub, in habit resembling *Veronica incisa*; it was raised from seeds in 1876. (R. H. 1878, p. 320.)

B. intermedia (intermediate). *fl.* lilac, with a white eye, in simple, drooping spikes as much as 1½ft. long. Summer and autumn. *l.* few, small, coriaceous, very dark green above, glaucescent beneath, narrowed, acute. 1873. A bushy, half-hardy shrub, with slender, recumbent branches. Garden hybrid. (R. H. 1873, p. 150.)

B. japonica (Japanese). *fl.* pale lilac, small, in very dense, arcuate spikes, succeeded by a profusion of fruit. May to August. *l.* elliptic, soft, attaining 10in. in. length and 1½in. to 2½in. in breadth, attenuated to an obtuse point. *h.* 6ft. Loo Choo. Hardy. SYN. *B. curviflora* (of gardens).

B. madagascariensis (Madagascar). *fl.* of a beautiful yellow, in loose cymes, pedunculate and forming a thyrse from 6in. to 12in. long. June to August. *l.* oval, lanceolate, or somewhat cordate, entire or slightly toothed, rough above, ferruginous beneath. *h.* 3ft. to 6ft. Madagascar, 1824. (B. M. 2824.) SYN. *B. heterophylla* (B. R. 1259).

B. pulchella (pretty). *fl.* yellowish-white, tubular, small, disposed in short, terminal panicles. *l.* hastate or irregularly lobed, about 2in. long. *h.* 2ft. Probably South Africa, 1894. A compact, greenhouse bush, quite unlike any other species.

B. variabilis (variable). *fl.* lilac, densely crowded in large, globose heads, which are pedunculate in the upper axils, or collected into erect thryses 4in. to 6in. long; corolla tube ¼in. long. July and August. *l.* opposite, 4in. to 12in. long, oblong or lanceolate, obtuse or caudate. China, 1896. A tall, hardy shrub. (B. M. 7609.)

BUEKIA. A synonym of **Alpinia** (which *see*).

BUENA. A synonym of **Cosmibuena** (which *see*).

BUETTNERIA. SYNS. *Buttneria* and *Byttneria.* *Pentaceros* is included in this genus.

BUFFALO CLOVER. *See* **Trifolium reflexum.**

BUFFALO CURRANT. *See* **Ribes aureum.**

BUFFALO NUT. *See* **Pyrularia oleifera.**

BUFF-TIP MOTH. This handsome Moth, described in Vol. I., is a fairly omnivorous feeder. For Limes, Oaks, Alders, Beech, Birch, Willows, Wych and other Elms, the caterpillars have a marked partiality; but they do not disdain to attack fruit trees, and less often Rose trees. They are gregarious and very

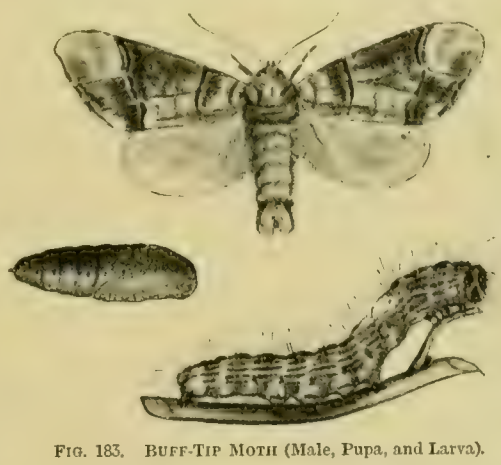


FIG. 183. BUFF-TIP MOTH (Male, Pupa, and Larva).

voracious, and will quickly defoliate a tree. The Moth is nocturnal, and seldom noticed upon the wing; and even when at rest upon a tree-trunk it is most difficult to differentiate. In fact, it more closely approximates to a piece of stick whose end has been obliquely cut off than to a Moth. The caterpillars, feeding as they do in companies, should readily be destroyed. Perfect insect (male), pupa, and larva, are shown at Fig. 183.

BUFO VULGARIS. *See* **Toad.**

BUGINVILLÆA. *See* **Bougainvillæa.**

BUGLE LILY. *See* **Watsonia.**

BUISSON. A name given to a dwarf fruit tree on a low stem, this being closely pruned annually. It is not, however, a profitable form of tree.

BULB. *See* **Bulbs.**

BULB BACTERIOSIS. *See* **Bacteriosis.**

BULBIL. A very small or secondary bulb, especially when produced above the ground, as in some Ferns and Lilies.

BULBINE MACKENII. A synonym of **Eriospermum Mackenii** (which *see*).

BULBINELLA. The correct name of **Chrysobactron** (which *see*).

BULB MITE. *See* **Eucharis Mite.**

BULBOCODIUM AUTUMNALE. A synonym of **Merendera Bulbocodium** (which *see*).

BULBOPHYLLUM. SYNS. *Diphyes* and *Gersinia*. Including *Malachadenia*. Of this genus there are about eighty species, mostly dispersed through tropical Africa and Asia; a few are South American or Australian, and one is found in New Zealand. Pseudo-bulbs usually bearing one or two leaves at apex. To the species described on p. 222, Vol. I., the following should be added:

B. anceps (two-edged). *fl.* moderate-sized; dorsal sepal and petals yellowish, dotted with purple; lateral sepals white, striped with purple; lip purple; racemes lax. *l.* oblong, obtuse. Pseudo-bulbs very broad, compressed. Borneo, 1892. An elegant species. (L. viii., t. 351.)

B. attenuatum (attenuated). *fl.* veined and suffused with maroon-purple on a lighter ground, few; sepals caudate, 1in. to 1¼in. long; lip caudate, ⅜in. long; scape 9in. long, slender, floriferous at apex. October. Borneo, 1892.

B. auricomum (golden-haired).* *fl.* pure white or yellow, sweet-scented; sepals ¼in. long; petals ciliated; raceme 3in. to 6in. long, many-flowered, puberulous; scapes slender, ascending. January. *l.* deciduous. Pseudo-bulbs ⅜in. to 1in. long, sub-cylindric, terete, or obpyriform. India, 1897.

B. barbigerum. An interesting species, whose flower-spikes spring from the base of the pseudo-bulbs. (See Fig. 184.)

B. calamarium (quill-like). *fl.* dirty ochreous-yellow, with a little purple; sepals nearly ½in. long; petals ¼in. long; lip purple, ⅛in. long; racemes 4in. to 6in. long, many-flowered; scapes erect, 1½ft. to 1¾ft. long. *l.* oblong, 6in. to 7½in. long. Psuedo-bulbs quadrangular, 1½in. long, one-leaved. Upper Guinea, 1844. (B. M. 4088.)

B. comosum (tufted). *fl.* white, ⅜in. long, densely villous, perfectly horizontal; racemes inclined, cylindric, truncate, 2½in. by 1½in., resembling a bottle-brush; scape 10in. long, curved. *l.* fleshy, deciduous. Pseudo-bulbs clustered, Pleione-like. Birma, 1892. (B. M. 7283; J. H. 1892, xxiv., p. 141, f. 21.)

B. cupreum (copper-coloured). *fl.* of a uniform copper-yellow; raceme 1in. to 2in. long; scape slender, inclined, slightly curved; sheaths small. Pseudo-bulbs 1in. long, sub-globose. Tenasserim, 1837. (B. M. 5316.)

B. Dayanum (Day's).* *fl.* 1in. in diameter, ciliated with long hairs; sepals green, with purple specks; petals blood-red, with yellow margins; lip green, with red ridges on the disk; scape wanting. *l.* 3in. long, elliptic, reddish beneath. Pseudo-bulbs 1in. long, crowded. Tenasserim, 1855. (B. M. 6119; F. d. S. 2236; Ref. B. 115; R. X. O., ii., t. 144.)

B. Dearei (Lt.-Col. Deare's).* *fl.* about 3in. in diameter; dorsal sepal yellow, with deep orange veins, the lateral ones yellow, suffused with purple; petals clear yellow, veined with deep orange; lip creamy-white, spotted with purple at the base. *l.* small. Pseudo-bulbs ovate, 2in. long. Borneo and Philippines. 1883. (G. C. 1883, xx., p. 108, f. 17; J. H. 1892, xxiv., p. 237, f. 38; L. viii., t. 108.) SYN. *Sarcopodium Dearei*.

B. denticulatum (slightly-toothed). *fl.* small; raceme somewhat deflexed, 1½in. to 1¾in. long, many-flowered; scape slender, 5in. to 6in. long. *l.* linear-oblong, 3in. to 3½in. long. Pseudo-bulbs somewhat distant, ovoid-tetragonal, 1¼in. long, two-leaved. Upper Guinea, 1891.

B. disciflorum (disc-flowered). *fl.* fleshy, 1in. across; sepals and petals greenish-yellow, spotted with reddish-brown; lip covered with purplish-brown warts; scape short, one-flowered. Pseudo-bulbs crowded, ovoid, small, one-leaved. Siam, 1895.

B. elegans (elegant). *fl.* 1in. to 1½in. long; sepals rosy-purple, broad, the upper one shorter and paler than the lateral ones;

Bulbophyllum *continued.*

scapes slender, one-flowered, 1in. to 2in. long. *l.* 3in. to 4in. long, linear-lanceolate. Pseudo-bulbs ½in. to ¾in. long, ovoid, closely set. Ceylon, 1892.

B. Ericssoni (Ericsson's). *fl.* yellowish-white, spotted with brown, 9in. across including the tails, umbellate. *l.* like those of a Stanhopea. Pseudo-bulbs thin, erect, 5in. high. Rhizome long, creeping. Habitat not recorded, 1893. A very striking species.

B. fallax (deceptive). *fl.* dark purple, small; scape 8in. long, bent acutely in the middle. Assam, 1889. An elegant little species.

B. Godseffianum (Godseff's). *fl.* 2in. across; sepals and petals yellow and brown; lip creamy-white, with purple spots, cordate. Habitat not recorded, 1890. Closely allied to *B. Dearei*. SYN. *Sarcopodium Godseffianum* (G. M. 1890, ii., p. 540

FIG. 184. BULBOPHYLLUM BARBIGERUM.

B. grandiflorum (large-flowered). *fl.* solitary, large, densely reticulated with brown on a pale ground; sepals lanceolate-attenuate, 4in. to 5in. long, free, the upper one twice as broad as the lateral ones, strongly arching over at the base, and hanging down in front. *l.* solitary, elliptic, 2½in. to 3in. long. Pseudo-bulbs about 1in. long, distant, four-angled. Rhizome creeping. New Guinea, 1887. More grotesque than beautiful. (L. iii., t. 108.)

B. g. burfordiense (Burford). *fl.*, dorsal sepal green, shaded and mottled at base with greenish-brown, and with large white dots; lateral sepals pale green, olive-tinted at apex. 1895. An extraordinary Orchid.

B. Hookerianum (Hooker's). A synonym of *B. Oreonastes*.

B. inflatum (inflated). *fl.* greenish-yellow, small; sepals ¼in. across; lip recurved; racemes 1in. to 1½in. long, the rachis swollen into an ellipsoid, fleshy body; scapes pendulous, 2in. long. *l.* sessile, lanceolate-oblong, acuminate, 3in. to 4in. long. Pseudo-bulbs strongly quadrangular, 1in. long, one-leaved. Upper Guinea, 1891.

Bulbophyllum—*continued.*

B. lemniscatoides (*lemniscatum*-like). This differs from *B. lemniscatum* only in habit and in the structure of the appendages of the sepals. Java, 1890.

B. lemniscatum (ribboned).* *fl.* small, crowded on a pendulous spike at the end of the scape; sepals dark purple, setose, with an appendage at the base; petals white, with a purple streak; scapes slender, 4in. to 6in. high. *l.* three or four from the base of the pseudo-bulb, 1½in. to 2in. long, elliptic-lanceolate. Pseudo-bulbs ½in. to ¾in. in diameter. Moulmein, 1872. A remarkable species. (B. M. 5921; F. d. S. 2476.)

B. Leysianum (Leys'). *fl.* large, solitary; dorsal sepal yellow, veined with purple, the lateral ones pink and purple, connate. Borneo, 1894. Closely allied to *B. Dearei.*

B. Lobbii siamense (Siamese). The correct name of *B. siamense.* (Ref. B. 116.)

B. longiscapum (long-scaped). *fl.* about 1in. across; sepals and petals pale green; lip reddish-purple; scapes upwards of 1ft. in length. *l.* linear-oblong. Pseudo-bulbs ovoid, ½in. long. Fiji, 1896.

B. macranthum (large-flowered). *fl.* at first of a vinous-red, the dorsal sepal and petals becoming dull blue-purple with broad spots of a dark blue, and the lateral sepals yellowish speckled with bright red on the outer half, large, spreading. March. *l.* shortly petiolate, linear-oblong, thick, coriaceous. Birma, &c., 1844. (B. M. 7203; B. R. 1844, f. 13.)

B. mandibulare (mandible-like). *fl.*, sepals deep bronzy green; petals dark reddish-brown, striped with green; lip yellow and deep reddish-brown. Borneo, 1894. A large and curious species.

B. Medusæ (Medusa's). The correct name of *Cirrhopetalum Medusæ.*

B. neilgherrense (Nilghiri Hills). *fl.* brownish-yellow or green and purple; lateral sepals oblong; auricles of the lip entire or toothed; racemes lax-flowered; scape stout, elongated. January. Nilghiri Hills, 1849. (B. M. 5050.)

B. nigripetalum (black-petaled). *fl.* yellowish and purplish-black; sepals five lines long; lip densely pilose; raceme 3½in. long, many-flowered; scape sub-erect, 1½ft. long. *l.* elliptical-oblong, 4in. to 5in. long. Pseudo-bulbs ovoid-tetragonal, 1½in. to 1½in. long, one-leaved. Lower Guinea, 1891.

B. Obrienianum (O'Brien's). *fl.* yellow, with dark reddish-purple spots, solitary, nearly 2in. in diameter. Pseudo-bulbs ovoid, one-leaved. Rhizome stout. Himalayas, 1892.

B. Oreonastes (Oreonastes). *fl.* yellow, very small; racemes 1½in. to 2in. long; scapes sub-erect, arching, 2½in. to 4in. long. *l.* oblong, 1½in. to 1½in. long, shortly petiolate. Pseudo-bulbs quadrangular, ¾in. long, two-leaved. Upper Guinea, 1894. SYN. *B. Hookerianum.*

B. orthoglossum (straight-lipped). *fl.*, sepals and petals yellowish-green, striped with brown; lip purple. Sarranga Island, 1896. Allied to *B. mandibulare*, but having flowers only about half as large.

B. oxyodon (sharply-toothed). A synonym of *Megaclinium oxyodon.*

B. pavimentatum (tessellated). *fl.* reddish-purple, very minute; racemes dense, 1½in. to 2in. long; scapes slender, 4in. to 6in. long. *l.* oblong or elliptic-oblong, 2½in. to 4in. long. Pseudo-bulbs ovoid, one-leaved. Upper Guinea, 1862. (B. M. 5329.)

B. Pechei (George Peché's). *fl.* coppery-red, rather densely disposed in an elongated raceme; scape decurved, longer than the pseudo-bulbs. January. *l.* linear-oblong or lanceolate, obtuse, slightly dotted beneath. Pseudo-bulbs ovoid, angular. Moulmein, 1891. (B. M. 7286.)

B. perpusillum (very small). One of the smallest species. "The creeping stems are thinner than ordinary silk thread; the bulbs and leaves are one to two lines in length, and the leaves are about half a line in breadth." Madagascar, 1894.

B. pteriphilum (Fern-loving). *fl.* white, small, distichous, numerous on a scape 4in. long. *l.* linear-oblong. Pseudo-bulbs small, oblong. Rhizomes elongated. Penang, 1894.

B. ptiliglossum (fringe-lipped). A species allied to *B. barbigerum*, from which it differs chiefly in having green and purple flowers with hornless anthers and purplish hairs covering the margins of the distinctly lobed lip. Madagascar, 1897.

B. racemosum (racemose). *fl.* ¾in. long; sepals and petals yellowish, spotted with maroon; lip purple, with black dots near the tip; scape 6in. long. *l.* coriaceous, linear-oblong, 4½in. long. Pseudo-bulbs sub-orbicular, 1in. long, one-leaved. Borneo, 1893. Allied to *B. anceps.*

B. rufinum (reddish). *fl.* of a dirty yellow with red streaks on the sepals; raceme 6in. to 10in. long, lax-flowered; scape long, stout, decurved; sheaths large. Pseudo-bulbs 2in. long, oblong. India. (R. X. O. iii., t. 219.)

B. Sanderianum (Sander's). *fl.* pale green, spotted and marked with purple; sepals ½in. long; column white; scape 1½ft. long. July. *l.* 2½in. long, sessile, elliptic-oblong, fleshy. Pseudo-bulbs ¾in. to 1in. long, one-leaved. Pernambuco.

B. saurocephalum (lizard's-head). *fl.* very curious; sepals light ochreous, nerved brown; petals white, with reddish

Bulbophyllum—*continued.*

mid-line and borders, small; lip ochreous, deep purple at base; rachis bright red, thick, clavate, loaded with flowers. Pseudo-bulbs four- or five-angled, one-leaved. Philippine Islands, 1886. An interesting species.

B. siamense is a variety of *B. Lobbii.*

B. Sillemianum (Sillem's). *fl.*, sepals short, blunt, triangular; petals nearly orange, shorter, ligulate-falcate; lip mauve above, whitish beneath, cordate at base, five-angled, with a reflexed apex; column very short. *l.* cuneate-ligulate, acute. Pseudo-bulbs nearly spherical. Birma, 1884.

B. spathaceum (spathe-like). *fl.* light straw-colour; lip brighter; raceme denser; base of the inflorescence sheathed by spathaceous bracts. July. *l.* shorter. Otherwise like *B. apodum.* Birma, 1892.

B. spectabile (remarkable). *fl.* pale green, closely spotted in lines with deep brown; lateral sepals about 1in. long; lip stipitate, recurved, fleshy; scapes 2½in. long, one-flowered. May. Pseudo-bulbs ovoid, shining, ½in. to 1in. long, one-leaved. Assam, 1896.

B. suavissimum (sweetest). *fl.* primrose-yellow, with a golden lip, small, very sweet-scented, secund; raceme elongated, decurved; scape (with raceme) 8in. to 10in. long, very slender. *l.* 4in. long, narrowly oblanceolate. Pseudo-bulbs 1in. long, one-leaved. Upper Birma, 1889.

B. tremulum (trembling). *fl.* white, 1½in. in diameter, with reddish-purple lines and lip, the latter fringed with long hairs; raceme 6in. long, few-flowered. *l.* ovate-lanceolate, 2in. long. Pseudo-bulbs ovate, sub-globose, one-leaved. Nilghiri Hills, 1896.

B. umbellatum (umbellate). A synonym of *Cirrhopetalum guttulatum.*

B. vitiense (Fijian). *fl.* pale yellowish-white, the upper half of the sepals light pink; sepals ½in. long; raceme sub-erect, 6in. to 7in. long, many-flowered. August. *l.* 5in. to 7in. long, linear-oblong. Pseudo-bulbs 1in. to 1½in. long, tetragonal, one-leaved. Fiji, 1892.

The following species, &c., are rarely seen in cultivation, at Kew and elsewhere: *B. apodum, B. aurantiacum, B. bisetum, B. cæspitosum, B. capillipes, E. Careyanum, B. carinatum* (L. xi., t. 495), *B. clandestinum, B. cocoinum* (B. R. 1964), *B. conchiferum, B. cylindraceum, B. densiflorum, B. densum, B. Drallei, B. erectum, B. flavidum, B. fuscum, B. gibbosum, B. Hamelini, B. hirtum, B. intertextum, B. Johannis, B. lasianthum, B. leopardinum, B. Lobbii Henshalli, B. micranthum, B. minutissimum, B.occultum, B. odoratissimum, B. pachyrhachis, B. psittacoglossum, B. purpureum, B. radiatum, B. recurvum, B. Shepherdi, B. striatum, B. tuberculatum, B. variegatum, B. viride,* and *B. Watsonianum.*

BULBOSPERMUM. A synonym of **Peliosanthes** (which *see*).

BULBOSTYLES. The species of this genus are now included under **Eupatorium** and **Brickellia** (which *see*).

BULBS, as popularly understood, furnish some of the most useful and decorative of plants alike for indoor and outdoor gardens. They are amongst the first to flower in spring, and remain with us practically all through winter in specially favoured sites and soils—*Iris stylosa, I. reticulata,* several species of winter Crocuses, and a few others. For the greenhouse and conservatory Bulbs are absolutely indispensable, and the fragrant snow-white Roman Hyacinths are available as cut flowers from November onwards. The window-gardener, again, has in Bulbs the most effective of all early floral subjects. Amongst Bulbs are to be found the loveliest blues that any plants afford—Chionodoxa, Scilla, Hyacinth, Spanish Iris, English Iris, and Muscari. In height Bulbs vary greatly from those of a few inches, which are suited to the rockery, to the giant Eremuruses, all too seldom seen.

The culture of the more popular kinds of Bulbs is of the easiest. The chief mistakes made are in unduly delaying the planting-time, in treating the soil to crude manures, and in the depth at which the Bulbs are actually planted. The majority of Bulbous plants whose culture is undertaken by amateurs are planted far too late. This is especially the case with Narcissus, Crocuses, and Snowdrops. The first-named, if possible, should be in the soil in late August, and the others at the beginning of September. Plenty of roots are then made early, and unless roots are made leaves rather than flowers will be produced. Some Bulbs

Bulbs—*continued.*

quickly deteriorate when kept out of the soil and exposed to dry, cutting winds—Lilies, for instance. Hyacinths and Tulips may be inserted later than most Bulbs. There are also some kinds which are better planted in spring—those which are not sufficiently hardy to be kept outside the year round. Bulbs, generally, should be planted at twice their depth, a little under if anything: one which is, say 2in. in height, should be planted at a depth of 4in. Care should also be taken to maintain as far as possible a uniform depth in planting. A very large proportion flourish best in a light sandy soil, with which has been worked some well-rotted manure. The soil at the time of planting should always be in a nice friable condition: a pasty soil is fatal to the chances of good flowers.

Bulbs may be propagated in various ways. For the amateur gardener propagation by seed cannot be recommended. The time occupied from the period of sowing to that of flowering varies with different genera from two to five or six years. The most popular method of propagation is by means of the young Bulbs which push out from the axils of the scales of the parents, or, in certain cases (Crocuses, for instance), from the axils of scale leaves, when the parent gradually decays.

The number of ways in which Bulbs may be utilised to advantage is great. One form is that of planting certain species on lawns or upon grassy banks. This natural method has much to recommend it, and it has found favour in many of our best public gardens, including Kew. For beds and borders, rockeries, and planting in the shrubberies, Bulbs are eminently adapted, and where brilliant colour-effect is aimed at the brightest should be planted liberally.

For outside culture the following Bulbs should be represented: *Allium Moly*, Snowdrop, Scilla, Snowflake, Snakeshead, Crown Imperial, Madonna Lily, Tiger Lily, Wood Hyacinth, Florists' Hyacinths, *Hyacinthus azureus*, Narcissus, Crocus, Tulip (both florists' varieties and species like *Tulipa retroflexa*, *T. sylvestris*, *T. suaveolens*, and *T. Didieri*), *Milla* (*Triteleia*) *uniflora*, Grape Hyacinths, Spanish Iris, English Iris, Ornithogalum, Red Hot Pokers, Tiger Flowers, Glory of the Snow, and Flower of the West Wind.

Indoors, Narcissus Golden Spur, Bicolor Horsfieldii, and Pallidus Præcox, Roman Hyacinth, Chinese Sacred Lily, *Milla uniflora*, *Freesia refracta alba*, *Scilla sibirica*, and *Allium neapolitanum* may be used along with many others.

Good Bulbs for the rockery are to be found in Crocus species like *speciosus*, *asturicus*, and *sativus*; *Allium Moly* and *A. neapolitanum*; *Muscari conicum*; *Scilla sibirica* and *S. campanulata alba*; *Sternbergia lutea*; *Fritillaria Meleagris*, *F. armena*, and *F. aurea*; *Iris reticulata*; *Galanthus Ikariæ*; *Tulipa persica*; *Romulea speciosa*; *Leucojum vernum*; and *Bloomeria aurea*.

BULLIARDA. Included under **Tillæa** (which *see*).

BULÖWIA. A synonym of **Smeathmannia** (which *see*).

BULRUSH. *See* **Scirpus.**

BUMALDA. A synonym of **Staphylea** (which *see*).

BUNCHOSIA. About twenty-two species of tropical American trees and shrubs are included in this genus. In addition to the species described on p. 223, Vol. I., *B. elliptica* may be mentioned. It is a shrub or small tree, with broadly ovate green leaves, and prominent, curiously-curved nerves, and yellow flowers produced in the axils of the leaves.

BUNT OF WHEAT. Another name for Stinking Smut of Wheat (*Tilletia tritici*).

BUPHANE (a misprint, subsequently corrected by Herbert, for *Buphone*, from *bous*, an ox, and *phone*, destruction, in allusion to the poisonous properties of the plant; but *Buphane* is the name adopted by the authors of the "Genera Plantarum," and by Baker in his "Amaryllideæ"). Originally *Boophane*. Including *Crossyne*. ORD. *Amaryllideæ*. A small genus (two species) of greenhouse, bulbous plants, natives of tropical and South Africa. Flowers long-pedicellate, numerous in an umbel; perianth salver-shaped, with a short tube and equal, linear or lanceolate lobes; stamens inserted at the throat of the perianth-tube; involucral bracts two; scape solid. Leaves loriform, appearing late. For culture *see* **Brunsvigia.**

B. ciliaris (ciliated). The correct name of *Brunsvigia ciliaris*. SYN. *Crossyne ciliaris*.

B. disticha (two-ranked). Cape Poison Bulb. The correct name of *Brunsvigia toxicaria*. SYNS. *Amaryllis ciliaris*, *Hæmanthus toxicarius* (B. M. 1217).

BUPHTHALMUM. Including *Telekia*. Four species, natives of the mountainous regions of Central and Southern Europe, compose this genus. To those described on p. 223, Vol. I., the following should be added. *See also* **Odontospermum.**

B. cordifolium (cordate-leaved). A synonym of *B. speciosum*.

B. speciosum (showy). *fl.-heads* yellow, involucral scales ovate, mucronate. July. *l.* pubescent beneath; lower ones petiolate, cordate, doubly serrated; upper ones ovate, sessile, simply serrated. Stems erect, pubescent. Croatian Mountains, &c., 1739. A strongly-scented, showy perennial, forming bold masses, and suitable for shrubberies, &c. SYNS. *B. cordifolium*, *Telekia speciosa* (B. M. 3466).

BUPLEURUM. Buplever. Including *Tenoria* (of Sprengel). About sixty species, broadly dispersed, are included in this genus, four being indigenous in Britain.

BUPLEVER. *See* **Bupleurum.**

BUR, NEW ZEALAND. *See* **Acæna.**

BURCHARDIA (of Duhamel). A synonym of **Callicarpa** (which *see*).

BURGSDORFFIA. A synonym of **Sideritis** (which *see*).

BURLINGTONIA. According to Bentham and Hooker, this genus is regarded as synonymous with **Rodriguezia**, which comprises about twenty species, natives of tropical America, from Brazil as far as Central America. To those described on p. 225, Vol. I., the following should be added:

B. amœna (pleasing). A synonym of *B. decora*.

B. caloplectron (beautiful-spurred). A synonym of *Rodriguezia caloplectron*.

B. Farmeri (Farmer's). *fl.* white and yellow, freely produced. Early summer. Native country unknown. A pretty species, resembling *B. candida*. It should be grown on a block or in a basket with Sphagnum.

B. Knowlesii (Knowles'). *fl.* white, with a faint tinge of lilac-pink, disposed in long racemes. Autumn. Native country unknown. A scarce but beautiful species, resembling *B. venusta*.

B. pubescens (downy). The correct name is *Rodriguezia pubescens*. (L. 306.)

BURMANNIACEÆ. A natural order of annual or perennial herbs, inhabiting the warmer regions of the globe, and ranking between the *Hydrocharideæ* and the *Orchideæ*. The species are of botanical interest.

BURMESE ROSEWOOD. *See* **Pterocarpus indicus.**

BURNET ROSE. *See* **Rosa spinosissima.**

BURNEYA. A synonym of **Timonius** (which *see*).

BURNING OR SCORCHING OF VINES. The most prolific cause of Scorched foliage or berries in Grapes, is neglecting to open the ventilators early enough in the morning. While the foliage is young and tender, it is astonishing how quickly the damage may be done, and such can only be prevented by the most careful attention on the mornings of bright days by taking care to admit air gradually, so that no checks are given by a sudden

Burning or Scorching of Vines—*continued.*

inrush of cold air. Another factor is defective root-action. In such a case the most careful ventilation will fail to stop Scorching, as the foliage being thin, and lacking in substance, a powerful sun-heat almost invariably causes it to Burn, and the berries to scald. Again, the use of strong manures, highly charged with ammonia, will cause Scorching, especially if the vinery is closed entirely for a few days. To avoid any damage it is advisable to leave a little top ventilation day and night for a week or so, to enable the rank fumes to escape.

BURNT WOOD. *See* **Scolopendrium vulgare.**

BUROMA GUAZUMA. A synonym of **Guazuma ulmifolia** (which *see*).

BURRIELIA (in part). Synonymous with **Bæria** (which *see*).

BURSARIA. Two species, both natives of extra-tropical Australia, are included in this genus. Flowers whitish, rather small, in pyramidal panicles; sepals distinct; petals narrow, spreading nearly to the base; filaments subulate. Leaves small, often fascicled, entire.

BURSERA. Including *Icica* and *Protium*. This genus embraces about forty species, all tropical and mostly American.

BUSBECKIA. A synonym of **Salpichroa** (which *see*).

BUSH. A low and dense shrub.

BUSH HONEYSUCKLE. *See* **Diervilla.**

BUTOMOPSIS (from *Butomus*, an allied genus, and *opsis*, resemblance). SYN. *Tenagocharis.* ORD. *Alismaceæ.* A monotypic genus. The species, *B. lanceolata*, is a stove, annual, bog-loving herb, with milky juice, native of tropical Asia, Africa, and Australia. It bears an umbel of three to twenty white flowers, in bracteate whorls, and has elliptic, acute leaves. Probably it is no longer in cultivation.

BUTONICA SAMOENSIS. A synonym of **Barringtonia samoensis** (which *see*).

BUTTERFLY CYCLAMENS. These are a curious race of Cyclamens, for whose introduction M. de Langhe-Vervaene, of Brussels, is responsible. The plants are characterised by broad, wavy, reflexed petals, fringed at the margin. The usual colours are white, cream, violet, and lilac.

BUTTERFLY FLOWER. *See* **Schizanthus.**

BUTTER-ROOT. *See* **Pinguicula vulgaris.**

BUTTER-TREE, INDIAN. *See* **Bassia butyracea.**

BUTTNERIA. *See* **Buettneria.**

BUTTONS. *See* **Tanacetum vulgare.**

BUTTON WEED. *See* **Spermacoce.**

BUXEÆ. A tribe of **Euphorbiaceæ** (which *see*).

BUXUS. This genus comprises about nineteen species, mostly hardy; six are found in North temperate regions, one in Madagascar, another in tropical Africa, and the rest in the West Indies. To those described on p. 226, Vol. I., the following should be added:

B. chinensis (Chinese). A synonym of *Simmondsia californica.*

B. Fortunei (Fortune's). *l.* long, narrow, sub-cuneiform. Branches numerous, erect. China, 1870. A compact-growing, very hardy, evergreen shrub. SYN. *B. longifolia* (of gardens).

B. Harlandi (Dr. Harland's). *l.* almost sessile, narrow-obovate, emarginate at apex, ten to fifteen lines long. Branchlets pubescent. Hong Kong.

Buxus—*continued.*

B. japonica (Japanese). *l.* ¼in. long, obovate, emarginate at apex, acute at base. Japan.

B. j. microphylla (small-leaved). *l.* spathulate-lanceolate, thrice (or more) as long as broad. Japan.

B. longifolia (long-leaved). A garden synonym of *B. Fortunei.*

B. microphylla (small-leaved). A variety of *B. japonica.*

B. sempervirens. The following varieties may be added: *Handsworthi*, with broad, deep-coloured leaves; *rosmarinifolia*, with narrow leaves, the bush somewhat resembling a dwarf Rosemary; and *thymifolia*, with very small leaves and branches.

B. Wallichiana (Wallich's). *l.* 1¼in. to 2¼in. long, ¼in. to ½in. broad, linear-lanceolate, shortly narrowed at base, truncate or emarginate at apex, slightly mucronulate. India.

BYBLIS (a classical name; Byblis was the daughter of Miletus). ORD. *Droseraceæ.* A genus embracing three or four species of greenhouse herbs, all Australian. Flowers blue, small or large, axillary and long-pedunculate or borne on a scape; calyx five-parted; petals five; stamens five, inserted or free. Leaves clustered, alternate, narrow-linear, terete or filiform; vernation circinate. *B. liniflora* has been introduced, but is probably not now in cultivation.

BYRSONIMA. About ninety species of stove trees or shrubs (often climbing), natives of tropical America, are included in this genus. Calyx five-parted; petals having a reflexed claw and a concave limb; stamens ten, all perfect. Leaves entire, without glands, the stipules often connate in an axillary one, rarely bifid or free.

BYTTNERIA. *See* **Buettneria.**

CABALLERIA. A synonym of **Myrsine** (which *see*).

CABBAGE. For sowing in July or August the following sorts are the best, being reliable, early, and not prone to run to seed in spring: Veitch's Earliest, Best of All, Ellam's Dwarf Early Spring, Mein's No. 1, and Nonpareil Improved. For summer use, any or all of the above are excellent, together with Enfield Market, Early York (referred to in Vol. I.), and Large York. An excellent variety for autumn and early winter use is Chou de Burghley, being of fine flavour and good constitution. For latest supplies Christmas Drumhead will be found the best. In Pickling Cabbage, Red Dutch is still one of the best; Improved Blood should also be grown. The White Cabbages also pickle well, and if sliced Beetroot is mixed therewith a nice red colour is obtained.

CABBAGE CATERPILLARS. To the insects enumerated under this heading in Vol. I. should be added the Caterpillars of the Green-veined White Butterfly (*Pieris napi*, Fig. 185), another common species found upon various *Cruciferæ*, including Cabbages and Watercress. Doubtless, however, it is mistaken by gardeners for the Small White, and is therefore less often recorded as a pest than either *P. brassicæ* or *P. rapæ*. *P. napi* differs chiefly from *P. rapæ* in having green markings along the nervures. This feature, however, varies considerably. The Butterfly, like its relatives already noted, is double-brooded, appearing in April and in July. The larva is green, dotted with black. There is a lateral yellow spot in each segment; the spiracles are black. The pupa is light green, with yellow points, and marked with brown.

Though all three species named feed upon Cabbages, as ordinarily understood, yet they also lay under contribution Broccoli, Cauliflowers, Kales, Turnips, Rape, and Mustard. Nor is it only the leaves of these plants that are destroyed: the seeds and seed-pods of Mustard are frequently attacked. All the species are most plentiful, and therefore correspondingly destructive, in dry weather. In certain seasons, too, the numbers of *P. brassicæ* are reinforced by swarms from the Continent.

Cabbage Caterpillars—*continued*

Patches of Cabbages should be watched in early summer, and hand-picked as far as possible. This, however, is only applicable to comparatively small gardens. The plants should also be dusted with a mixture of lime and soot, in nearly equal parts, the former preponderating. All cruciferous weeds should be removed from gardens and burned. The gardener should also look well for the chrysalides in the positions already indicated, and destroy any found. He is materially assisted in keeping all the above Cabbage Caterpillars at bay by insectivorous birds. Still

FIG. 185. MALE, FEMALE, CATERPILLAR, AND CHRYSALIS OF GREEN-VEINED WHITE BUTTERFLY (*Pieris napi*).

greater assistance, however, is given by certain hymenopterous parasites, whose larvæ live parasitically in the bodies of the larvæ and pupæ of these *Pieridæ*. The parasitic larvæ subsist upon the lymph of their unfortunate host, which, after a time, usually sickens and dies, and the yellow cocoons of the ichneumon-fly are laid upon both larvæ and pupæ of "White" Butterflies. These cocoons should never be removed. *Apanteles glomeratus* is one of the most useful hymenopterous parasites in keeping these Butterflies in check.

CABBAGE GALL WEEVIL (*Ceuthorrhynchus sulcicollis*). The eggs of this very common Beetle are deposited in early summer, and the grubs hatch out in about ten days. They at once set to work, and galls of about the size of Hazel-nuts are eventually formed. When full-fed, the grubs pupate in the soil, or it may be in the roots of the attacked plant. Many preparations have been advocated (of which gas-lime is very effective if applied before the grubs have had time to ensconce themselves in the roots), but preventive as well as remedial measures must be adopted if thorough success is to be attained. Collectors of Beetles know that the

Cabbage Gall Weevil—*continued*.

Cabbage Gall Weevils are to be found early in the season in Charlock. This should always be removed and burnt when in the neighbourhood of Turnip and Cabbage crops. All Cabbage stumps should also be similarly served instead of being consigned to the rubbish-heap, as is usually done. *See also* **Turnip Galls**, Vol. IV.

CABBAGE PALMETTO. *See* **Sabal Palmetto.**

CABBAGE ROSE. *See* **Rosa centifolia.**

CABBAGE-TREE. This name is applied to **Andira inermis** as well as **Euterpe oleracea.**

CABBAGING. Another name for **Heading** or **Hearting** (which *see*).

CABOMBA. The two or three species composing this genus are all American. Flowers white or yellowish, small, on long, solitary, axillary pedicels; sepals three, petaloid; petals three, hypogynous; stamens six. Submerged leaves palmately dissected; floating ones peltate.

CACABUS (from *kakabos*, a red earthen pot; with the prefix *hali*, this name was originally applied to *Physalis Alkekengi*, in reference to the red inflated calyx). SYNS. *Dictyocalyx*, *Streptostigma*, *Thinogeton*. ORD. *Solanaceæ*. A genus embracing about five species of diffuse, prostrate, or ascending, stove or greenhouse annuals, natives of Western tropical and sub-tropical America, being mostly found on the sea-coasts. Flowers violet or white-and-violet, solitary, rather large; calyx shortly five-cleft; corolla campanulate or broadly funnel-shaped, with a five-angled, plicate limb. Berry watery, shorter than the inflated calyx. Leaves long-petiolate, deeply sinuate-toothed. *C. prostratus* (SYN. *Physalis prostrata*) has been introduced, but is probably not now in cultivation.

CACALIA SALICINA. A synonym of **Bedfordia salicina** (which *see*).

CACAO. *See* **Theobroma Cacao.**

CACARA. A synonym of **Pachyrhizus** (which *see*).

CACCINIA (named in honour of G. Caccini, an Italian savant). SYN. *Anisanthera* (of Rafinesque). ORD. *Borragineæ*. A small genus (five species) of hardy, perennial herbs, natives of the Orient. Flowers pedicellate, at length scattered; calyx five-cleft; corolla salver-shaped, with a slender tube and five spreading lobes; stamens five; racemes elongated, bracteate. Nutlets four, or by abortion fewer. Leaves alternate, the margins scabrous-ciliated. *C. glauca*, the only species in cultivation, thrives in any fairly good soil, and may be propagated by divisions.

C. glauca (greyish). *fl.* in racemose cymes; calyx lobes greenish-brown; corolla tube not exserted, the lobes violet-blue, turning red, ½in. long, oblong-lanceolate. *l.* 4in. to 8in. long, shortly petiolate, or the upper ones sessile, elliptic-oblong, sparsely tubercled. Stem below as thick as the thumb. *h.* 1ft. to 3ft. Persia and Afghanistan, 1880. (B. M. 6870.)

CACONAPEA. A synonym of **Herpestis** (which *see*).

CACTI may be described as herbs, shrubs, or trees, with soft flesh and copious watery juice. Root woody, branching, with soft bark. Stem branching or simple, round, angular, channelled, winged, flattened, or cylindrical; sometimes clothed with numerous tufts of spines, which vary in texture, size, and form very considerably; or, when spineless, the stems bear numerous dot-like scars, termed areoles. Leaves very minute, or entirely absent, falling off very early, except in *Pereskia* and several of the Opuntias, in which they are large, fleshy, and persistent. Flowers solitary, except in *Pereskia*, and borne on the top or the side of the stem; they are composed of numerous parts or segments; the sepals and petals are not easily distinguished from each other; the calyx-tube is joined to, or combined with, the ovary, and is often covered with scale-like sepals and hairs or spines; the calyx is sometimes partly united so as to form a tube,

Cacti—*continued.*

and the petals are spread in regular whorls, except in the Epiphyllums. Stamens many, springing from the side of the tube or throat of the calyx, sometimes joined to the petals, generally equal in length; anthers small and oblong. Ovary smooth, or covered with scales and spines, or woolly, one-celled; style simple, filiform or cylindrical, with a stigma of two or more spreading rays, upon which are small papillæ. Fruit pulpy, smooth, scaly, or spiny, the pulp soft and juicy, sweet or acid, and full of numerous small, usually black, seeds.

Tribe I.—*Calyx-tube produced beyond the Ovary. Stem covered with Tubercles, or Ribs, bearing Spines.*

1. MELOCACTUS. Stem globose; flowers in a dense cap-like head, composed of layers of bristly wool and slender spines, amongst which the small flowers are developed. The cap is pesistent, and increases annually with the stem.

2. MAMILLARIA (including *Anhalonium*). Stems short, usually globose, and covered with tubercles or mammæ, rarely ridged, the apex bearing spiny cushions; flowers mostly in rings round the stem.

3. PELECYPHORA. Stem small, club-shaped; tubercles in spiral rows, and flattened on the top, where are two rows of short scale-like spines.

4. LEUCHTENBERGIA. Stem naked at the base; tubercles on the upper part large, fleshy, elongated, three-angled, bearing at the apex a tuft of long, thin, bristle-like spines.

5. ECHINOCACTUS. Stem short, ridged, spiny; calyx-tube of the flower large, bell-shaped; ovary and fruit scaly.

6. DISOCACTUS. Stem short; calyx-tube thin, the throat filled by the stamens; ovary and fruit smooth.

7. CEREUS. Stem often long and erect, sometimes scandent, branching, ridged, or angular; flowers from the sides of the stem; calyx-tube elongated and regular; stamens free.

8. PHYLLOCACTUS. Stem flattened, jointed, and notched; flowers from the sides, large, having long, thin tubes, and a regular arrangement of the petals.

9. EPIPHYLLUM. Stem flattened, jointed; joints short; flowers from the apices of the joints; calyx-tube short; petals irregular, almost bilabiate.

Tribe II.—*Calyx-tube not produced beyond the Ovary. Stem branching, jointed.*

10. RHIPSALIS. Stem thin and rounded, angular, or flattened, bearing tufts of hair when young; flowers small; petals spreading; ovary smooth; fruit a small pea-like berry.

11. OPUNTIA. Stem jointed; joints broad and fleshy, or rounded; spines barbed; flowers large; fruit spinous, large, pear-like.

12. PEREKSIA. Stem woody, spiny, branching freely; leaves fleshy, large, persistent; flowers medium in size, in panicles on the ends of the branches.

The above is a key to the genera on the plan of the most recent botanical arrangement, but for horticultural purposes it is necessary that the two genera *Echinopsis* and *Pilocereus* should be kept up. They come next to *Cereus*, and are distinguished as follow:

ECHINOPSIS. Stem as in *Echinocactus*, but the flowers are produced low down from the side of the stem, and the flower-tube is long and curved.

PILOCEREUS. Stem tall, columnar, bearing long silky hairs as well as spines; flowers in a head on the top of the stem, rarely produced.

With the aid of the above key anyone ought to be able to say to what genus a particular Cactus belongs, and by referring to the descriptions of the species, he may succeed in making out what the plant is. For the classification of Cactuses, botanists rely mainly on their floral organs and fruit.

The stems of Cactuses show a very wide range of variation in size, in form, and in structure. In size, we have the colossal *Cereus giganteus*, whose straight stems, when old, are as firm as iron, and rise with many ascending arms, or rear their tall leafless trunks like ships' masts to a height of 60ft. or 70ft. From this we descend through a multitude of various shapes and sizes to the tiny tufted Mamillarias, no larger than a lady's thimble, or the creeping Rhipsalis, which lies along the hard ground on which it

Cacti—*continued.*

grows, and looks like hairy caterpillars. In form, the variety is very remarkable. We have the Mistletoe Cactus, with the appearance of a bunch of Mistletoe, berries and all; the Thimble Cactus; the Dumpling Cactus; the Melon Cactus; the Turk's Cap Cactus; the Rat's-tail Cactus; the Hedgehog Cactus; all having a resemblance to the things whose names they bear. Then there are the Indian Fig (*Opuntia*), with branches like battledores, joined by their ends; the *Epiphyllum* and *Phyllocactus*, with flattened leaf-like stems; the columnar, spiny *Cereus*, with deeply-channelled stems and the appearance of immense candelabra. Totally devoid of leaves, and often skeleton-like in appearance, these plants have a strange look about them, which is suggestive of some fossilised forms of vegetation belonging to the past ages.

The greater part of Cactuses belong to the group with tall or elongated stems. "It is worthy of remark that as the stems advance in age the angles fill up, or the articulations disappear, in consequence of the slow growth of the woody axis and the gradual development of the cellular substance; so that, at the end of a number of years, all the branches of Cactuses, however angular or compressed they originally may have been, become trunks that are either perfectly cylindrical, or which have scarcely any visible angles."

A second large group is that of which the Melon and Hedgehog Cactuses are good representatives; these have sphere-shaped stems, covered with stout spines. We have hitherto spoken of the Cactuses as being without leaves, but this is only true of them when in an old or fully-developed state. On many of the stems are found upon their surface, or angles, small tubercles, which, when young, bear tiny scale-like leaves. These, however, soon wither and fall off, so that, to all appearance, leaves are never present on these plants. There is one exception, however, in the Barbados Gooseberry (*Pereskia*), which bears true and persistent leaves; but these may be considered anomalous in the order.

The term "succulent" is applied to Cactuses because of the large proportion of cellular tissue, i.e., flesh, of their stems, as compared with the woody portion. In some of them, when young, the woody system appears to be altogether absent, and they have the appearance of a mass of fleshy matter, like a Vegetable Marrow. This succulent mass is protected by a tough skin, often of leather-like firmness, and almost without the little perforations called breathing and evaporating pores, which in other plants are very numerous. This enables the Cactuses to sustain without suffering the full ardour of the burning sun and parched-up nature of the soil peculiar to the countries of which they are native. Nature has endowed Cactuses with a skin similar to that with which she clothes many succulent fruits, such as the Apple, Plum, Peach, &c., to which the sun's powerful rays are necessary for their growth and ripening.

The spiny coat of the majority of Cactuses is no doubt intended to serve as a protection against the wild animals inhabiting with them the sterile plains of America, and to whom the cool, watery flesh of the Cactus would otherwise fall a prey. Indeed, these spines are not sufficient to prevent some animals from obtaining the watery insides of these plants, for we read that mules and wild horses kick them open and greedily devour their succulent flesh. It has also been suggested that the spines are intended to serve the plants as a sort of shade from the powerful sunshine, as they often spread over and interlace about the stems.

There is nothing in the nature or the requirements of Cactuses that should render their successful management beyond the means of anyone possessing a small, heated greenhouse, or even a window recess to which sunlight can be admitted during some portion of the day. In large establishments, such as Kew, it is possible to provide

Cacti—*continued.*

a spacious house (Fig. 186) specially for the cultivation of an extensive collection, where many of them may attain a good size before becoming too big. And it will be evident that where a house such as that at Kew can be afforded, much more satisfactory results may generally be obtained than if plants have to be provided for in a house containing various other plants, or in the window of a dwelling-room.

Apart altogether from size, it is, however, possible to grow a collection of Cactuses, and to grow them well, in a house of small dimensions—given the amount of sunlight and heat which are required by these plants. We sometimes see Cactuses—specimens, too, of choice and rare kinds—which have been reared in a cottager's window or in a small greenhouse, and which in health and beauty have at least equalled what has been accomplished in the most

Cacti—*continued.*

Cactaceous plants—it is possible to keep a collection of tiny Cactuses for years, if only the operations of watering, potting, ventilating, and other matters connected with ordinary plant-growing, are properly attended to.

IN WINDOW RECESSES. In the window recess larger specimens may be grown, and here it is possible to flower successfully many of the plants of the Cactus family. In a living-room window with a south aspect specimens of Phyllocactus, *Cereus flagelliformis*, Epiphyllum, and, in fact, of almost every kind of Cactus, are sometimes to be met with even in England; whilst in Germany they are as popular among the poorer classes as the Fuchsia, the Pelargonium, and the Musk are with us. One of the commonest of Cactuses in the latter country is the Rat's-tail Cactus (*Cereus flagelliformis*), and it is no unusual thing to see a large window of a cottager's dwelling

FIG. 186. SUCCULENT HOUSE AT KEW GARDENS.

elaborately prepared houses. It may be said that these successes, under conditions of the most limited kind, are accidental rather than the result of properly understood treatment; but however they have been brought about, these instances of good cultivation are sufficient to show that success is possible, even where the means are of the simplest or most restricted kind. Whether it be in a large house, fitted with the best arrangements, or in the window of the cottager, the conditions essential to the successful cultivation of Cactuses are practically the same.

IN WARDIAN CASES. To the professional gardener these cases are regarded as playthings. Notwithstanding this, they are a source of much interest, and even of instruction, to many to whom a greenhouse or serious gardening is an impossibility. In these little cases—for which we are indebted to Mr. Boller, a dealer in

thickly draped on the inside with the long, tail-like growths and handsome rose-coloured flowers of this plant. This is only one among dozens of species, all equally useful for window gardening, and all as interesting and beautiful as those above described. The Phyllocactus illustrated (Fig. 187) has been grown as a window plant for twenty years, and has had over twenty blossoms expanded at one time.

IN GREENHOUSES. For the greenhouse proper, Cactuses are well adapted, either as the sole occupants or as suitable for such positions as are afforded by shelves or baskets placed near the roof-glass. If the greenhouse is not fitted with heating arrangements, then, by selecting only those species of Cactus that are known to thrive in a position where, during winter, they are kept safe out of the reach of frost (of which a large number are known), a

Cacti—*continued.*

FIG. 187. GARDEN VARIETY OF PHYLLOCACTUS (Grown as a Window Plant).

good collection of these plants may be grown. In heated structures the selection of kinds may be made according to the space available, and to the conditions under which they will be expected to grow. Fig. 188 represents a section of a house for Cactuses, which will afford a good idea of the kind of structure best suited for them. The aspect is due south.

When grown on their own roots, the Epiphyllums, as well as the pendent-growing kinds of Rhipsalis, and several species of Cereus, may be placed in baskets and suspended from the roof. The baskets should be lined with thin slices of fibrous peat, and the whole of the middle filled with a mixture of peat, loam, and sand. When well managed, some very pretty objects are formed by the Epiphyllums grown as basket-plants. The climbing Cactuses are usually planted in a little mound composed of loam and brick rubble, and their stems either trained along rafters or allowed to run up the back wall of a greenhouse, against which they root freely, and are generally capable of taking care of themselves with very little attention from the gardener.

IN FRAMES. For cultivation in frames, the conditions are the same as for greenhouses. Even when grown in the latter, it will be found conducive to the health and flowering of the plants if, during the summer months, they can be placed in a frame with a south aspect, returning them to the house again on the decline of summer

Cacti—*continued.*

weather. Wherever the place selected for Cactuses may be, whether in a large plant-house, or a frame, or a window, it is of vital importance that the position should be exposed to bright sunshine during most of the day. In Germany, many growers of almost all the kinds of Cactuses place their young plants in frames, which are prepared as follows: In April or May a hot-bed of manure and leaves is prepared, and a frame placed upon it, looking south. Six inches of soil is put on the top of the bed, and in this, as soon as the temperature of the bed has fallen to about 70deg., the young plants are placed in rows. The frames are kept close, even in bright weather, except when there is too much moisture inside, and the plants are syringed twice daily in dry, hot weather. The growth they make under this treatment is astonishing. By the autumn the plants are ready to be ripened by exposure to sun and air, and in September they are lifted, planted in pots, and sent to market for sale. This method may be adopted in England, and if carefully managed, the growth the plants would make would far exceed anything ever accomplished when they are kept permanently in pots.

OUT-OF-DOORS. There are some kinds which may be grown out of doors altogether, if planted on a sunny, sheltered position on a rockery. The most successful plan is that followed at Kew, where a collection of the hardier species is planted in a rockery composed of brick rubble and stones. During summer the plants are exposed; but when cold weather and rains come, lights are placed permanently over the rockery, and in this way it is kept comparatively dry. No fire-heat or protection of any other kind is used, and the vigorous growth, robust health, and floriferousness of the several species are proofs of the fitness of the treatment for this class of plants.

In any garden where a few square yards in a sunny, well-drained position can be afforded for a raised rockery, the hardy Cactuses may be easily managed. To make a suitable rockery, proceed as follows: Find a position against the south wall of a house, greenhouse, or shed, and against this wall construct a raised rockery of brick rubble, lime rubbish, stones (soft sandstone, if possible), and fibrous loam. The rockery, when finished, should be,

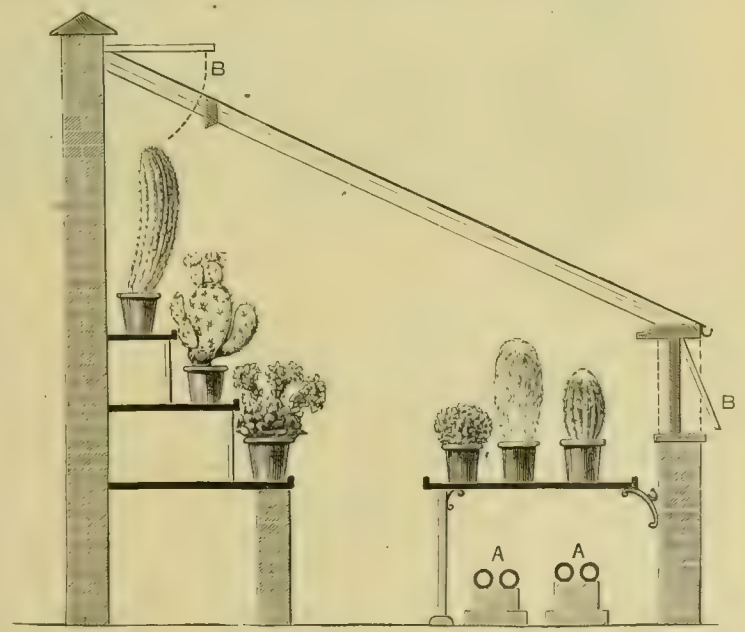


FIG. 188. SECTION OF HOUSE FOR CACTUSES. A, A, Hot-water Pipes; B, B, Ventilators.

Cacti—*continued.*

say, 4ft. wide, and reach along the wall as far as required; the back of the rockery would extend about 2ft. above the ground-level, and fall towards the front. Fix in the wall, 1ft. or so above the rockery, a number of hooks at intervals all along, to hold in position lights sufficiently long to cover the rockery from the wall to the front, where they could be supported by short posts driven in the ground. The lights should be removed during summer to some shed, and brought out for use on the approach of winter. Treated in this manner, the following hardy species could not fail to be a success: *Opuntia Rafinesquii* and var. *arkansana*, *O. vulgaris*, *O. brachyarthra*, *O. Picolominiana*, *O. missouriensis*, *O. humilis*, *Cereus Fendleri*, *C. Engelmanni*, *C. gonacanthus*, *C. phœniceus*, *Echinocactus Simpsoni*, *E. Pentlandi*, and *Mamillaria vivipara*. Cactuses and other succulents are sometimes planted out in beds as summer occupants (see Fig. 189).

Cacti—*continued.*

when placed in a compost of loam and leaf-mould, or loam and peat, yet the growth they make is generally too sappy and weak; it is simply fat without bone, which, when the necessary resting period comes round, either rots or gradually dries up. In preparing soil, therefore, for all Cactuses (except *Epiphyllum* and *Rhipsalis*, which will be treated separately), a good, rather stiff loam, with plenty of grass fibre in it, should form the principal ingredient, sand and, if obtainable, small brick rubble being added—one part of each of the latter to six parts of the former. The brick rubble should be pounded up so that the largest pieces are about the size of Hazel-nuts. Lime-rubbish, *i.e.*, old plaster from buildings, &c., is sometimes recommended for Cactuses, but it does not appear to be of any use except as drainage. At Kew its use has been discontinued, and it is now generally condemned by all good cultivators. Of course, the idea that lime was beneficial to Cactuses

FIG. 189. CACTI AND OTHER SUCCULENTS USED AS OUTDOOR BEDDING PLANTS IN PENGE RECREATION GROUND.

SOIL. The conditions in which plants grow naturally are what we usually try to imitate for their cultivation artificially. At all events, such is supposed to be theoretically right, however difficult it may be found in practice. In Cactuses, however, we have plants for which special conditions are necessary; and, as regards soil, whether we are guided by nature or by gardening experience, we are led to conclude that almost all of them thrive only when planted in one kind, that soil being principally loam. Plants which are limited in nature to sandy, sun-scorched plains or the glaring sides of rocky hills and mountains, where scarcely any other form of vegetation can exist, are not likely to require much decayed vegetable humus, but must obtain their food from inorganic substances, such as loam, sand, or lime. So it is with them when grown in our houses. They are healthiest and longest-lived when planted in a loamy soil; and although they may be grown fairly well for a time sprang from the knowledge that it existed in large quantities in the soil in which the plants grew naturally, and it is often found in abundance, in the form of oxalate of lime, in the old stems of the plants. But in good loam, lime, in the state of chalk, is always present, and this, together with the lime contained in the brick rubble, is sufficient to supply the plants with as much as they require.

For Epiphyllums and Rhipsalis, both of which are epiphytal naturally, but which are found to thrive best in pots in our houses, a mixture of equal parts peat and loam with sand and brick rubble in the same proportion as before recommended, will be found most suitable. Leaf-mould is sometimes used for these plants; but unless really good it is best omitted. The finest Epiphyllums have been grown in a soil consisting almost entirely of a light fibry loam, with the addition of a little crushed bones.

Cacti—*continued.*

POTTING. Cactuses, when healthy, are injuriously affected by frequent disturbance at the roots. On the arrival of the potting season, which for these plants is in April and May, the roots of established plants should be examined, and if they are found to be in a healthy condition, and the soil sweet, they should be replaced in the same pots to continue in them another year. If the roots are decayed, or the soil has become sour, it should be shaken away from the roots, which must be examined, cutting away all decayed portions, and shortening the longest roots to within a few inches of the base of the plant. Cactuses are so tenacious of life, and appear to rely so little on their roots, that it will be found the wisest plan, when repotting them, to cut the roots thoroughly.

The size of pots most suitable is what would be considered small in comparison with other plants, Cactuses preferring to be somewhat restricted as to root-room. This, indeed, is how they are found when wild, the roots generally fixing themselves in the crevices of the rocks or stones about which the plants grow, so that a large specimen is often found to have only a few inches of space in the cleft of a rock for the whole of its roots. When thus limited, growth is firmer and the flowers are produced in much greater profusion than when a liberal amount of space is afforded. The pots should be well drained—about one-fifth of their depth filled with drainage when intended for large, strong-growing kinds, and one-third for the smaller ones, such as Mamillarias. A layer of rough fibry material should be placed over the crocks to prevent the finer soil from stopping the drainage. When filling in the soil, press it down firmly, spreading the roots well amongst it, and keeping the base of the plant only 1in. or so below the surface.

For plants with weak stems, stakes will be necessary, and even stout-stemmed kinds, when their roots are not sufficient to hold them firmly, will do best if fastened to one or two strong stakes till they have made new roots and got firm hold of the soil. Epiphyllums, when grown as standards, should be tied to strong wire supports, those with three short, prong-like legs being most desirable, as, owing to the weight of the head of the plant, a single stake is not sufficient to hold the whole firmly After potting, no water should be given for a few weeks. In fact, if the atmosphere in which the plants are placed be kept a little moist, it will not be necessary to water them till signs of fresh growth are perceived.

For Epiphyllums and Rhipsalis, water will be required earlier than this; but even they are best left for a few days without water after they have been repotted. As soon as fresh growth is perceived, the plants may be well watered, and from this time water may be supplied as often as the soil approaches dryness. Newly-imported plants, which on arrival are usually much shrivelled and rootless, should be potted in rather dry soil and small pots, and treated as recommended above. Cactuses contain an abundance of nourishment stored up in their stems, and upon this they will continue to exist for a considerable time without suffering; and, when their growing season comes round, root action commences whether the soil is wet or dry, the latter being the more favourable.

WATERING. It will have been gathered from what has been previously said in relation to the conditions under which the majority of the plants of the Cactus family grow when wild, that during their season of growth they require a good supply of moisture, both at the root and overhead; and afterwards a somewhat lengthened period of rest, that is, almost total dryness, accompanied by all the sunlight possible, and generally a somewhat high temperature. The growing season for all those kinds which require to be kept dry when at rest is from the end of April to the middle of August, and during this time they should be kept moderately moist, but not constantly

Cacti—*continued.*

saturated, which, however, is not likely to occur if the water is not carelessly supplied, and the drainage and soil are perfect. This treatment corresponds with what happens to Cactuses in a wild state, the frequent and heavy rains which occur in the earlier part of the summer in the American plains supplying the amount of moisture necessary to enable these plants to make fresh growth, and produce their beautiful flowers and spine-clothed fruits. After August, little or no rain falls, and the Cactuses assume a rather shrivelled appearance, which gives them an unhealthy look, but which is really a sign of ripeness, promising a plentiful crop of flowers when the rainy season again returns.

As the sun in England is not nearly so powerful as in the hot plains of Central America and the Southern States of North America, where Cactuses are found in greatest abundance, it will be evident that, if flowers are to be produced, we must see that our plants have a sufficiency of water in early summer, and little or none during the autumn and winter, whilst the whole year round they should be exposed to all the sunlight possible, the temperature, of course, varying with the requirements of the species, whether it is a native of tropical or of temperate regions. It is important that the cultivator should understand that if water is liberally supplied all through the summer, the plants cannot obtain the rest which is necessary to their ripening and producing flowers, as dryness at the root alone is not sufficient to provide this, but must be accompanied by exposure to bright sunlight, which is not possible in England during winter, so that the ripening process must begin before the summer is over.

It is possible to preserve most Cactuses alive by keeping them constantly growing; but, with very few exceptions, such treatment prevents the plants from flowering. The following is what is practised in the gardens where Cactuses are successfully cultivated. For the genera *Cereus*, *Echinopsis*, *Echinocactus*, *Mamillaria*, *Opuntia*, and *Melocactus*, a moist tropical house is provided, and in April the plants are freely watered at the root, and syringed overhead both morning and afternoon on all bright days. This treatment is continued till the end of July, when syringing is suspended, and the water supplied to the roots gradually reduced. By the end of August the plants are placed in a large light frame with a south aspect, except the tall-growing kinds, which are too bulky to remove. In this frame the plants are kept till the summer is over, and are watered only about once a week should the sun be very powerful. The lights are removed on all bright, sunny days, but are kept on during wet or dull weather, and at night. Under this treatment, many of the species assume a reddish appearance, and the thick, fleshy-stemmed kinds generally shrivel somewhat. There is no occasion for alarm in the coloured and shrivelled appearance of the plants: on the contrary, it may be hailed as a good sign for flowers.

A common complaint in relation to Cacti as flowering plants is that they grow all right, but rarely or never flower. The explanation of this is shown by the fact that the plants must be properly ripened and rested before they can produce flowers. On the approach of cold weather the plants which were removed to a frame to be ripened should be brought back into the house for the winter, and kept quite dry at the roots till the return of spring, when their flowers will be developed either before or soon after the watering season again commences.

Hitherto we have been dealing with those genera which have thick fleshy stems, but there still remain the genera *Rhipsalis*, *Epiphyllum*, and *Phyllocactus*, which are not capable of bearing the long period of drought advised for the former. The last-mentioned genus should, however, be kept almost dry at the root during winter, and, if placed in a light, airy house till the turn of the year, the branches will ripen, and set their flower buds much more readily than

Cacti—*continued.*

when they are wintered in a moist partially-shaded house. During summer all the Phyllocactuses delight in plenty of water, and, when growing freely, a weak solution of manure affords them good food. Epiphyllums must be kept always more or less moist at the root, though, of course, when growing freely, they require more water than when growth has ceased for the year, which happens late in autumn. The same rule applies to *Rhipsalis*, none of the species of which are happy when kept long dry. For the several species of *Opuntia* and *Echinopsis*, which are sufficiently hardy to be cultivated on a sunny rockery out of doors, it will be found a wise precaution to place either a pane of glass or a handlight over the plants in wet autumns and during winter, not so much to serve as protection from cold as to shield them from an excess of moisture at a time when it would prove injurious.

TEMPERATURE. The amount of heat required by the different species of Cactus varies very considerably. The majority of Cactuses may be kept alive in one house where all would be subjected to the same temperature, but many of the plants would merely exist, and could not possibly flower. It would be easy to point to several instances of this unsatisfactory state of things. At Kew, for example, owing to the arrangements necessary for the public, it is found convenient to have the majority of the large collection of Cactuses in one house, where the plants present an imposing appearance, but where, as might be expected, a good number of the species very rarely produce flowers. The Cactuses which inhabit the plains of the Southern United States are subjected to a very high summer temperature, and a winter of intense cold; whilst on the other hand the species found in Central and South America do not undergo nearly so wide an extreme, the difference between the summer and the winter temperatures of these countries being generally much less marked. A tropical temperature for Cacti is in summer 70deg., rising to 90deg. with sun heat, night temperature 65deg. to 70deg., in winter 60deg. to 65deg. Temperate: in summer 60deg., rising to 75deg. with sun heat, night 60deg. to 65deg., in winter 50deg. to 55deg. The hardy species will, of course, bear the ordinary temperatures of this country; but, to enable them to withstand a very cold winter, they must be kept as dry as possible. In the colder parts of England it is not advisable to leave any of these plants outside during winter.

INSECT PESTS. Notwithstanding the thickness of skin characteristic of almost every one of the Cactuses, they are frequently attacked by various kinds of garden pests when under cultivation, and more especially by Mealy Bug. There is, of course, no difficulty in removing such insects from the species with few or no spines upon their stems; but when the plants are thickly covered with clusters of spines and hairs, the insects are not easily got rid of. For Cactuses, as well as for other plants subject to this most troublesome insect, various kinds of insecticide have been recommended; but the best, cheapest, and most effectual with which we are acquainted is paraffin, its only drawback being the injury it does to the plants when applied carelessly, or when not sufficiently diluted. A wineglassful of the oil, added to 1gall. of soft water, and about 2oz. of soft soap, the whole to be kept thoroughly mixed by frequently stirring it, forms a solution strong enough to destroy Mealy Bug. In applying this mixture, a syringe should be used, or, if the plants are to be dipped over-head, care must be taken to have the oil thoroughly diffused through the water, or the plant, when lifted out, will be covered with pure paraffin, which does not mix properly with water, but floats upon the surface if allowed to stand for a few moments. The plants should be laid on their sides to be syringed with the mixture, and after they have been thoroughly wetted, they may be allowed to stand for a few minutes before being syringed with pure water. Plants that are badly infested

Cacti—*continued.*

with Mealy Bug should be syringed with the paraffin mixture once a day, for about a week. It is easy to do serious harm to these plants by using a stronger solution than is here recommended, and also by not properly mixing the oil with the soap and water; and the amateur cannot, therefore, be too careful in his use of this excellent insecticide.

For Scale, which sometimes infests these plants, and which is sometimes found upon them when wild, the paraffin may be used with good effect.

Thrips attack *Phyllocactus*, *Rhipsalis*, and *Epiphyllum*, especially when the plants are grown in less shade, or in a higher temperature, than is good for them. Fumigation with tobacco, dipping in a strong solution of tobacco, or sponging with a mixture of soap and water, are either of them effectual when applied to plants infested with Thrips. The same may be said of Green-fly, which sometimes attacks the Epiphyllums.

Hot water (140deg. Fahr.) may also be successfully employed against insects upon Cacti. It should be syringed on in the manner indicated.

A blight, something similar to Mealy Bug, now and again appears on the roots of some of the species of *Echinocactus* and *Cereus*. This may be destroyed by dipping the whole of the roots in the mixture recommended for the stems when infested by Mealy Bug, and afterwards allowing them to stand for a few minutes immersed in pure water. They may then be placed where they will dry quickly, and finally, in a day or two, repotted into new compost, first removing every particle of the old soil from the roots.

DISEASES. Under artificial cultivation there are many conditions more or less unfavourable to the health of plants, and, in the case of Cactuses, very large specimens, when imported from their native haunts to be placed in our glass-houses, soon perish. At Kew, there have been, at various times, fine specimens of some of the largest-growing species, but they have never lived longer than a year or so, always gradually shrinking in size till, finally, owing to the absence of proper nourishment, and to other untoward conditions, they have broken down and rotted. This rotting of the tissue, or flesh, of these plants, is the great enemy to their cultivation in England. When it appears it should be carefully cut out with a sharp knife, and the plant should then be exposed to the influence of a perfectly dry atmosphere for a few days till the wound has dried, when it should be potted in a sandy compost and treated as for cuttings. Sometimes the decay begins in the side of the stem of the plant, in which case it should be cut away, and the wound exposed to a dry air. The cause of this decay at the base or in the side of the stems of Cactuses is no doubt debility, which is the result of the absence of some necessary condition when the plants are cultivated in houses or windows in this country.

Grafted plants, especially Epiphyllums, when worked on to *Pereskia* stocks, are apt to grow weak and flabby through the stem wearing out, or through the presence of Mealy Bug or other insects in the crevices of the part where the stock and scion join. In this case it is best to prepare fresh stocks of *Pereskia*, and graft on to them the best of the pieces of *Epiphyllum* from the old, debilitated plant. It is no use trying to get such plants to recover, as, when once this disease or weakness begins, it cannot easily be stopped.

PROPAGATION. Cactuses may be multiplied from cuttings of the stems, from seeds, and also by means of grafting; this last method is adopted for those species which, under cultivation, are not easily kept in health when growing upon their own roots, or, as in the case of Epiphyllums, when it offers a means of speedily forming large and shapely specimens. From seeds the plants are generally freer in growth than when cuttings are used, although the seedlings are longer in growing into flowering specimens than large cuttings would be.

Cacti—*continued.*

Seeds. Good fresh seeds of Cactaceous plants germinate in from two to four weeks after sowing, if placed in a warm house or on a hotbed with a temperature of 80deg. If sown in a lower temperature, the time they take to vegetate is longer; but, unless in a very low degree of heat, the seeds, if good, and if properly managed as regards soil and water, rarely fail to germinate. For all the kinds, pots or pans containing drainage to within 2in. of the top, and then filled up with finely-sifted loam and sand, three parts of the former to one of the latter, and pressed down moderately firm, will be found to answer. If the soil be moist at the time of sowing the seeds, it will not be necessary to water it for a day or two. The seeds should be scattered thinly over the surface of the soil, and then covered with about ¼in. of soil. Over this, a pane of glass may be placed, and should remain till the seedlings appear above the soil. Should the position where the seeds are to be raised be in a room window, this pane of glass will be found very useful in preventing the dry air of the room from absorbing all the moisture from the soil about the seeds. For the germination of Cactus, and indeed of all seeds, a certain amount of moisture must be constantly

FIG. 190.—SEEDLINGS OF CEREUS.

a, One month after germination. *b*, Two months after germination. *c*, Three months after germination. (Magnified six times.)

present in the soil; and after a seed has commenced to grow, to allow it to get dry is to run the risk of killing it.

The seeds of Cactuses may be sown at any time in the year; but it is best to sow in spring, as, after germinating, the young plants have the summer before them in which to attain sufficient strength to enable them to pass through the winter without suffering; whereas plants raised from autumn-sown seeds have often a poor chance of surviving through the winter, unless treated with great care. The seeds of all Cactuses are small, and therefore the seedlings are at first tiny globular masses of watery flesh, very different from what we find in the seedlings of ordinary garden plants. The form of the seedling of a species of *Cereus* is shown at Fig. 190, and its transition from a small globule-like mass of flesh to the spine-clothed stem, which characterises this genus, is also represented. At *a* we see the young plant after it has emerged from the seed, the outer shell of which was attached to one of the sides of the aperture at the top till about a week before the drawing was made. At *b*, the further swelling and opening out, as it were, of what, in botanical language, is known as the cotyledon stage of development, will be seen; a month afterwards, this will have assumed the shape of a very

Cacti—*continued.*

small *Cereus*. It is interesting to note how the soft fleshy mass which first grows out of the seed is nothing more than a little bag of food with a tiny growing point fixed in its top, and that, as the growing point increases, the food-bag decreases, till finally the whole of the latter becomes absorbed into the young stem, which is now capable of obtaining nourishment by means of its newly-formed roots. In the genus *Opuntia*, the cotyledon stage (see Fig. 749, Vol. II.) of the plant is different from that of the *Cereus*, and is more like that of a Cucumber. Still, though the form is different, the purpose of the two cotyledons and the juicy stem in the seedling *Opuntia* is the same as in the *Cereus*; and, as the growing point develops, the cotyledons shrivel up and fall off, the plant food they contained having passed into that part of the young seedling which was to be permanent.

The seedlings of these two genera serve as an illustration of the process of germination from seed of all the Cactuses; and it must be evident that there is much that is singular and full of interest in raising these plants from seeds. As soon as the seedlings are large enough to be handled, they may be planted separately in small pots, using a compost similar to, but slightly coarser than, that in which the seeds were sown. The soil should be kept moist till the summer is over, and after that, till the return of warm sunny weather, it will be found safest to keep the seedlings on the dry side, a little water only being given at intervals of a week, and only when the sun is shining upon the plants.

To obtain seeds from cultivated plants, it is necessary, in order to ensure fertilisation, that the top of the stigma should be dusted over with the dust-like pollen from the anthers. This may be done by means of a small camel-hair brush; this should be moistened in the mouth and then pushed among the anthers till covered with pollen, which may then be gently rubbed on to the stigma. A warm, sunny morning is the most suitable time for this operation, as fertilisation takes place much more readily under the influence of bright sunshine than at any other time. Some Cactuses have their floral organs so arranged as to be capable of self-fertilisation; still, it is always as well to give them assistance. The night-flowering species must of course be fertilised either at night or very early in the morning. By using the pollen from one kind for dusting on to the stigma of another, hybrids may be obtained, and it is owing to the readiness with which the plants of this family cross with each other that so many hybrids and forms of the genera *Epiphyllum* and *Phyllocactus* have been raised. It would be useless to attempt such a cross as *Epiphyllum* with *Cereus giganteus*, because of their widely different natures; but such crosses as *Epiphyllum* with *Phyllocactus*, and *Cereus flagelliformis* with *C. speciosissimus*, have been brought about.

Cuttings. No plants are more readily increased from stem-cuttings than Cactuses; for, be the cutting 20ft. high, or only as large as a thimble, it strikes root readily if placed in a warm temperature and kept slightly moist. At Kew, it is the common practice, when the large-growing specimens get too tall for the house in which they are grown, to cut off the top of the stem to a length of 6ft. or 8ft., and plant it in a pot of soil to form a new plant. The old base is kept for stock, as it often happens that just below the point where the stem was severed, lateral buds are developed, and these, when grown into branches, are removed and used as cuttings. Large Opuntias are treated in the same way, with the almost invariable result that even the largest branches root freely, and are in no way injured by what appears to be exceedingly rough treatment. Large cuttings striking root so freely, it must follow that small cuttings will likewise soon form roots. In fact, there is not one species in cultivation which may not be easily multiplied by means of cuttings. The nature of a Cactus stem is so very different from the

Cacti—*continued.*

stems of most other plants, that no comparison can be made between them in respect of their root-developing power, the rooting of a Cactus cutting being as certain as the rooting of a bulb. The very soft, fleshy stems of some Cactuses, Echinocactuses for example, should be exposed to the air for a time, so that the cut at the base may dry before it is buried in the soil. If the base of a plant decays, all that is necessary is the removal of the decayed portion, exposure of the wound to the air for two or three days, and then the planting of the cutting in a dry, sandy soil, and placing it in a warm moist house till rooted. All cuttings of Cactuses may be treated in this way. If anything proves destructive to these cuttings, it is an excess of moisture in the soil.

Grafting. The object of grafting is generally either to effect certain changes in the nature of the scion, by uniting it with a stock of a character different from its own, which usually results in the better production of flowers, fruit, &c., or to multiply those plants which are not readily increased by the more ordinary methods of cuttings or seeds. In the case of Cactuses, however, we resort to grafting, not because of any difficulty in obtaining the kinds thus treated from either cuttings or seeds, as we have already seen that all the species of Cactuses grow freely from seed, or are easily raised from cuttings of their stems, nor yet to effect any change in the characters of the plants thus treated, but because some of the more delicate kinds, and especially the smaller ones, are apt to rot at the base during the damp, foggy weather of our winters; and, to prevent this, it is found a good and safe plan to graft them on to stocks formed of more robust kinds, or even on to plants of other genera, such as *Cereus* or *Echinocactus*. By this means, the delicate plants are raised above the soil whence the injury in winter usually arises, and they are also kept well supplied with food by the more robust and active nature of the roots of the plant upon which they are grafted.

Grafting is also adopted for some of the Cactuses to add to the grotesqueness of their appearance; a spherical *Echinocactus* or *Mamillaria* being united to a columnar stem of another kind, so as to produce the appearance of a drum-stick; or a large round-growing species may be grafted on to three such stems, which may then be likened to a globe supported upon three columns. As the species and genera unite freely with each other, it is possible to produce, by means of grafting, some very extraordinary-looking plants, and to a lover of the incongruous and "queer," these plants will afford much interest and amusement. Besides the above, Epiphyllums, and the long drooping Cereuses—such as *C. flagelliformis*—are grafted because of their pendent habit; they are therefore seen to better advantage when growing from the tall erect stem of some stouter kind, than if allowed to grow on their own roots. By growing on a *Pereskia* into a large plant, and then cutting it into any shape desired, we may, by grafting upon its spurs or branches a number of pieces of *Epiphyllum*, obtain large flowering specimens of various shapes in a comparatively short time. For general purposes, it is usual to graft Epiphyllums on to stems, about 1ft. high, of *Pereskia aculeata*, pretty little standard plants being in this way formed in about a year from the time of grafting. As an instance of how easily some kinds may be grafted, we may note what was done with a large head of the Rat's-tail Cactus which had been grown for some years on the stem of *Cereus rostratus*, but which rotted off just below the point of union. On re-grafting this head on to the *Cereus* a little lower down, it failed to unite, and, attributing the failure to possible ill-health in the stock, it was determined to transfer the Rat's-tail Cactus to a large stem of *Pereskia aculeata*, the result being a quick union and rapid, healthy growth since. Upon the same stock some grafts of *Epiphyllum* had previously been worked. In Fig. 191 we have a fine

Cacti—*continued.*

example of this kind of grafting. It represents a stem of *Pereskia Bleo* upon which the Rat's-tail Cactus and an *Epiphyllum* have been grafted.

For most plants the operation of grafting must be carefully and skilfully performed, but in the case of Cactuses very little skill is necessary if one or two rules, which apply to all kinds of grafting, are observed. The period of vigorous growth, and while the sap of both the stock and the scion is in motion, is the most favourable time for the operation. It is then only necessary, in order

FIG. 191. PERESKIA BLEO, with EPIPHYLLUM and CEREUS FLAGELLIFORMIS grafted upon it.

to bring about a speedy union, that the parts grafted should be cut so as to fit each other properly, and then bound or in some way fastened together so that they will remain in close contact with each other till a union is effected. A close atmosphere and, if possible, a little shade, should be afforded the worked plants till the grafts have taken. The ligature used should not be bound round the graft too tightly, or it will prevent the flow of the sap; if bound tightly enough to hold the parts together, and to prevent their slipping, that will be found quite sufficient.

Cacti—*continued.*

Epiphyllums are treated as follow: Cuttings of *Pereskia* are rooted and grown on to the required size, and in the month of September they are headed down, the tops being used as cuttings. Grafts of *Epiphyllum* are then prepared by cutting them to the required length, usually about 6in., and removing a thin slice of the fleshy stem on each side so as to form a flat wedge. The stem of *Pereskia* is then split down about 1in. with a sharp knife, and into this the wedge of the graft is inserted, and fastened either by means of a small pin passed through the stem and graft about half-way up the slit, or by binding round them a little worsted or matting, the former being preferred. The worked plants are then placed in a close handlight or propagating-frame, having a temperature of about 75deg. where they are kept moist by sprinkling them daily with water; they must be shaded from bright sunlight. As soon as a union has been effected, which will be seen by the grafts beginning to grow, the ligature and pin should be removed, and the plants gradually hardened off by admitting air to the box, till finally they may be removed to the house where it is intended to grow them. In a cottage window this operation may be successfully performed if a box with a movable glass top, or a large bell-glass, be used to keep the grafts close till they have taken.

FIG. 192. GRAFT OF MAMILLARIA RECURVA ON CEREUS NYCTICALUS.

FIG. 193. GRAFT OF OPUNTIA DECIPIENS ON O. FICUS-INDICA.

For the spherical-stemmed kinds of *Mamillaria*, *Cereus*, *Echinocactus*, &c., a different method is found to answer. Instead of cutting the base of the graft to a wedge shape, it is simply cut across the base horizontally, or, in other words, a portion of the bottom of the graft is sliced off, and a stock procured which, when cut across the top, will about fit the wound at the base of the scion; the two sliced parts are placed together, and secured either by passing a piece of matting a few times over the top of the graft and under the pot containing the stock, or by placing three stakes around it in such a way that, when tied together at the top, they will hold the graft firmly in position. Another method is that of cutting the base of the scion in the form of a round wedge, and then scooping a hole out in the centre of the stock large enough to fit this wedge; the scion is pressed into this, and then secured in the manner above mentioned.

To graft one spherical-stemmed kind on to three columnar-stemmed ones, the latter must first be established in one pot and, when ready for grafting, cut at the

Cacti—*continued.*

top into rounded wedges, three holes to correspond being cut into the scion. When fixed, the top should be securely fastened by tying it to the pot, or by means of stakes. For this last operation patience and care are necessary to make the stocks and scions fit properly; but if the rules that apply to grafting are properly followed, there will be little fear of the operation failing. In the accompanying illustrations, we have a small *Mamillaria* stem grafted on to the apex of the tall quadrangular-stemmed night-flowering *Cereus* (see Fig. 192), and also a cylindrical-stemmed *Opuntia* worked on a branch of the flat, battledore-like Indian Fig (see Fig. 193).

CADAMBA. Included under **Guettarda** (which *see*).

CADIA (this name is an alteration of the Arabic *Kadi*). SYNS. *Panciatica*, *Spaëndoncea*. ORD. *Leguminosæ*. A small genus (three species are known) of stove, evergreen shrubs, natives of Eastern tropical Africa, Southern Arabia, and Madagascar. Flowers whitish, pink, or purple, solitary in the axils or few in a raceme, pendulous; calyx broadly campanulate, with nearly equal lobes; petals nearly all alike, free, erecto-patent, oblong-ovate or sub-orbicular, very shortly clawed; stamens free, subequal; bracts small; bracteoles wanting. Pods linear, acuminate, two-valved. Leaves impari-pinnate; leaflets small, exstipellate; stipules minute. *C. Ellisiana*, the only species yet introduced, is a small, slender, perfectly glabrous bush, requiring similar culture to **Brownea** (which *see*).

C. Ellisiana (Rev. W. Ellis'). *fl.* rose-red, 1½in. long; petals twice as long as the calyx, obovate-spathulate, convolute, forming a campanulate corolla; racemes short and shortly pedunculate, axillary. December. *l.* alternate, 4in. to 6in. long; leaflets distant, alternate, spreading, very shortly petiolulate, 3in. to 4in. long, elliptic-oblong or lanceolate, obtusely acuminate; petioles very short, swollen at base. Madagascar, 1882. (B. M. 6685.)

CÆRULESCENT. Bluish; the same as Cœrulescent.

CÆSALPINIA. Including *Guilandina*. This genus comprises about thirty-eight species, distributed over the warmer regions of the globe. To those described on p. 232, Vol. I., the following should be added. *See also* **Coulteria** (which should be included hereunder).

C. bicolor (two-coloured). *fl.* reddish-purple. *fr.* a flat, broad pod, 2in. long. *l.* bipinnate. Branches thorny. *h.* 20ft. South America, 1896. This tree yields a fine Brazil wood, valuable for dyeing.

C. Bonducella (Bonducella). *fl.* yellow; petals little exserted; racemes long-pedunculate, simple or paniculate. *l.* 1ft. or more in length; pinnæ usually twelve to sixteen; leaflets oblong, obtuse, mucronate, ½in. to 1in. long, downy beneath. Branches grey-downy. India, &c. SYN. *Guilandina Bonducella*.

C. brasiliensis. The correct name is *Peltophorum Linnæi*.

C. crista (crest). A synonym of *C. sepiaria*.

C. Gilliesii (Dr. Gillies'). *fl.* large and handsome, several in a terminal raceme; petals five, yellow, obcordate, spreading; stamens ten, bright red, free, 4in. to 5in. long. Summer. *l.* alternate, abruptly bipinnate; leaflets scarcely ½in. long, oblong, obtuse. Stem erect, much-branched. Mendoza, South America, 1829. Hardy. SYN. *Poinciana Gilliesii* (B. M. 4006; P. M. B. i. 28).

C. japonica (Japanese). A synonym of *C. sepiaria*.

C. lacerans (torn). A synonym of *Pterolobium indicum*.

C. pulcherrima (very pretty). The correct name of *Poinciana pulcherrima*.

C. sepiaria (hedge-loving). *fl.* yellow, terminal, racemose, drooping; peduncles alternate, filiform, horizontal, one-flowered. May and June. *l.* bipinnate; leaflets sub-sessile, oblong, very obtuse, entire, equilateral, glabrous; petioles and shoots prickly. Stem 6ft. high, arborescent. Japan, 1883. Hardy. (G. C. 1882, iv., p. 513, f. 73; G. M. 21st July, 1888, p. 445.) SYN. *C. crista*.

CÆSIA (named in honour of F. Cæsia). ORD. *Liliaceæ*. A genus including about nine species of greenhouse, tufted herbs, allied to *Arthropodium*, confined to Australia and South Africa. Flowers blue or white, disposed in scattered groups at the sides of the panicle-branches; perianth spirally twisted, the segments

Cæsia—*continued.*

very shortly connate at base, three-nerved, spreading; stamens six; pedicels filiform. Leaves clustered at the base of the stem or under the lower branches of the stem. Rhizome short. *C. vittata*, an Australian species with small, pale blue flowers, has been introduced, but is probably lost to cultivation.

CAILLIEA. A synonym of **Dichrostachys** (which *see*).

CAINITO. A synonym of **Chrysophyllum** (which *see*).

CAJOPHORA [properly **CAIOPHORA**]. Included under **Blumenbachia** (which *see*).

CALADENIA. Including *Leptoceras*. *C. Patersoni* and its form *dilatata* are in cultivation at Kew. *See also* **Glossodia.**

CALADIUM. A very large number of plants have been described as species of this genus, but according to Engler, in Alph. de Candolle's "Monographiæ Phanerogamarum," not more than seven are entitled to rank as such; all are natives of tropical America. The roots of *C. bicolor* and some other species are edible, and are known in tropical countries as Cocoa Roots. Some of the plants formerly included here are now referred to **Anchomanes, Culcasia, Dieffenbachia, Gonatanthus, Montrichardia, Philodendron, Remusatia,** and **Zamioculcas.**

These elegant ornamental stove plants have been improved so much of late years that it looks as if their leaf-colouring had reached the high-water mark of perfection. Where many gardeners fail with these plants is in not thoroughly ripening the tubers in autumn by gradually withholding the water. As soon as the leaves die down the roots should be turned out of the pots and stored in dry silver-sand out of the reach of drip, and in a temperature of 70deg. Propagation is effected by dividing the tubers as soon as growth has commenced. The leaves of most kinds require a neat stick by way of support. To those kinds described on pp. 233-4, Vol. I., the following should be added:

C. adamantinum (adamantine). *l.* deflexed, sagittate, dark green, with white venation, and having numerous white dots along the borders of the veins. Peru, 1891. (I. H. xxxviii., t. 132.)

C. Humboldtii (Humboldt's). The correct name of *C. argyrites.*

C. liliputianum (dwarf). This is apparently a dwarf form of *C. Humboldtii.* It has also been called *C. liliputiense.* 1895.

C. medioradiatum (middle-rayed). *l.* peltate-ovate, acute, notched at the base, dark green, the course of the midrib and its two branches silvery-white; petioles mottled with brown. Colombia, 1891. (I. H. xxxviii., t. 128.)

C. rubescens (reddish). *fl.*, spathe green, with a blackish stripe, 3½in. long. *l.* 6in. long, 2in. broad, ovate-lanceolate, wavy, with short basal lobes, crimson, margined with green. Brazil, 1893.

C. sagittatum (arrow-head-like). *l.* narrow-sagittate, deeply bilobed, dark green, the midrib and some of its branches feathered with red. Brazil, 1891. (I. H. xxxviii., t. 138.)

C. Seguinum (Seguinum). A synonym of *Dieffenbachia Seguine.*

C. venosum (veined). *fl.*, spathe green, 3in. long. *l.* 10in. long, 4in. broad, green, with yellowish nerves and a red margin. Brazil, 1893.

C. violaceum (violet). This is probably identical with *Colocasia antiquorum.*

Varieties. Some of the most noteworthy are included in the enumeration here given:

AVILON*, bright carmine, with darker veinings, margined with green, and freckled with white; BARONNE ADOLPHE DE ROTHSCHILD, crimson, rose spotted; BARONNE CLARA DE HIRSCH*, cream white, with deep rose markings; BARONESS SCHROEDER*, bronzy-gold, rose-tinted, bright crimson veinings, distinct; CANDIDUM*, white, veined dark green; CARDINALE*, crimson, spotted and marked green and yellow; CHARLEMAGNE*, bright red, rose-shaded, and veined dark red; COMTE DE GERMINY, red, with white mottlings; DUCHESS OF FIFE, white, with dark green reticulations, veined bright rose-carmine; EDITH LUTHER*, bronzy-pink, blotched silver, and veined rose-carmine; EXQUISITE*, bright carmine, margined light green; GASPARD CRAYER, deep crimson, with green margin and bright crimson veinings; HER MAJESTY, bright silvery-white, with carmine blotches; LADY STAFFORD NORTHCOTE*, blood-red, shaded crimson; LEONARD BAURE*, pure white, spotted blood-red, veined and flushed pale carmine; MARTIN LUTHER*, rose-crimson, dwarf and compact; MRS. ICETON*, sulphur-yellow, blotched with white, and lined with crimson; MRS. M'LEOD*, violet-maroon footstalks, with bright scarlet blade and dark red veinings; ORIFLAMME, bright red, with green margins; RAYMOND LEMOINIER, carmine-red, with sulphur margin; SILVER CLOUD, silvery-white, spotted with green, with carmine veins; SIR HENRY IRVING*, creamy-white, mottled greenish-white, with rose-pink veins; TENNYSON*, bright green, mottled yellow elegantly blotched.

CALAIS. A synonym of **Microseris** (which *see*).

CALAMAGROSTIS. Smallreed. This genus embraces about five species, broadly scattered over the globe; it was formerly included under *Arundo*, from which it is distinguished principally by the one-flowered spikelets. The British Flora includes three species, *C. Epigeios* and the two described on p. 234, Vol. I.

CALAMINTHA. Including *Acinos.* About forty species, distributed over the North temperate regions, are included in this genus. *C. Acinos* (Basil Thyme), *C. Clinopodium* (Wild Basil), and *C. officinalis* (Common Calamint) are included in the British Flora. To those described on p. 235, Vol. I., the following should be added:

C. glabella (almost glabrous). *fl.* lilac-purple, scented; corolla nearly ½in. long; axils three- to five-flowered. Summer. *l.* oblong or broadly lanceolate, tapering at base, the larger ones serrated. Stems lax or decumbent, 1ft. to 2ft. long. North America. Rockery.

C. mimuloides (Mimulus-like). *fl.* orange-yellow, mostly solitary in the axils, on slender pedicels that are leafy-bracted at base; corolla 1½in. long, with a narrow tube twice the length of the calyx. Summer. *l.* ovate, coarsely serrated, membranous, on slender petioles. *h.* 1½ft. California, 1849. Plant viscidly hirsute.

CALAMOSAGUS. A synonym of **Korthalsia** (which *see*).

CALAMUS. All the 200 species of this genus inhabit tropical or sub-tropical regions; they are mostly found in Eastern Asia. **Dæmonorops** (which *see*) was included here by the authors of the "Genera Plantarum," but has since been separated, and under that genus are now classed *C. accedens* (*D. Draco*), *C. adspersus*, *C. Draco*, *C. fissus*, *C. Hystrix*, *C. Jenkinsianus*, *C. Lewisianus*, and *C. verticillaris.* To those described on p. 235, Vol. I., the following should be added. *See also* **Ancistrophyllum.**

FIG. 194. CALAMUS CILIARIS.

Calamus—*continued.*

C. australis (Southern). *fl.*, panicles long and loose, prickly; male spikes 1in. to 1½in. long; female spikes 3in. to 4in. long. *l.* often above 2ft. long; segments ten to twenty, the lower ones often 1ft. long and 1¼in. broad, the upper ones broader, all shortly acuminate; rachis armed beneath with recurved prickles. Queensland, 1861. "A slender, reclining Palm" (A. Cunningham), "climbing to a great height" (F. Mueller).

C. caryotoides (Caryota-like). *fl.*, inflorescence long and loose, but the partial panicles not loose as in *C. Muelleri*. *l.*, segments much broader than in that species, to which this is allied. Queensland.

C. ciliaris. This very decorative and well-known species, described in Vol. I., is shown at Fig. 194.

C. erectus (erect). *fl.*, spadices 1ft. to 2ft. long, branched, elongated, ending in a flagellum; spikes 6in. to 10in. long; spathels cymbiform. *l.* 12ft. to 18ft. long; leaflets few, linear lanceolate, 1½ft. to 2ft. long, 1½in. to 2in. broad, one-nerved; spines on the full-grown petioles ½in. long and upwards. Stems densely tufted, 12ft. to 18ft. high; internodes 2in. to 3in. long. Sikkim Himalaya, &c. SYN. *C. schizospathus.*

C. gracillimus (very slender). "Foliage very narrow-linear, elongated, spaced at wide distances apart." Habitat not recorded. 1893.

C. grandis (large). A synonym of *Acanthophœnix grandis.*

C. guineënsis (Guinea). *l.* pinnate; segments narrow-lanceolate, supported by spiny leafstalks; young ones cinnamon-brown, changing to deep green. Sikkim, 1884.

C. kentiæformis (Kentia-shaped). "The habit of the plant recalls at once the form and character of *Kentia Forsteriana* [*Howea Forsteriana*], from which circumstance its name was given" (Catalogue of the Compagnie Continentale d'Horticulture, 1884, p. 3). No further description given.

C. Lindeni (Linden's). *l.* pinnatifid; pinnæ unarmed, lanceolate, flat, three-nerved, acuminate, attenuated at base, white-pruinose beneath; petioles and sheaths prickly, the prickles straight, long, brown, thickened at base. Caudex thickened, cylindrical. Indian Archipelago, 1883. (I. H. 1883, t. 499.)

C. Muelleri (Mueller's). *fl.*, main rachis often slender, armed with recurved prickles and bearing a few distant panicles 2in. to 3in. long. *l.* 1ft. to 1½ft. long; segments ten to sixteen, the longest 8in. long and ¾in. broad, all shortly acuminate, the margins having a few minute prickles, the under-surface and rachis occasionally prickly. Stem covered with appressed leaf-sheaths, densely prickly or bristly. Tropical Australia.

C. oblongus (oblong). *fl.*, spadix paniculate. *fr.* pale, cylindrical-oblong, 1in. long. *l.* generally destitute of tendrils; pinnæ scattered, linear-lanceolate, acuminate. Stem climbing. Java, &c., 1857.

C. ovoideus (ovoid). *fr.* ⅝in. to ¾in. long, the spadix having very stout, recurved spikelets. *l.* 14ft. or more in length; leaflets 10in. to 14in. long, ¾in. to 1in. broad, broadly linear, alternate, tricostate, bristly at tip, bright green above, duller beneath; rachis fugaciously scurfy, with hooked spines at back; sheath densely armed with rings of black spines. Stem stout, climbing. Ceylon.

C. Oxleyanus (Oxley's). *l.* 10ft. to 11ft. long exclusive of the long flagellum; leaflets very many, in sub-opposite, distant fascicles, linear-lanceolate, acuminate, 1ft. long, ¾in. broad, five-ribbed; petioles about 2ft. long, stoutly armed (and the sheath excessively so) with large seriate spines and scattered short ones. Malaya.

C. regis (royal). *l.* shining green, borne on mealy petioles. 1886. An elegant and graceful Palm.

C. robustus (robust). *l.* having crowded, ensiform pinnæ; petioles broadly amplexicaul, with brownish-black, membranous margins; spines yellowish-green, disposed in rings of six or eight. Borneo; 1893. (I. H. 1893, t. 169.)

C. Roxburghii (Roxburgh's). A synonym of *C. Rotang.*

C. rudentum (rope-like). *fl.*, male spadix compound; spathe small, prickly. *fr.* oval-globose. *l.* bearing tendrils; pinnæ numerous, equidistant, linear, acuminate; prickles slender. Stem very long, climbing, greyish-white. Amboyna, Java, &c.

C. schizospathus (cut-spathed). A synonym of *C. erectus.*

C. spectabilis (remarkable). *l.* slender, pinnate; pinnæ about five on each side the rachis, not equidistant, oblong, five- to seven-nerved, convex above; petioles very short. 1886. A small-growing, somewhat spiny species, of graceful habit, suitable, when in a young state, for table-decoration.

C. tenuis (slender). The correct name of *C. Royleanus.*

C. trinervis (three-nerved). *l.* pinnate; leaflets alternate, lanceolate, sessile, acuminate, having three prominent, hairy nerves, and two marginal and two intermediate ones less developed; transverse veins conspicuous; petioles thorny, clothed with a deciduous, scale-like tomentum, the sheath ending in a fringe of pointed, brown scales. East Indies, 1883.

Calamus—*continued.*

C. Verschaffeltii (Verschaffelt's). A synonym of *Acanthophœnix rubra.*

C. Alberti, *C. Caroli*, *C. farinosus* (I. H. 1872, t. 109), *C. Laucheanus*, *C. subangulatus*, and *C. Volonteanus* are rare in cultivation.

CALANCHOE. *See* **Kalanchoe.**

CALANDRINIA. About sixty species are included hereunder. To those described on p. 236, Vol. I., the following should be added:

C. elegans (elegant). A garden synonym of *C. discolor.*

C. Lindleyana (Lindley's). A garden synonym of *C. Menziesii.*

C. oppositifolia (opposite-leaved). *fl.* pearly-white, 2in. across, three or four on each stem; petals ten, obtuse, somewhat recurved; scape prostrate, naked. Summer. *l.*, radical ones clustered, 2in. to 4in. long, oblanceolate, obtuse, narrowed into short, thick petioles, green and glistening above, paler beneath. Root fusiform, fleshy. Oregon and California, 1887. Half-hardy perennial. (B. M. 7051; G. C. 1888, p. 601, f. 83.)

C. polyandra (many-anthered). *fl.* reddish-purple, rather large, few together in a terminal raceme. August. *l.* few, thick and fleshy, mostly 1in. to 1½in. long, the lowest broadly linear or almost spathulate, the upper ones narrowly linear. Branches decumbent or ascending. Australia, 1853. SYN. *Talinum polyandrum* (B. M. 4833).

CALANTHE. SYNS. *Amblyglottis*, *Centrosis*, *Ghiesbreghtia*, *Preptanthe*, *Styloglossum.* About forty species, mostly natives of tropical Asia, are comprised in this genus.

The deciduous section includes some of the most useful of winter-flowering Orchids. When grown in a pure atmosphere there are no easier species to manage than these Calanthes. A bright light is essential to their well-being; only sufficient shade is required to prevent the foliage from scorching during the growing season. The fact is, a strong light assists the "bulbs" to properly mature, by hardening the growth in its different stages. Unless a bulb is properly built up flowering will be unsatisfactory, and the well-being of the plant cannot be secured.

In the neighbourhood of London, where fogs and smoky atmosphere are so injurious to plant life in general, the cultivation of this section of Calanthes is practically labour in vain. The unfavourable conditions during the autumn months of the year are such that members of the *C. Veitchii* section (which embrace the darkest forms in cultivation), if fortunate enough to escape destruction before becoming expanded, are so washed out as to colour that they are rendered practically useless. All the winter-flowering section are unable to withstand the effects of even a moderate fog. In the bad state it turns them yellow, and they quickly fall off.

To those described on pp. 236-7, Vol. I., the following should be added:

C. anchorifera (anchor-bearing). *fl.* whitish-ochre; sepals oblong, apiculate; petals very small, rhomboid, obtuse-angled; lateral segments of the lip ligulate, retuse, antrorse, the anterior one bilobed and bent like an anchor; spur filiform; bracts short, velvety; peduncle hairy. Polynesia, 1883.

C. bicolor (two-coloured). A synonym of *C. striata.*

C. biloba (two-lobed). *fl.* numerous, in erect spikes; sepals and petals purplish, with a tinge of yellowish-brown, oblong-lanceolate; lip purple, striped with white, bilobed. *l.* several, large, lanceolate, acute. Pseudo-bulbs cylindrical, elongated. Sikkim, 1839. (W. O. A. iii., t. 378.)

C. bracteosa (bracted). *fl.* white; sepals and petals cuneate-oblong, apiculate; lip with a short isthmus, linear acute lateral segments and a broader anterior one; spur filiform; bracts much developed, sometimes exceeding the flowers. Samoa, 1832.

C. brevicornu (short-horned). *fl.* 1in. to 1½in. across; sepals and petals brownish-purple, with a paler mid-nerve and margin, whitish at base; petals similar to the lateral sepals, but smaller; lip reddish-purple, margined with white; spur very short; racemes many-flowered. August. *l.* oval-oblong or lanceolate, acute, 9in. to 12in. long. Nepal, 1838. (L. S. O., t. 9.)

C. Ceciliæ (Miss Cecilia Weld's). *fl.* light ochre, with a delicate hue of purple; sepals and petals obovate, acute; lip four-cleft, the lateral segments oblong-ligulate, dilated, the middle one subsessile, bifid, the calli very deep yellow; spur slender, filiform. Malayan Peninsula, 1883.

Calanthe—*continued.*

C. Curtisii (Curtis'). *fl.*, sepals and petals rosy outside, white inside, the petals and lateral sepals with rosy borders; lip yellow, with a very short, rather triangular, blunt lobe on each side of the base, the middle segment cuneate, dilated from the narrow base, the callus purple; column white and rosy. *l.* long-petiolate, cuneate-oblong, acute. Sunda Islands, 1884.

C. dipteryx (two-winged). *fl.* suffused rich purple; sepals, rachis, bracts, pedicels, and ovaries puberulous outside; basilar partition of the lip triangular, obtuse, short, scarcely reaching half the breadth of the anterior lacinia; callus purple, in three rows; isthmus very short. Sunda Islands, 1884. Allied to *C. pleichroma.*

C. discolor (two-coloured). *fl.*, sepals and petals claret-coloured, acute; lip white, tinged with pink; scape elongated, racemosely many-flowered. *l.* oblong. Japan, 1837. (B. R. 1840, t. 55.)

C. Foerstermanni (Foerstermann's). *fl.*, sepals and petals yellow, oblong, acute; lip whitish-yellow, reniform, with an apiculus; spur clavate, half the length of the stalked ovary; bracts rather thin, exceeding the flowers; peduncle distantly sheathed, densely racemose at apex. *l.* petiolate, oblong-lanceolate, acute, 3ft. long. Birma, 1883.

C. gracilis (slender). *fl.* greenish-yellow; sepals ½in. to ⅔in. long; lip yellow; column white, short; raceme laxly many-flowered; scape lateral, 8in. to 14in. long. September. *l.* many, 6in. to 12in. long, ovate or lanceolate. Stem 1ft. to 1½ft. high. Khasia Hills and China, 1851. (B. M. 4714.)

C. labrosa (large-lipped). *fl.*, sepals and petals yellow outside, purple within; lip pale purple, with darker spots at base; spur longer than the sepals. *l.* elliptic-lanceolate, acuminate. Pseudo-bulbs 4in. to 8in. long, obpyriform or fusiform, leafing after flowering. Moulmein, 1879. SYN. *Limatodes labrosa.*

C. Langei (Lange's). *fl.* deep yellow, numerous, crowded; dorsal sepal ovate, acute, the lateral ones lanceolate; petals ovate, acute; lip spathulate-obovate, apiculate, with minute deltoid side lobes, and two slight elevations at the base; raceme 3in. to 4in. long; scape shorter than the leaves. *l.* lanceolate, 2ft. long, 2½in. broad. New Caledonia, 1885.

C. natalensis (Natal). *fl.* 1in. to 1½in. in diameter, pale lilac, with a darker, redder lip, or with the sepals and petals white and suffused with lilac towards the margins only; sepals ovate-lanceolate, acuminate; petals shorter and broader; lip about as long as the sepals; raceme 6in. to 8in. long; scape longer than the leaves, erect. *l.* five to seven, all radical, 8in. to 12in. long, 3in. to 5in. broad, elliptic-lanceolate. Natal. Evergreen. (B. M. 6844.) SYN. *C. sylvatica.*

C. Petri is a form of *C. veratrifolia.*

C. proboscidea (snout-like). *fl.* white, changing to lightest ochre, with a few vermilion markings on the lip, the short nail of which descends and the large blade stands at right-angles with it, having four laciniæ; anterior part of the column curved down, like the snout of some insects. Sunda Islands, 1884. Allied to *C. furcata.*

C. rosea (rosy). *fl.* pale rose, shading to white on the lip, which is oblong, flat, retuse; spur straight, obtuse, horizontal; column tomentose; bracts recurved, shorter than the ovary; scape many-flowered, longer than the leaves. *l.* oblong-lanceolate, plicate, glabrous. Pseudo-bulbs fusiform. Moulmein, about 1850. SYN. *Limatodes rosea* (B. M. 5312; F. d. S. xxii., t. 2294; P. F. G. iii. 81).

C. rubens (reddish). *fl.* pink, smaller than in *C. vestita*; dorsal sepal ⅓in. long, mucronate; lip rose-pink, darker at base; raceme about fourteen-flowered; scape 2ft. long, woolly. Pseudo-bulbs 6in. long, 1½in. broad, conical, silvery. Langkawi Island, north of Penang, 1890. (G. C. 1890, vii., p. 576.)

C. Sanderiana (Sander's). *fl.*, sepals and petals pale lilac, shading to lilac-purple at the margin, less than 1in. long; lip rich deep purple with some brown on the crest, three-lobed; racemes many-flowered. *l.* tufted, elliptic-lanceolate, acuminate, 1ft. to 1½ft. long. Eastern tropical Africa, 1892.

C. Sandhurstiana (Sandhurst's). *fl.* deep rose-carmine. A charming hybrid between *C. rosea* and *C. vestita rubro-oculata.* 1884.

C. sanguinaria (bloody). *fl.* dazzling blood-red, the acuminate sepals and the lip being lighter, with blood-red markings, outside pale purple; petals broader than the sepals; middle lobe of lip cuneate, dilated, bilobed; raceme hairy. Pseudo-bulbs hexagonal. 1886. A handsome, seedling form.

C. sanguinea (blood-coloured). *fl.* crimson, the base or "eye" of the lip of an intense crimson outlined with deep rose. 1893. Described as a "grand Calanthe."

C. Sedenii (Seden's). *fl.* large; sepals and petals bright rose; lip the same colour, with a very dark purplish blotch, surrounded by a zone of white, at the base. A hybrid between *C. Veitchii* and *C. vestita rubro-oculata.*

C. Sieboldii. The correct name is *C. striata.*

C. splendens (splendid). *fl.*, sepals and petals rich rosy-red; lip having a distinct crimson or cherry-red shade down the centre. 1893. A hybrid, the parentage of which is not stated.

C. Stevensiana (Stevens'). *fl.* white (changing to buff as they become older), with a rosy-purple spot on the lip; scape erect, hairy, eight- to ten-flowered. Bulbs greyish, stout-jointed. Cochin China, 1833. A pretty species.

C. striata (striated). The correct name of *C. Sieboldii.* (B. M. 7026; L. S. O., t. 9.) SYN. *C. bicolor.*

C. sylvatica (sylvan). A synonym of *C. natalensis.*

C. tricarinata (three keeled). *fl.* 1in. across; sepals whitish, tinged with pale green and rose-pink; petals narrower, the basal half whitish, the apical half stained with rose-pink; lip rose-purple bordered with white, the disk having three white keels; spur obsolete; scape erect, loosely racemose. *l.* broadly oval or oval-oblong, 5in. to 6in. long. Nepal, 1879.

C. Turneri (Turner's). *fl.* pure white, with a deep rose eye, resembling those of *C. vestita*, but more compact, and produced in larger and longer spikes than in that species. Pseudo-bulbs jointed. Java.

C. T. nivalis (snowy). *fl.* wholly white. Birma.

FIG. 195. CALANTHE VERATRIFOLIA.

C. veratrifolia. This time-honoured species, with its bold foliage and erect flower-spikes, is shown at Fig. 195.

C. v. colorans (coloured). *fl.* white; lip changing to ochre, with calli of gamboge-yellow; spur generally bidentate at apex; raceme rather dense, elongated, the rachis, bracts, ovaries, and sepals velvety. India, 1885. (W. O. A. 218.)

C. versicolor (various-coloured). A synonym of *C. Masuca.*

C. vestita Fournieri (Fournier's). *fl.* of a rosy tint, smaller than in the type. 1892. A pretty variety.

C. v. gigantea (gigantic). *fl.* white, large, with a blood-red eye; spike very stout. November to March. Plant larger in all its parts than in the type, retaining its foliage until new growth begins. See Fig. 196.

C. v. luteo-oculata (yellow-eyed). *fl.* white, with a blotch of yellow in the middle of the lip. October to February. (F. d. S. 316; L. J. F. 333; P. M. B. xvi., p. 129; W. S. O. i. 29, upper fig.)

C. v. macroloba (large-lobed). *fl.* pure white, larger and of greater substance than in the type; basilar lobe very broad; lateral calli much developed. May and June. Pacific Islands.

C. v. oculata-gigantea (giant-eyed). A synonym of *C. v. gigantea.*

C. v. porphyrea (porphyry-like). *fl.* wholly blood-crimson, with a deeper-coloured eye.

Calanthe—*continued.*

C. v. Regnierii (Regnier's). *fl.* pure white, with a light ochre lip; lateral laciniæ of the lip divaricate, nearly semi-lunate. Cochin China, 1887. (Gn., xxiv., t. 397.)

C. v. Sanderiana (Sander's). *fl.* disposed in strong, many-flowered spikes; sepals and petals rosy; lip rosy-crimson, similar to that of *C. Regnierii*. Spring. Cochin China.

C. v. Williamsii (Williams'). *fl.*, sepals and petals white, striped and edged with rosy-crimson; lip bright magenta-crimson. 1884. A showy variety. (J. H. 1886, xiii., p. 47, f. 8; W. O. A. iii. 134.)

C. viridi-fusca (fuscous-greenish). A synonym of *Tainea latifolia*.

FIG. 196. FLOWERS OF CALANTHE VESTITA GIGANTEA.

Through the hand of the hybridist many additional varieties have been introduced of late years. It is, however, unfortunate that records of parentage have not in many instances been given, and much confusion exists. The majority of the newer introductions, it is interesting to note, have proved most useful, and in some instances most remarkable.

We append a list of hybrids with their recorded parentage:

Albata	*veratrifolia* and *Cooksonii* (Sander).
Alexanderi	*vestita rubro-oculata* and *Veitchii* (Cookson).
atro-rubens	*William Murray* and *Oakwood Ruby* (Cookson).
Aurora	*Regnierii* and *rosea*.
Barberiana	*vestita and Turnerii* (Barber).
Baron Schröder	*vestita rubro-oculata gigantea* and *Regnierii* (Schröder).
bella	*Turnerii* and *Veitchii* (Veitch).
Bryan	*vestita rubro-oculata* and *Williamsii* (Cookson).
burfordiense	*vestita* and *Veitchii* (Lawrence).
cesta	*vestita nivalis* and *vestita* (Lawrence).
Cooksonii	*Veitchii* and *vestita luteo-oculata* (Cookson).
Darblayana	*Regnierii* and *vestita gigantea* (D'Arblay).
Dominyi	*Masuca* and *furcata* (Veitch).
Eyermanni	*vestita and Veitchii*.
Florence	*bella* and *Veitchii* (Wilshere).
gigas	*Sanderiana* and *vestita rubro-oculata gigantea* (Veitch).
Hallii	*Veitchii* and *vestita rubro-oculata* (Hall).
Harold	*vestita rubro-oculata* and *Veitchii* (Cookson).
Harrisii	*Turnerii* and *Veitchii* (Veitch and Bennett-Poë).
labriosior	unrecorded (Lawrence).
Laucheana	*Sanderiana and veratrifolia*.
lentiginosa	*labrosa and Veitchii*.
Masuca-tricarinata	*Masuca* and *tricarinata* (Veitch).
Moorei	unrecorded (Moore).
Mylesii	*nivalis* and *Veitchii* (Williams).
Oakwood Ruby	*vestita rubro-oculata* and *rosea* (Cookson).

Calanthe—*continued.*

porphyrea	*labrosa* and *vestita rubro-oculata* (Lawrence).
revertens	unrecorded (Lawrence).
Sandhurstiana	*rosea* and *vestita rubro-oculata* (Lawrence).
sanguinaria	*vestita* and *Veitchii* (Lawrence).
Sedenii	*Veitchii* and *vestita rubro-oculata* (Veitch).
Sibyl	unrecorded (Cookson).
splendens	*rosea* and *Bryan* (Cookson).
Veitchii	*rosea* and *vestita* (Veitch).
versicolor	unrecorded (Lawrence).
Victoria Regina	*Veitchii* and *rosea* (Sander).
William Murray	*vestita rubro-oculata* and *Williamsii* (Cookson).

CALANTHE-PHAIO. *See* **Phaio-Calanthe.**

CALATHEA. Upwards of sixty species of this genus have been described; two are natives of Western tropical Africa, and the rest are confined to tropical America. To those described on pp. 237-8, Vol. I., the following should be added. *See also* **Maranta.**

C. bellula (rather pretty). *l.* dark green, festooned with rosy-white along the midrib. Amazons, 1872. SYN. *Maranta bellula*.

C. colorata (coloured). A synonym of *Phrynium coloratum*.

C. cyclophora (wheel-bearing). This is closely allied to *C. zebrina*, but the flowers are white and the leaves green. British Guiana, 1895.

C. inscripta (inscribed). *l.* of an opaque green, decorated with silvery, curved lines. Brazil, 1875. SYN. *Maranta inscripta*.

C. Kummeriana (Kummer's). *l.* dark green, with silvery bands. Brazil, 1875. (B. H. 1875, p. 270, tt. 15-17, f. 1.)

C. Massangeana atrata (dark). *l.* deep olive-green, with light green midrib and secondary veins. 1894.

C. M. florentina (Florentine). *l.* of medium size, bright green, with bands of olive-green and bright silvery veins. 1894.

C. M. metallica (metallic). *l.* of medium size, dark olive-green, with a pale green band along the centre, a green margin, and transverse silvery lines. 1894.

C. Myrosma (Myrosma). A synonym of *Myrosma cannæfolium*.

C. Oppenheimiana (Oppenheim's). *l.* deep green, with white bands. Brazil, 1875. (B. H. 1875, p. 271, f. 3.)

C. picta (painted). *fl.* white, rather longer than the bracts; bracts straw-coloured, margined with red, 1in. to 1¼in. broad, orbicular-obovate; spike cylindric, 4in. long. December. *l.*, lower ones 6in. to 8in. long, oblong or oblong-lanceolate, acuminate, dark green with paler fan-like blotches above, vinous-purple beneath. Stem 3ft. to 4ft. high. Brazil, 1898. (B. M. 7674.)

C. polytricha (many-haired). *fl.* many in a rosette, sessile in the centre of the tuft of leaves; bracts hairy. *l.* green, hairy. Tubers globose. Trinidad, 1894.

C. rufibarba (reddish-bearded). *fl.* golden-yellow, in an oblong spike, long-exserted; corolla lobes linear-oblong; lip bilobed at apex. *l.* on long petioles, biseriate, linear-lanceolate, acuminate, undulated on the margins, violet-tinted beneath. Brazil. Plant stemless. (B. M. 7560.)

C. undulata (waved). *fl.* twin, springing from the base of the inner bracts. *l.* dark green above, with an irregular whitish band along the midrib, purplish beneath, 3¼in. to 4in. long, 1½in. to 2in. broad, oblong-elliptic or nearly elliptic, obtuse. Peru, 1871. Plant dwarf, tufted. (R. G. 1876, t. 852.)

C. vestita (clothed). *fl.* pale yellow, with a long tube, in dense, oblong heads, on stout, hairy peduncles. *l.* broadly lanceolate, 1ft. to 1½ft. long, 3in. to 4in. broad, narrowed to an acute apex and a cuneate base, bright green above, reddish-purple beneath. Bahia, 1872. Plant stemless. (Ref. B. 311.)

C. affinis, *C. angustifolia*, *C. nigro-costata* (I. H. xx., t. 144), *C. picturata*, and *C. tæniosa* (B. H. 1876, p. 83, t. 5), have also been introduced to Continental gardens.

CALATHUS CISTELOIDES. This Ground Beetle is one of those usually carnivorous kinds which forsake their natural diet for one of fruit. It is a black, wingless Beetle, from ⅓in. to ½in. long. The antennæ and wings are more or less red. It is a very common species, and has frequently been found in Strawberry plantations in company with two or three other Ground Beetles. *See* **Strawberry.**

CALCEARIA. A synonym of **Corysanthes** (which *see*).

CALCEOLARIA. Slipper Flower. Including *Jovellana*. This genus embraces nearly 120 species, natives of Western America. Two are also found in New

Calceolaria—*continued.*

Zealand. To those described on pp. 239-40, Vol. I., the following should be added:

C. andina (native of the Andes). *fl.* yellow, disposed in dense, terminal, corymbose panicles; upper lip of the corolla slightly exceeding the calyx, the lower one more than twice as long. April. *l.* ovate, toothed, abruptly narrowed to the petioles, rugose; floral ones small, oblong-lanceolate. Floriferous branches 6in. to 12in. long. *h.* 2ft. Andes of Chili, 1836 and 1893. Half-hardy under-shrub. (B. M. 7326.) SYN. *C. Herbertiana parviflora* (B. R. 1575).

C. arachnoidea-crenatiflora (hybrid). A garden hybrid between the species indicated in the name. 1888.

C. arachnoides alba (white). A variety with white flowers.

C. bellidifolia (Daisy-leaved). *fl.* yellow and red, ¾in. across; lower lip of the corolla large, orbicular. *l.* ovate, entire; radical ones long-petiolate; cauline ones narrowed to a shorter petiole. Stems slender, varying from 2in. to 12in. in length. Andes of Chili, 1861. Hardy perennial.

C. connata (connate). A synonym of *C. petiolaris.*

C. crenata (crenate). *fl.* ample, but smaller than in *C. amplexicaulis* (to which this species is allied); corolla lids nearly closed; panicle loosely sub-corymbose. Summer. *l.* broadly lanceolate, acuminate, 2in. long, crenate and revolute on the margins, pale beneath. Branches slightly viscous-hairy. Quito. Sub-shrub. SYN. *C. floribunda.* (B. M. 4154.)

C. crenatiflora (crenate-flowered). *fl.* yellow, spotted, like those of *C. corymbosa*, but fewer and larger, in a loose corymb. June. *l.*, radical ones petiolate, ample, ovate, denticulate or deeply crenate, cuneate at base; stems few-leaved, villous. Chiloe, 1831. Hardy perennial. The parent of many of our garden forms. (B. M. 3255; B. R. 1609.) SYN. *C. pendula* (S. B. F. G. ser. ii. 155).

C. floribunda (abundant-flowered). A synonym of *C. crenata.*

C. Herbertiana parviflora (Herbert's small-flowered). A synonym of *C. andina.*

C. Kellyana (Kelly's). *fl.* orange-yellow, profusely dotted with brown, 1in. across, borne in twos or threes at the tops of the stems. *l.* Mimulus-like. Stems downy, creeping. 1883. A curious hybrid, well adapted for the rockery.

C. pendula (drooping). A synonym of *C. crenatiflora.*

C. petiolaris (petiolate). *fl.* yellow, with connivent lips, disposed in an ample, loose, flexuous, branched panicle. *l.*, lower ones ovate, narrowed at base to a winged petiole, deeply or doubly toothed, rugose; upper and floral ones broadly cordate, amplexicaul, toothed. *h.* 3ft. Chili, 1824. Biennial or perennial. SYN. *C. connata* (B. M. 2876; L. B. C. 1807).

C. polifolia (Polium-leaved). *fl.* yellow; corolla lips connivent, about twice as long as the calyx; peduncles corymbose. July. *l.* rather thick, scarcely ¼in. long, petiolate, broadly ovate or oblong. *h.* 1ft. Chili, 1827. A white-tomentose under-shrub, much branched at base. (B. R. 1711.)

C. punctata (dotted). *fl.* purple and yellow; lips deeply connate, the upper one thrice as long as the calyx; panicle large, many-flowered. *l.* 2in. to 3in. long, petiolate, ovate, doubly toothed, narrowed at base, pubescent or glabrous, paler beneath. Branchlets lightly pubescent. South Chili, 1863. Shrub. (B. M. 5392.)

C. Sinclairii (Dr. Sinclair's). *fl.* in loose, sub-corymbose heads; corolla pale lilac or flesh-coloured externally, spotted reddish-purple within, ¼in. to ½in. in diameter, between hemispherical and campanulate. June. *l.* membranous, long-petiolate, 2in. to 4in. long, oblong or ovate-oblong, crenate-toothed or lobulate. New Zealand, 1881. A straggling, half-hardy herb. (B. M. 6597.)

Varieties. The yearly improvement in the Calceolaria consists in the production of improved strains from seeds. The improvements are as follow: Plants of a dwarfer habit, a much larger quantity of blossom from a plant, and the flowers themselves richer and more varied in colour, larger in size, and much better formed. When a variety of a distinct colour has been obtained, and its qualities are such that it may fairly be considered a good advance on existing varieties, seeds are saved from it; and if it has been kept free from the influence of foreign pollen the seedlings can be depended upon to be much like the parent. In this way strains of distinct colours are obtained. Named collections are not to be had, as the expense of propagating them from cuttings or offsets is too much to compensate the growers. The plants can be propagated during the summer months most surely by

Calceolaria—*continued.*

layering, while placed in hand-lights or frames on the north side of a wall or fence. From six to a dozen plants may be obtained from one old stool during summer. Cuttings will strike in sandy soil if they are placed in closed hand glasses in autumn.

CALCOA. A synonym of **Geitonoplesium** (which *see*).

CALDASIA HETEROPHYLLA. A synonym of **Bonplandia geminiflora** (which *see*).

CALDCLUVIA. *Dieterica* is synonymous with this monotypic genus.

CALEA (of Gærtner). A synonym of **Neurolæna** (which *see*). *C. aspera* is a synonym of *Melanthera deltoidea.*

CALEACTE. Included under **Calea** (which *see*).

CALEANA. SYN. *Caleya.* The three species of this genus are rarely met with.

CALENDULA. SYN. *Caltha* (of Mœnch). To this genus upwards of a score species have been referred, ranging from the Canary Islands to Persia, and from Central Europe to the Mediterranean; but some of them are now only regarded as varieties. Several plants formerly included hereunder are now classed under **Dimorphotheca.**

C. hybrida (hybrid). A synonym of *Dimorphotheca pluvialis.*

C. officinalis. Of this species there are several improved garden varieties.

CALEYA. A synonym of **Caleana** (which *see*).

CALIFORNIAN NUTMEG. *See* **Torreya californica.**

CALIFORNIAN TULIP. *See* **Calochortus.**

CALIMERIS. Included under **Aster** (which *see*).

CALINEA. Included under **Doliocarpus** (which *see*).

CALIPHRURIA. This genus includes only a couple of species, allied to *Eucharis*, and confined to the Andes. Leaves oblong, petiolate.

C. subedentata. The correct name of the plant so described on p. 241, Vol. I., is *Eucharis subedentata.*

CALLA. Several ornamental garden plants erroneously classed hereunder will be found described under their correct name, **Richardia.**

CALLIANASSA. A synonym of **Isoplexis** (which *see*).

CALLIANDRA. SYN. *Anneslea* (of W. Hooker). Of the eighty species of this genus, one is a native of the East Indies, and the rest are all tropical or sub-tropical American. To those described on p. 242, Vol. I., the following should be added:

C. bicolor (two-coloured). *fl.* nearly glabrous; stamens white at base, purple at apex; peduncles axillary, solitary. *l.*, pinnæ four to six pairs; leaflets many pairs, ¼in. long, oblong-linear, glabrous or ciliated. Young leaves and branches pilose. Uruguay. SYN. *C. diademata* (L. J. F. iii. 305-6).

C. brevipes (short-stalked). *fl.* pink; corolla broadly campanulate; peduncles short, terminal, somewhat fascicled. October. *l.*, pinnæ one pair; leaflets very numerous, ⅛in. to ¼in. long. Brazil. (B. M. 4500; L. J. F. 8.)

C. diademata (diademed). A synonym of *C. bicolor.*

C. gracilis (slender). *fl.* yellowish-white, sessile; heads twenty- to thirty-flowered, on erecto-patent, downy peduncles; stamens thirty to forty, six to eight times as long as the calyx. *l.* short-stalked, abruptly bipinnate; pinnæ two or three pairs; leaflets four to six pairs, ¼in. to 1¼in. long, obovate-oblong, mucronate Colombia, 1870. A copiously-branched shrub. (Ref. B. 294.)

C. hæmatocephala (bloody-headed). *fl.* borne in a small head; calyx and corolla almost concealed by the filaments, which form a ball of scarlet threads. February. *l.* copious, petiolate.

Calliandra—*continued.*

unijugate; each pinna about 5in. long, having seven to ten pairs of opposite pinnules, the lowest and shortest 1in. long. Habitat uncertain, 1857. (B. M. 5181.)

C. tergemina (three-fold). *fl.* white, disposed in globose, pedunculate heads; corolla ½in. long; filaments tipped red. Spring. *l.* one-and-a-half pairs (one of the lower pair abortive), obliquely ovate-oblong, blunt, ½in. to 1in. long. Branches zigzag. Tropical America, 1887.

CALLIANTHEMUM (from *kallos*, beauty, and *anthemon*, a blossom). ORD. *Ranunculaceæ*. A genus embracing what were formerly described as five species of alpine herbs, natives of the mountains of Europe and Asia, but which Sir J. Hooker now regards as mere forms of one. It is a highly glabrous, almost stemless, perennial. Petals ten to fifteen, broad or narrow. Leaves radical, triangular, decompound. Rhizome rather thick. The beautiful variety here described requires similar culture to **Anemone** (which *see*).

C. rutæfolium anemonoides (Rue-leaved, Anemone-like). *fl.* white or pale rose-coloured, 1in. to 1½in. in diameter; sepals five, orbicular; petals ten to fifteen, linear-oblong; peduncle single-flowered, naked, or bearing a small, sessile leaf. March. *l.* long-petiolate, triangular, 5in. across, bipinnatifid; lobes variable. Styria, &c. (B. M. 7603.)

CALLICARPA. SYNS. *Burchardia*, *Spondylococca*. This genus embraces about thirty species, mostly found in Eastern Asia, Malaya, and North Australia; a few are Polynesian, Columbian, and West Indian. To those described on p. 242, Vol. I., the following should be added:

C. cana (hoary). *fl.* purple, in a globose cyme 1in. to 2in. in diameter. *fr.* deep purple, finally black. *l.* broadly elliptic, shortly acuminate at both ends, 4½in. long, 2½in. broad, sharply crenate-toothed, glabrous above, stellate-tomentose beneath. *h.* 3ft. Penang, 1799. Stove shrub. (B. M. 2107.) SYN. *C. tomentosa*.

C. tomentosa (downy). A synonym of *C. cana*.

CALLICOCCA (of Schreber). A synonym of **Cephaelis** (which *see*).

CALLICOMA. *Calycomis* (of Brown) is synonymous with this genus.

CALLICORNIA. A synonym of **Leyssera** (which *see*).

CALLICYSTHUS. A synonym of **Vigna** (which *see*).

CALLIGLOSSA. Included under **Layia** (which *see*).

CALLIGONUM. SYN. *Calliphysa*. Flowers solitary or fascicled, without bracteoles. Leaves alternate, linear or subulate.

CALLIMORPHA DOMINULA. *See* **Tiger Moths.**

CALLIPHRURIA. *See* **Caliphruria.**

CALLIPHYSA. A synonym of **Calligonum** (which *see*).

CALLIPSYCHE. According to J. G. Baker, this genus consists of only the three species described on p. 242, Vol. I., all of which are found on the Andes. Flowers, many in an umbel; perianth funnel-shaped, the tube short, the segments equal, oblanceolate-oblong; stamens affixed at the throat of the perianth, much exserted; peduncle hollow; spathe valves ovate-lanceolate. Leaves thin, oblong, petiolate.

CALLIRHOË. Seven species of this genus are known. Calyx five-cleft; petals purplish, pink, or white, cuneiform, truncate, and often fimbriate-denticulate. Leaves mostly lobed or parted. To the species described on p. 243, Vol I., the following should now be added:

C. alcæoides (Alcæa-like). *fl.* rose-coloured, or white, corymbose, on slender peduncles; involucel none. *l.*, lower ones triangular-cordate, incised; upper ones five- to seven-parted, laciniate; uppermost ones divided into linear segments. Stems slender,

Callirhoë—*continued.*

1ft. high, from a perennial root. North America. SYNS. *C. macrorhiza*, *Sida alcæoides*. There are garden forms of this varying from pure white to purplish-carmine.

C. involucrata linearifloba (linear-lobed). *fl.*, petals lilac in the centre, margined white on each side, broad, obcuneate. *l.* pedately-parted, dark green, roundish in outline, cut in a bipinnatifid manner almost to the base into narrow lobes ¼in. wide. Stems numerous, trailing. Texas, 1884.

C. macrorhiza (large-rooted). A synonym of *C. alcæoides*.

C. pedata compacta (compact). A compact, garden variety, having flowers of a delicate blush. 1887. (R. G. 1224.)

C. p. nana (dwarf). A dwarfer and much more floriferous plant than the type.

C. spicata (spiked). A synonym of *Sidalcea malvæflora*.

CALLISIA (from *kallos*, beauty). ORD. *Commelinaceæ*. A small genus (four species) of slender, creeping, stove herbs, natives of tropical America, allied to *Tradescantia*. Flowers small, usually cymose; sepals and petals distinct; stamens free; bracts sometimes linear and scariose, sometimes very small or even obsolete. Leaves ovate, acute, or elliptic-lanceolate, the upper ones almost sessile, ochreous. Stem ascending, simple or paniculately branched above. *C. Martensiana*, the only species calling for mention here, thrives in a compost of sandy loam and peat, and may be propagated by divisions of the creeping stem.

C. Martensiana (Martens'). *fl.* white, three-parted; panicle effuse, dichotomous; umbels often compound. *l.* 1¾in. long, ¾in. broad, elliptic-lanceolate, sub-sessile, pubescent beneath. Stems 1ft. to 1½ft. long, branched above. Mexico and Guatemala. Plant exhaling a sweet, Violet-like odour. SYN. *Tradescantia Martensiana* (B. M. 4849).

CALLISTA. A synonym of **Dendrobium** (which *see*).

CALLISTEMON. Including *Metrosideros* (in part). Of the dozen species included in this genus one or two are natives of New Caledonia, and the rest are Australian. To those described on p. 243, Vol. I., the following should be added. One or two formerly included here are now referred to **Kunzea**.

C. lanceolatus (lance-shaped). *fl.* in not very dense spikes 2in. to 4in. long; petals greenish or reddish, ¼in. long; stamens red, 1in. long. June. *l.* lanceolate, 1in. to 3in. long, variable in breadth. *h.* variable. Australia, 1788. SYNS. *C. scaber* (L. B. C. 1283), *Metrosideros citrina* (B. M. 260), *M. lophantha*, *M. semperflorens* (L. B. C. 523).

C. macrostachyum (large-spiked). A synonym of *Kunzea Baxteri*.

C. scaber (rough). A synonym of *C. lanceolatus*.

CALLISTEPHUS. The China Asters show considerable advance. Old favourites like Pæony Perfection, Victoria, Chrysanthemum-Flowered, and Bouquet have been still further improved by the florists, until it looks as if perfection as regards form of flower and compactness of growth had been reached; while several noteworthy additions to the different sections have also been made. The best are:

Comet or **Plume.*** This is a very distinct and beautiful section, characterised by flowers having beautifully-curled petals, reminding one forcibly of Japanese Chrysanthemums. The colour-shades are numerous, and include white, crimson, purple, rose, and soft blues. *h.* from 10in. to 1ft. Then there are the Giant Comets, which attain a height of 15in.

Singles. These have a free and branching habit, pretty, rich foliage, and very large flowers, having but a single row of petals. The best is Sinensis, bearing delicate pale mauve flowers. This is an excellent subject for the mixed border.

CALLITHAUMA. Included under **Stenomesson** (which *see*).

CALLITRIS. *See also* **Widdringtonia.** *C. quadrivalvis* is the Sandarach Gum-tree.

CALLUS. *See also* **Calli,** on p. 242, Vol. I.

CALOBOTRYA. Included under **Ribes** (which *see*).

CALOCEPHALUS (from *kalos*, beautiful, and *kephale*, a head; alluding to the inflorescence). Including *Leucophyta*. ORD. *Compositæ*. A genus embracing about ten species of greenhouse, usually cottony or woolly, annual or perennial herbs, rarely sub-shrubs or small shrubs, natives of Australia. Flower-heads numerous and usually more or less stipitate on a small and branching or globose or conical receptacle, in an ovoid or globular, dense cluster or compound head, without any involucre, or surrounded by a few bracts rarely exceeding the florets; partial heads two- or more-flowered; receptacle without scales; florets five-toothed. Leaves alternate or (in two species) opposite, entire. *C. Brownii* is the only species grown in our gardens. It is much used in carpet-bedding arrangements, and thrives in almost any soil. Propagation may be effected by means of cuttings, inserted under a bell-glass, in a cool greenhouse or frame, and wintered in any light, dry structure, free from frost.

C. Brownii (Brown's). *fl.* in globular clusters four to six lines in diameter, surrounded by a few floral leaves. *l.* alternate, linear, obtuse, two lines or less in length. *h.* 1ft. A rigid, woolly-tomentose shrub. SYN. *Leucophyta Brownii.*

CALOCHORTUS. Wild Tulip of California. SYN. *Cyclobothra*. Baker enumerates twenty-one, and S. Watson thirty-two, species of this genus, natives of North (mostly Western) America, extending as far as Mexico. To those described on p. 245, Vol. I., the following should be added:

C. amœnus (pleasing). *fl.* deep rosy-pink or purple. July. *l.* lanceolate, vigorous. 1892. Intermediate in habit between *C. albus* and *C. pulchellus*. SYN. *Cyclobothra amœna.*

C. apiculatus (apiculate). *fl.* straw-coloured; perianth broadly funnel-shaped, erect, the segments acute, eight to nine lines long. *l.* solitary, flat, linear, 6in. to 12in. long. Stem 1ft. to 1½ft. high, one- to nine-headed. British Columbia.

C. a. minor (lesser). *fl.* cream-coloured, fringed with yellow hairs in the centre.

C. Bonplandianus (Bonpland's). The correct name of *C. purpureus.*

C. citrinus (Citron-coloured). A synonym of *C. Weedii.*

C. clavatus (club-shaped). *fl.* golden-yellow, tinged or lined with brown, large, widely expanded; lower half of the perianth segments covered with strongly clavate hairs; anthers deep purple. Stems much branched. California, 1897. Allied to *C. luteus*. (B. M. 7606.)

C. flavus (yellow). *fl.* yellow, upright; perianth segments rhombic-oblong, acute, the inner ones hairy and usually denticulate, curving outwards, ⅝in. to 1in. long. *l.* below the fork two or three, linear, long-acuminate, 9in. to 12in. long. Stem 1ft. to 2ft. long, slender, often deeply forked, with erecto-patent branches. Oaxaca, &c. Not quite hardy. (B. iv., t. 170.) SYNS. *C. pallidus, Cyclobothra barbata* (S. B. F. G. 273), *Cyclobothra lutea* (B. R. 1663).

C. flexuosus (bending). *fl.* pure lilac; inner perianth segments paler below, slightly hairy or dotted around the brown or orange gland, 1in. to 1¼in. long; bracts linear-lanceolate, ½in. to 1¼in. long. Stem stout, more or less flexuous, branching, not bulbiferous. Southern Utah.

C. Greenei (Rev. E. L. Greene's). *fl.* clear lilac, barred below with yellow and purple, and loosely covered with long hairs; gland densely villous; bracts elongated. June. *l.* 1in. broad, glaucous-green, acute. Stem stout, branching, two- to five-flowered, 1ft. or more in height. California. A handsome species.

C. Gunnisoni Krelaagi (Krelaag's). *fl.* yellow, white, green, and black. California, 1873. A garden variety.

C. Howellii (Howell's). *fl.* creamy-white, very handsome, about 1in. across; inner perianth segments having a dark brown beard on the lower half. Summer. *l.* long, shining. Oregon, 1890. A showy species.

C. Kennedyi (Kennedy's). *fl.* reddish-orange or bright scarlet, not ciliated or hairy, or only slightly so upon a broad, deep purple spot surrounding the densely-hairy gland. July. *l.* linear. Stem two- to four-flowered, usually stout. Southern California, 1892. (B. M. 7264.)

C. longebarbatus (long-bearded). *fl.* one to three, pale purple-lilac, 1¼in. across, with a dark purple stripe across the base of each segment and a beard 1in. long above it. July. Stems 1ft. high. Oregon and Washington, 1890.

C. luteus citrinus (Citron-yellow). *fl.* wholly of a rich lemon-yellow, with a central, circular or tranverse, brownish-purple blotch. (Gn. 1884, p. 437.) SYN. *C. venustus citrinus.*

C. l. concolor (self-coloured). *fl.* of a rich yellow, slightly marked with chestnut-red at the base of the segments. 1895.

Calochortus—*continued.*

A variety of sturdy growth, much branched, and many-flowered. (Gn. 1895, xlviii., t. 1043.)

C. l. Weedii (Weed's). This is regarded by S. Watson as a distinct species.

C. Lyoni (Lyon's). *fl.* pale lilac when opening, but shading to almost white, with dark velvety-brown blotches at the base, large and numerous. Probably California, 1895. One of the earliest-flowering species.

C. madrensis (Sierra Madre). *fl.* bright orange-yellow, with a band of deep orange hairs at the base of each segment, several in a loose head to each stem. August and September. Stem 9in. high at the utmost. North America, 1890. (G. C. 1890, viii., p. 391, f. 78.)

C. Maweanus major (greater). A large-flowered variety.

C. nitidus (shining). *fl.* white or cream-coloured, open-campanulate; outer perianth segments 1¼in. to 1½in. long; inner ones having a lilac or indigo spot in the centre, sparingly hairy below. August. *l.* two or three, narrow-linear, acuminate, ascending, 6in. to 9in. long, three lines broad at base. Stem umbellately one- to three-flowered, 1½ft. to 2ft. high, shortly bracteate in the middle. Oregon, 1826.

FIG. 197. CALOCHORTUS VENUSTUS

C. obispoensis (San Luis Obispo). *fl.*, outer perianth segments orange and purple on a greenish-yellow ground; inner ones lemon-yellow, orange towards the base, tipped with reddish-brown, covered with long, dark hairs, usually cleft at the summit; anthers orange. *l.* narrow, acute, convolute. Stem sparingly branched, 1ft. to 2ft. high. California, 1889. A distinct species. (G. & F. 1889, p. 160, f. 101.)

C. pallidus (pale). A synonym of *C. flavus.*

C. Palmeri (Palmer's). *fl.*, outer perianth segments spotted, recurved at tip; inner ones white (or yellowish below), with a brownish claw and with scattered hairs round the broad, densely hairy gland. Stem very slender, lax and flexuous, 1ft. to 2ft. high, one- to seven-flowered, bulbiferous near the base. California.

C. Plummeræ (Mrs. Plummer's). *fl.* of a very delicate shade of lilac with a satin-like sheen, as much as 4in. across, the inner perianth segments clothed at the base with yellow hairs. *l.* about 2ft. long, broad. Stem strong, branching, many-flowered. California, 1894. A near ally, and possibly a variety, of *C. venustus*. (G. C. 1894, xvi., p. 133, f. 21.)

C. P. aurea (golden). *fl.* golden-yellow, with an irregular, scarlet marking across the segments, and crimson and scarlet dots among the golden hairs. 1897.

C. pulchellus parviflorus (small-flowered). A variety with smaller flowers than in the typical Golden Star Tulip. 1875.

Calochortus—*continued.*

C. Purdyi (Purdy's). *fl.* white, with claret-purple stains at the base and a blotch of the same colour, covered on the inner surface of the segments with silky hairs, which are white, ¼in. long, but deep claret-purple at the base of the segments. *l.* long, linear, bright green, glabrous. *h.* 10in. Habitat not recorded, 1898. A very interesting species.

C. Tolmiei (Tolmie's). *fl.* tubular, tinged or marked with lilac, covered and fringed with purple and white hairs; inner perianth segments ⅔in. to 1¼in. long. Stem stouter and taller than in *C. cæruleus* (to which this species is allied). Oregon.

C. uniflorus (one-flowered). *fl.* pale lilac with a purplish claw, erect, the lower half of the inner perianth segments ⅔in. to 1in. long, hairy above the small, purple, densely hairy gland; peduncle naked, 2in. to 5in. long. *l.* three or four, linear. Stem slender, 3in. to 6in. long, usually one- (but sometimes two-) flowered. California, 1868.

C. uniflorus (of Hooker). A synonym of *C. lilacinus.*

C. venustus. This species and its varieties are still amongst the most attractive of the genus. See Fig. 197.

C. venustus citrinus (Citron-coloured). A synonym of *C. luteus citrinus.*

C. v. oculatus (eyed). *fl.* white, large, each segment marked in the centre with a bright red blotch. 1893.

C. v. pictus (painted). *fl.* white, with rosy spots at the base and a brown blotch on each segment, smaller than in the type. California, 1895.

C. v. roseus (rose-coloured). *fl.* white inside, with a distinct red spot on each segment, purplish-rose outside. *l.* short, bluish-green. 1886. Another variety is *purpurascens* (purplish).

C. Weedii (Weed's). *fl.* deep yellow, dotted and often margined with purple, 1in. or more in length, covered with slender hairs and ciliated; sepals with a slightly hairy, brown spot. Summer. *l.* convolute. Stems leafy, 1ft. high, two- or three-flowered. California, 1875. (G. C. 1894, xvi., p. 183, f. 27.) SYN. *C. citrinus* (B. M. 6200), *C. luteus Weedii.*

CALODENDRON. *Pallasia* (of Houttuyn) is synonymous with this genus.

CALOMERIA. A synonym of **Humea** (which *see*).

CALONNEA. A synonym of **Gaillardia** (which *see*).

CALOPETALON. Included under **Marianthus** (which *see*).

CALOPHACA. About seven species of greenhouse or hardy, perennial herbs, shrubs, or under-shrubs, natives of Asiatic Russia, the Orient, and the Western Provinces of India, are included in this genus. Flowers yellow or violet, few, rather large. Leaves impari-pinnate; leaflets entire, exstipellate.

These plants delight in a mixture of good fibrous loam and leaf-mould. Perfect drainage and an open situation are essential to their successful cultivation. When seeds are procurable they should be sown in heat in spring, and when the seedlings are large enough to handle they should be pricked off into shallow boxes or pans of light soil, and grown on in cold frames until ready for planting out in the open ground. The best time for grafting on stocks of the common Laburnum is in spring before growth commences. Grafting may be done out of doors or under glass. The latter method is the quicker and more certain of the two.

C. grandiflora (large-flowered). *fl.*, calyx five-cleft; corolla golden-yellow, papilionaceous, 1in. long; peduncles axillary and, together with the raceme, exceeding the leaves. June and July. *l.* 2½in. to 8in. long; leaflets ovate, shortly petiolulate, ¼in. to nearly 1in. long, entire. 1886. (R. G. 1231.)

CALOPOGON. SYN. *Cathea.* This genus comprises four closely-related species of hardy, terrestrial Orchids, natives of North America. To those described on p. 246, Vol. I., the following should be added:

C. multiflorus (many-flowered). *fl.* amethyst-purple; stalk of the lip having on each side of the base an auricle, the broad, irregularly square, retuse, emarginate, anterior blade having at the base a tuft of golden-yellow, hairy lamellæ, often purplish at base, and before these some purple calli; peduncle five-flowered. 1884.

CALOSACME. A synonym of **Chirita** (which *see*).

CALOSANTHUS. A synonym of **Oroxylum** (which *see*).

CALOSTEMMA. Only the three species described on p. 247, Vol. I., are referred to this genus, and all are Australian. They should be grown in a compost of sandy loam and leaf-mould, the former preponderating. Propagation is effected by offsets.

C. purpureum (B. R. 422; F. d. S. 1135). Of this there is a variety *carneum*, having pale purple or white flowers, rather larger than in the type. (B. R. 1840, t. 26.)

CALOTHAMNUS. SYN. *Billottia* (of Colla). Twenty-two species, confined to Western Australia, are included in this genus. Flowers in lateral clusters or spikes, usually turned to one side, immersed in the rachis when young, and either protruding and free from the time of flowering, or remaining immersed till the seed becomes mature.

CALPURNIA (named in honour of Titus Julius Calpurnius, an imitator of Virgil; this genus being nearly allied to *Virgilia*). ORD. *Leguminosæ.* A genus comprising about half-a-dozen species of greenhouse trees or shrubs, confined to South Africa. Flowers yellow; calyx shortly five-cleft; standard erect; wings oblong; keel incurved, bifid; stamens ten; racemes axillary and terminal, the peduncles often paniculate. Leaves impari-pinnate, with many leaflets. The species introduced thrive in a compost of peat and loam. Propagation may be effected by means of cuttings of half-ripened shoots, inserted in sand, under a bell-glass, in April; or by seeds, sown on a gentle hot-bed.

C. intrusa (intruded). *fl.* scarcely ¼in. long; calyx intruse at base; peduncles flexuous, much longer than the leaves. May to August. *l.*, leaflets ten to fourteen pairs, glabrescent, elliptical, mucronate. 1790. SYN. *Virgilia intrusa.*

C. lasiogyne (having a silky ovary). Natal Laburnum. *fl.* like those of Laburnum; ovary silky with short, white hairs. *l.*, leaflets four to ten pairs, elliptical, obtuse or retuse, thinly pubescent beneath. 1890.

CALTHA. This genus embraces about nine species, distributed over the temperate and frigid regions of the globe. To those described on p. 247, Vol. I., the following variety should be added:

C. alpina (alpine).* *fl.* of a rich orange-yellow, larger than in *C. palustris* (of which this plant is probably a variety), produced in great profusion. April and May. *l.*, radical ones sub-orbicular or reniform, with crenate margins; cauline ones roundish-cordate, coarsely toothed, sessile. *h.* 1ft. to 1½ft. Transylvania, 1892. A decided acquisition to the bog garden.

C. ficarioides (Ficaria-like). A synonym of *C. palustris parnassifolia.*

CALTHA (of Mœnch). A synonym of **Calendula** (which *see*).

CALVARY CLOVER. *See* **Medicago Echinus.**

CALYCANTHUS PRÆCOX. A synonym of **Chimonanthus fragrans** (which *see*). *Calycanthus fertilis* is identical with *C. glaucus.*

CALYCEREÆ. A small natural order (about a score species) of extra-tropical, South American, dwarf or procumbent herbs, ranking between *Dipsaceæ* and *Compositæ*; they are of botanical interest only.

CALYCIUM. A synonym of **Heterotheca** (which *see*).

CALYCOMIS (of Brown). A synonym of **Callicoma** (which *see*).

CALYCOMIS (of Don). A synonym of **Acrophyllum** (which *see*).

CALYCOPTERIS (from *kalyx, kalykos*, a calyx, and *pteron*, a wing; alluding to the enlarged calyx lobes when the plants are in fruit). SYN. *Getonia.* ORD. *Combretaceæ.* A monotypic genus. The species, *C. floribunda* (SYNS. *C. nutans, Getonia floribunda*), is a diffuse, stove shrub, allied to *Terminalia*, probably no longer in cultivation.

CALYCOSTEMMA. Included under **Isoloma** (which *see*).

CALYCOTHRIX. A synonym of **Calythrix** (which *see*).

CALYCOTOME. A synonym of **Dichilus** (which *see*).

CALYDERMOS (of Ruiz and Pavon). A synonym of **Nicandra** (which *see*).

CALYDOREA (from *kallos*, beautiful, and *dorea*, a gift). SYN. *Botherbe.* ORD. *Irideæ.* A genus embracing about ten species of stove or greenhouse plants, with corm rootstocks, natives of the warmer parts of America. Flowers blue or yellow, very fugitive; perianth segments spreading; stamens inserted at the base of the segments; clusters one or more, pedunculate. Root-leaves terete or narrow-linear. Only one species calls for mention here. For culture, *see* **Glycine.**

C. speciosa (showy). Tahay. *fl.*, perianth-segments blue, yellow at base, obovate-cuneate, 1in. long; spathe 1in. to 2in. long; stems one-headed, 3in. to 9in. long, with two or three reduced leaves. June. *l.*, radical ones narrow-linear, plicate, 3in. to 9in. long. Bulb globose, ¾in. in diameter, edible. Chili, 1836. SYN. *Sisyrinchium speciosum* (B. M. 3544).

CALYMENIA. A synonym of **Oxybaphus** (which *see*).

CALYPLECTUS. A synonym of **Lafoënsia** (which *see*).

CALYPSO. *Cytherea*, *Norna*, and *Orchidium* are synonymous with this monotypic genus.

CALYPTROCALYX. Two species of unarmed, stove Palms, with slender stems, natives of Amboyna and Australia, are included in this genus. Flowers arranged as in *Cyphophœnix*, the males rather large; spadices very long, simple, pendulous, rather thick, long-pedunculate, solitary or twin; spathe solitary, complete, shorter than the spadix, deciduous. Fruit mediocre or rather large, ovoid or olive-shaped, one-celled. Leaves terminal, equally pinnatisect; segments linear-lanceolate, the midrib and nerves prominent beneath.

CALYPTROGYNE. This genus comprises six or eight species, natives of tropical America. Spadices simple or branched from the base, long-pedunculate; spathes two, narrow, the lower one much shorter than the peduncle, cleft at apex, the upper one deciduous, elongated, cleft the whole length. Fruit small, oblong or obovoid, one-seeded. Leaves terminal, unequally pinnatisect; segments in few pairs; petioles very short. To the species described on p. 249, Vol. I., the following should be added:

C. teres (terete). *l.* spreading or drooping, consisting, in young plants, of two pairs of linear-oblong, tapered leaflets about 2in. wide, bright green, with the principal ribs raised; petioles terete. British Guiana. Stove.

CALYPTROON. A synonym of **Baccaurea** (which *see*).

CALYPTROSPERMUM. A synonym of **Menodora** (which *see*).

CALYPTROSTIGMA. A synonym of **Diervilla** (which *see*).

CALYSACCION. A synonym of **Ochrocarpus** (which *see*).

CALYSPHYRUM. A synonym of **Diervilla** (which *see*).

CALYSTEGIA. The seven or eight species of this genus are broadly distributed over temperate and sub-tropical regions. Bracts two, ample, persistent. Leaves alternate entire or rarely palmately lobed. To the species described on p. 249, Vol. I., the following should be added:

C. silvatica (wood-loving). *fl.*, corolla white, showy, campanulate; bracts large, rounded-ovate. July. *l.* cordate-sagittate, sinuate, obtuse, ample, on long petioles. Stems angular, smooth. Hungary, North Africa, &c., 1815. A vigorous and charming twiner for the wild garden. SYN. *Convolvulus sylvaticus.* There is also a pink-flowered form, *incarnata.*

CALYTHRIX. [also spelt *Calytrix*]. SYN. *Calycothrix.* There are thirty-five species of this genus.

C. virgata (twiggy). A synonym of *C. tetragona.* (B. M. 3323.)

CALYTRIX. *See* **Calythrix.**

CALYXHYMENIA. A synonym of **Oxybaphus** (which *see*).

CAMARIDIUM. About a dozen species of stove, epiphytal Orchids, natives of tropical America, are included in this genus. Flowers mediocre, solitary, produced from the axils of the distichous leaves. To the species described on p. 249, Vol. I., the following should be added:

C. Lawrenceanum (Sir Trevor Lawrence's). *fl.*, sepals and petals yellowish-white, the former spotted with reddish-purple, most distinctly on the back; lip deep, dark purple, yellowish-white at apex, ¼in. long; column yellowish-white, with a purple stigma; peduncles axillary, one-flowered. *l.* 1½in. to 3in. long, linear, obtuse. Pseudo-bulbs distant, elliptic-oblong, compressed, two-leaved at apex. Habitat not recorded, 1894.

CAMASSIA. SYN. *Cyanotris.* This genus now embraces five species, all North American. To those described on p. 250, Vol. I., the following should be added:

C. Cusickii (Cusick's). *fl.* pale blue, 1½in. in diameter; perianth segments narrow-oblanceolate, obtuse; raceme long, moderately dense. *l.* glaucous, slightly wavy, 1½ft. to 2ft. long, 1½in. broad. Stem 2ft. to 3ft. high. Bulbs large, clustered. Oregon, 1888. A showy species. (G. & F. 1888, i., 172, 174, f. 32.)

C. Engelmanni (Engelmann's). *fl.* bright blue; perianth segments not so distinctly nerved as in the other species; raceme lax. *l.* 8in. to 12in. long, about 1½in. broad, glaucous above. Bulbs much larger than in the other species. Rocky Mountains, 1889.

CAMBOGIA. A synonym of **Garcinia** (which *see*).

CAMELLIA. Of recent years Camellias have suffered somewhat in popularity. Many have given up their cultivation because of the stiffness or formality of the flowers; but a few novelties, chiefly from Japan, have a distinct and beautiful appearance, being in most instances single or semi-double, and deserving of attention for conservatory decoration or the covering of back walls of cool houses or corridors, for which they are well adapted. Some of the more desirable varieties are as follow:

Singles and Semi-Doubles.—ADELINA PATTI, single petals soft pink, anthers bright yellow; EMIN PASHA, semi-double, petals deep crimson, anthers yellow; GERALD WALLER, not quite double, petals soft carmine, and lightly speckled with a paler shade, anthers yellow; HOTOKE, a charming single white, with deep yellow anthers; LADY ARDILAUN, pure white, with a pretty Anemone-like centre; MRS. LADE, double white, of perfect form; NAGASKI, semi-double, bright carmine petals; TAKAYAMA, petals rich scarlet, a small-flowered, attractive variety; THE DAIMIO, single crimson, with large yellow anthers; THE MIKADO, semi-double, petals crimson, margined with white. The following are also excellent: JAPONICA AITONII, red, large flower; J. ALBA, white, and very floriferous; J. BICOLOR, white, delicately striped with rose; J. CARNESCENS, rose, large flower; J. RUBRA, brick red.

Doubles.—The list of the double-flowering varieties in Vol. I. is so good that it is scarcely necessary to add to their number. It will suffice to mention JUBILEE, flowers of the largest size, with imbricated petals, white, marbled with rose, and SASANQUA ALBA, white, which, unlike most varieties, possesses a fragrance.

CAMELLIA SCALE. *See* **Scale Insects.**

CAMERARIA DUBIA. A synonym of **Wrightia dubia** (which *see*).

CAMPANEA. Includes *Capanea.* This genus embraces six species of softly-villous shrubs, found only in tropical America. Flowers usually pink or white, purple-spotted within, large; calyx broadly campanulate, with five almost leaf-like lobes; corolla tube ample, the limb oblique, with five almost equal lobes; stamens affixed at the base of the corolla, slightly exserted; peduncles axillary, somewhat umbellately many-flowered at apex. Leaves opposite, soft. To the species described on p. 253, Vol. I., the following should be added:

C. Humboldtii (Humboldt's). *fl.* densely tomentose outside, densely spotted within, otherwise as in *C. Oerstedii*; peduncles

Campanea—*continued.*

two- or three-flowered. *l.* obliquely oblong, unequal, long-acuminate, serrated, as much as 9in. long and 3in. broad, densely tomentose above, slightly villous beneath. Stem as in *C. Oerstedii*, but 3ft. long. Costa Rica, 1853. SYN. *Rhytidophyllum Humboldtii.*

C. Oerstedii (Oersted's). *fl.*, calyx villous; corolla greenish, spotted with dark violet, 1½in. long, the tube inflated and curved, the limb 1in. across; peduncles nearly twice as long as the leaves, three- to five-flowered. *l.* obliquely oblong or ovate, slenderly acuminate, serrated, 3in. to 7in. long, 1in. to 2½in. broad; petioles ½in. to 1in. long. Stem 2ft. long, rooting. Costa Rica, 1852. SYN. *Rhytidophyllum Oerstedii.*

CAMPANULA. About 230 species have been referred to this genus; they are broadly dispersed over the Northern hemisphere, being very copious in the Mediterranean region. Calyx tube adnate, the limb deeply five-cleft or five-parted; corolla campanulate, rarely funnel-shaped or sub-rotate, short, five-cleft to the middle or rarely nearly to the base; stamens free of the corolla, the filaments often dilated at base, the anthers free. To the species described on pp. 253-8, Vol. I., the following should be added. A few plants formerly included hereunder are now referred to **Adenophora, Musschia, Platycodon, Prismatocarpus, Specularia, Symphyandra,** and **Wahlenbergia.**

Campanulas, especially the perennial kinds, are some of the most useful of hardy flowers. They have not a wide colour-range, but they make up for this deficiency by furnishing gardens with some of the most beautiful blue shades imaginable. Again, they are most accommodating, and any ordinary border will suit the tall-growing kinds,

FIG. 198. CAMPANULA PERSICÆFOLIA AND WHITE VARIETY.

Campanula—*continued.*

of which the lovely forms of *C. persicæfolia* (Fig. 198), the hybrid *C. Burghalti*, the double-flowered varieties of *C. Trachelium*, the time-honoured Chimney Bellflower (*C. pyramidalis*), and *C. glomerata* are amongst the best.

For the rockery there is a delightful section, embracing the well-known *C. Portenschlagiana*, *C. valdensis*, *C. turbinata*, the pretty trailing *C. isophylla* and *C. i. alba*, and a host of others. The last, together with *C. fragilis*, are favourite subjects for hanging-baskets and for window-plants. Others, like *C. rapunculoides* (a native plant), are worthy of a place in the wild garden.

FIG. 199. CAMPANULA MEDIUM CALYCANTHEMA.

C. abietina (Abies-like). *fl.* light blue; spikes loose, branching. July and August. Stems slender, 9in. to 15in. high. Eastern Europe. Plant tufted.

C. alliariæfolia (Alliaria-leaved). *fl.* creamy-white, nodding, very shortly pedunculate; corolla hairy, infundibular-campanulate, four or five times longer than the calyx. June and July. *l.* pubescent above, hoary beneath; lower ones long-petiolate, ovate-cordate or reniform, crenate-toothed; upper ones much smaller, sessile, ovate. Orient, 1803. SYNS. *C. lamiifolia*, *C. macrophylla* (B. M. 912).

C. autumnalis (autumnal). A synonym of *Platycodon grandiflorum.*

C. Balchiniana (Balchin's). *fl.* of a soft pale blue, 1in. to 1½in. across. *l.* profusely variegated with creamy-white and pale green. 1896. A beautiful hybrid between *C. fragilis* and *C. isophylla alba.*

C. Burghalti (Burghalt's). *See* **C. Van Houttei.**

C. Calycanthema (calyx-flowered). A variety of *C. Medium.*

C. elegans (elegant). *fl.* blue, pendent, shortly pedicellate, disposed in a long, terminal spike; corolla about 1½in. long. June and July. *l.* ovate-lanceolate, acute, sub-triangular, rounded or cordate at base, irregularly toothed; radical ones long-petiolate. *h.* 2½ft. to 3ft. Siberia.

C. garganica hirsuta (hairy). *fl.* very profuse; sepals rather longer and somewhat narrower than in the type; corolla purplish-blue, pale towards the base, saucer-shaped. *l.* (as well as the stem) densely covered with longish, stiff, white hairs. Flowering branches longer and slenderer than in the species. Habit dwarf and more trailing. An excellent plant for hanging baskets, flower-boxes, brackets in corridors, &c.

C. glomerata dahurica (Dahurian). This appears to be merely a dwarf, proliferous form of the species. 1883.

C. Grossekii (Grossek's). *fl.* violet, large, campanulate, disposed in a long raceme. *l.* large, cordate-lanceolate, acuminate, the margins coarsely toothed. Stems leafy, 2½ft. high, branching at base. Eastern Europe, 1886. A handsome plant. (R. G. 1886, p. 477, f. 55.)

C. Hendersoni (Henderson's). A variety of *C. carpathica.*

Campanula—*continued.*

C. Jacobæa (St. James's). *fl.* axillary, on curved pedicels 1½in. to 2½in. long; calyx segments narrow-lanceolate, ½in. to ¾in. long; corolla deep blue or pale greenish, campanulate, 1in. to 1½in. long. March. *l.* 1½in. to 2½in. long, sessile or nearly so, oblong-ovate or obovate-oblong, obtuse or sub-acute, narrowed at base; upper ones cordate, half-amplexicaul. *h.* 2ft. to 3ft. Cape de Verde, 1882. Half-hardy under-shrub. (B. M. 6703.)

C. lamiifolia (Lamium-leaved). A synonym of *C. alliariæfolia.*

C. macrantha (large-flowered). A hybrid form of *C. latifolia.*

C. macrophylla (large-leaved). A synonym of *C. alliariæfolia.*

C. Medium Calycanthema (calyx-flowered). A handsome variety, mainly differing from the type in the greatly enlarged and coloured calyx. See Fig. 199. (A. V. F. 33, 34; R. H. 1889, p. 548.)

C. mirabilis (remarkable). *fl.* pale lilac, large, seven to ten on the branches; corolla campanulate. August and September. *l.* coriaceous, irregularly crenulate-toothed; radical and lower ones elongated-ovate. Root napiform. Abchasia, 1895. A pretty alpine. (G. C. 1898, ii., p. 33, f. 10; R. H. 1895, p. 477.) SYN. *C. regina.*

C. olympica (Olympian). *fl.* pale blue, very shortly pedunculate, solitary or racemose; calyx segments spreading or reflexed; corolla obconical-funnel-shaped, cut into acute lobes. Summer. *l.*, radical ones obovate, petiolate, obtuse, with a few crenatures; middle ones linear, oblong, semi-amplexicaul; upper ones lanceolate, acute. Orient. Biennial.

C. pentagonia (five-angled). A synonym of *Specularia pentagonia.*

C. persicæfolia maxima (largest). A very large variety.

C. prenanthoides (Prenanthes-like). *fl.* blue, racemose; corolla twice the length of the slender calyx-lobes and almost five-parted. *l.* about ½in. long, ovate-oblong to lanceolate, sharply serrated; cauline ones mostly sessile. Stems 1ft. to 2ft. high. Rocky Mountains, 1873. SYN. *C. Roezli.*

C. regina (queen). A synonym of *C. mirabilis.*

C. Roezli (Roezl's). A synonym of *C. prenanthoides.*

C. saxifraga (stone-breaker). *fl.* violet, ¾in. to 1in. long; calyx segments oblong-lanceolate. *l.* linear or linear-lanceolate, narrowed to a petiole, entire or crenate from the middle; cauline ones linear, entire. Stems 3in. to 6in. high. Caucasus, 1875. SYN. *C. tridentata saxifraga* (of gardens).

C. serpyllifolia (Serpyllum-leaved). *fl.* blue, sessile; calyx tube ovoid, the lobes obtuse, ciliated. *l.* oblong-lanceolate, obtuse or retuse, ciliated; radical ones clustered, petiolate; cauline ones few, alternate, sessile. Stems tufted, diffuse, procumbent, one-flowered. Dalmatia, &c., 1889. SYN. *Edraianthus serpyllifolius.*

C. sibirica eximia (choice). *fl.* varying from pale bluish to violet, narrow-campanulate; stem much branched. *l.* long, scabrous. Europe, &c., 1883. Habit dwarf and compact.

C. strigosa (bristly). *fl.* purple, shortly pedunculate, variable in size; corolla glabrous. July and August. *l.* sessile, entire; lower ones oblong; upper ones oblong-lanceolate, acute. Stems erect, dichotomously and somewhat divaricately branched. *h.* 1ft. to 2ft. Syria, &c., 1819. Half-hardy annual. (B. M. 5068.)

C. stylosa (long-styled). A synonym of *Adenophora stylosa.*

C. Tenorei (Tenore's). A form of *C. versicolor.*

C. tridentata saxifraga (three-toothed stone-breaker). A garden synonym of *C. saxifraga.*

C. turbinata (top-shaped). A variety of *C. carpathica.*

C. versicolor Tenorei (Tenore's). A neat variety, not exceeding 1ft. in height.

C. Zoysii (Zoys').* *fl.* of a clear blue; corolla long-tubular, with five short, triangular lobes. *l.*, radical ones rosulate; cauline ones linnear: Austrian Alps, 1896. A charming alpine. (G. C. 1896, ii., p. 182, f. 32.)

CAMPANUMÆA. Some five or six species, natives of the Himalayas, Malaya, Southern China, and Japan, are included in this genus.

C. gracilis. This now forms a genus by itself. *See* **Leptocodon.**

C. lanceolata (lanceolate). A synonym of *Codonopsis lanceolata.*

CAMPELEPIS. A synonym of **Periploca** (which *see*).

CAMPELIA (from *kampe*, bending, and *helios*, the sun; the flowers bend round towards the sun). SYNS. *Gonatandra, Zanonia.* ORD. *Commelinaceæ.* A monotypic genus. The species, *C. Zanonia*, is a robust, stove perennial, broadly dispersed over tropical America; it has been introduced, but is probably lost to cultivation.

CAMPELIA (of Link). A synonym of **Deschampsia** (which *see*).

CAMPION. *See* **Silene.**

CAMPION, MOSS. *See* **Silene acaulis.**

CAMPOMANESIA (commemorative of Campomanes, a Spanish naturalist). ORD. *Myrtaceæ.* A large genus (nearly 100 species) of stove or greenhouse trees or shrubs, with the habit of *Psidium*, natives of tropical and subtropical America. *C. lineatifolia*, a Peruvian species, has been introduced, but is probably no longer in cultivation.

CAMPSIDIUM [not *Capsidium*]. This genus is included, by Bentham and Hooker, under **Tecoma** (which *see*), and the correct name of *C. chilense* is *T. valdiviana.*

CAMPTOCARPUS. A synonym of **Alkanna** (which *see*).

CAMPTOSEMA (from *kamptos*, curved, and *sema*, standard; in allusion to the curved appendage on both sides of the base of the standard). SYN. *Bionia.* ORD. *Leguminosæ.* A genus embracing ten species of sub-erect or twining, stove or greenhouse shrubs or under-shrubs, confined to South America. Flowers scarlet, showy, fasciculate-racemose towards the apex of the axillary peduncles; standard ovate or oblong; wings oblong; keel oblong, nearly straight. Leaves pinnately trifoliolate, rarely with only one or five to seven leaflets; stipules deciduous. The three species introduced thrive in a compost of sandy loam and leaf-soil, and may be increased by cuttings or by seeds.

C. pinnatum (pinnate). *fl.* 2in. long, in a short, stout raceme; petals of a pale but bright red-purple, straight, narrow, obtuse. July. *l.* 1ft. to 1½ft. long, alternate, shortly petiolate; leaflets three pairs and a terminal one, shortly petiolulate, drooping, 6in. to 7in. long, 2in. to 3in. broad, oblong or ovate-oblong, obtusely caudate-acuminate. *h.* 3ft. to 5ft. Brazil, 1838. Stove. (B. M. 7582.)

C. rubicundum (reddish). *fl.* deep ruby-red; standard partly reflexed, clawed; racemes compound, 8in. to 10in. long, drooping, many-flowered. *l.* distant, long-petiolate, trifoliolate; leaflets oblong or oblong-elliptic, glaucous beneath. Stem as thick as a finger. Southern Brazil. A very handsome climbing, stove shrub, of great length. (B. M. 4608.)

C. splendens (splendid). *fl.* produced in threes, on short and rough pedicels; calyx pale brown; corolla of a rich, bright crimson; racemes axillary, terminal. October. *l.* ternate; leaflets oblong-lanceolate, obtuse, smooth, dull green. Brazil (?). Greenhouse climber. SYN. *Kennedya splendens* (P. M. B. iii., p. 26).

CAMPYDORUM. A synonym of **Polygonatum** (which *see*).

CAMPYLANTHERA ELEGANS. A synonym of **Marianthus cœruleo-punctatus** (which *see*).

CAMPYLANTHUS (from *kampylos*, a curve, and *anthos*, a flower; in allusion to the incurved corolla-tube). ORD. *Scrophularineæ.* A small genus (four species) of greenhouse shrubs, natives of the Canary and Cape de Verde Islands, Arabia, and Scinde. Flowers racemose at the tips of the branches, often secund; calyx deeply five-cleft or five-parted; corolla-tube elongated, incurved, the limb of five spreading lobes. Leaves alternate, linear, somewhat fleshy, entire. *C. salsoloides* has been introduced, but is probably lost to cultivation.

CAMPYLOCENTRON SCHIEDEI. The correct name of **Todaroa micrantha** (which *see*).

CANALA. A synonym of **Spigelia** (which *see*).

CANARIA. *See* **Canarina.**

CANARIUM. SYN. *Colophonia.* This genus embraces about fifty species, mostly natives of tropical Asia; a few are indigenous in Africa and the Mascarene Islands, and one is found in Australia. To the species described on p. 259, Vol. I., the following should be added:

C. vitiense (Fijian). *fl.* yellowish-white, small, paniculate. *fr.* bluish-black. *l.* pinnate; leaflets five to seven, oblong-elliptic, obtuse. Fiji, 1887. A small tree.

C. zeylanicum (Cingalese). The correct name of *Balsamodendron zeylanicum.*

CANARY CREEPER. *See* **Tropæolum peregrinum.**

CANARY GRASS. *See* **Phalaris canariensis.**

CANAVALI. *See* **Canavalia.**

CANAVALIA. To the species described on p. 259, Vol. I., the following should be added:

C. Lunareti (Lunaret's). *fl.* of a beautiful rose-pink, large. Summer. *fr.* about 6in. long, strongly mucronate at apex. *l.* trifoliolate; leaflets glabrous, 5in. to 6in. long, 2½in. broad, ovate, narrowed to an acute apex. Japan, 1881. (R. H. 1881, f. 56-57.)

CANCERWORT. *See* **Veronica.**

CANDOLLEA (of Labillardière), in part. A synonym of **Stylidium** (which *see*).

CANDY CARROT. *See* **Athamanta Matthioli.**

CANE. A term applied to the stems of Reeds and the larger Grasses, to one-year-old stems of Grape Vines, and to the stems of Blackberries and Raspberries.

CANELLA. SYN. *Winterana.* There are only two species of this genus, one being a native of the West Indies and the other of Venezuela. Bracts three; sepals five; petals wanting; cymes in terminal, almost corymbose panicles.

CANISTRUM. This genus is included by J. G. Baker under **Æchmea** (which *see*), the plants described on p. 260, Vol. I., retaining their specific names.

CANKER is a little understood disease affecting Apple, Pear, and other trees, but chiefly Ash, Lime, Maple, and Hazel. The term in the past has been rather loosely applied, and the condition of the bark usually known as Canker has been ascribed to many causes. Even now there are numbers who will not admit that the disease is of fungus origin, but prefer to think that it is due entirely to errors in cultivation rather than to the ravages of the Wound Fungus, *Nectria ditissima*. That certain conditions of soil predispose trees to the attack of the fungus is doubtless correct; but the real trouble is due to the fungus above-named finding a lodgment in cracks of shrunken bark, in wounds caused by hail, frost, insect punctures, the careless use of the pruning-knife, etc.

Once the bark is attacked the wood soon becomes involved, and if preventive measures are not taken the trees may be killed outright. Amongst predisposing causes may be mentioned damp, cold, undrained soils. Again, certain varieties are more prone to Canker than are others, some of the best dessert Apples, like Blenheim Pippin, Cox's Orange Pippin, and Ribstone Pippin being amongst those most susceptible.

As stated above, the fungus, as a rule, enters through a wound in the bark, and it spreads rapidly to the parts adjoining the wood. It may manifest itself first in some of the smaller branches, when there is usually a dying away of the shoots in the vicinity; or it may be first seen on the trunk itself. There is considerable cracking of the bark (see Fig. 200, A); and if such cracks are carefully examined in spring there will be found groups of deep red dots. These are known as perithecia (Fig. 200, B), and they contain spore-bearing asci. In the autumn previous there was another form of fruit developed known as conidia, and borne upon white cushions. It is these spores which give rise to the disease once they find a suitable nidus.

A visit to the average country orchard will reveal numbers of these Cankered trees, old and unfruitful. Not only, too, may the branches be cracked in the way already suggested, but the main trunk may have its bark so distorted as to present the appearance shown at Fig. 201, in which the discoloured affected wood is disclosed.

Directly Canker is noted all diseased shoots should be cut away and burned. Portions of stems affected should

Canker—*continued.*

By permission of the Board of Agriculture.

FIG. 200. CANKER DUE TO NECTRIA DITISSIMA.

A, showing piece of Apple tree affected. B, Perithecia, showing orifices from which spores escape.

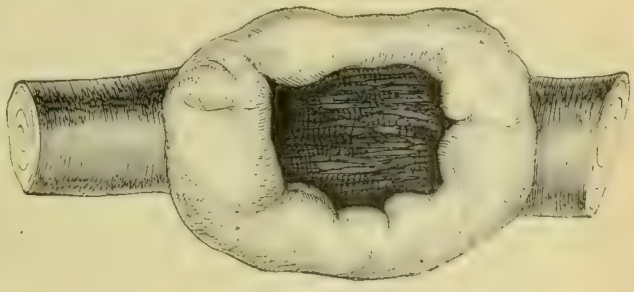


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FIG. 201. DISTORTED BARK DUE TO CANKER.

Canker—*continued.*

also be cut out and similarly treated, afterwards dressing the part with Stockholm tar. In the case of old and unfruitful trees badly attacked, these should be uprooted and burned.

In the United States there is a very destructive disease of Apples and Pears, sometimes spoken of as Canker. This is of bacterial origin, and has been referred to under Apple and Pear Blight (*Micrococcus amylovorus*). This attacks the main trunk as well as the smaller branches; even the blossoms are affected, and turn black. Roses are also affected by Canker due to a fungus.

CANKER WORM. A name applied by Americans to the caterpillars of certain destructive moths affecting Apple trees. One is a near relative of the March Moth (*Anisopteryx æscularia*), which gives trouble in this country, and should be similarly treated. The other is *Paleacrita vernata*. The former appears in autumn; the latter in spring.

CANNA. Nearly ninety specific names are kept up in the "Index Kewensis," but, according to Mr. J. G. Baker ("Gardeners' Chronicle," 1893), a large majority of these probably represent garden forms. "In this genus the short outer wrapper of the flower—the three small green leaves that remain on the top of the capsule—represents the calyx. The corolla is represented by the three longer equal leaves, of firmish texture and greenish colour, that form the next row. The showy part of the flower consists of the stamens, which are brightly coloured and put on the appearance of ordinary petals. These petaloid staminodia are unequal in size, and to the margin of one of the inner ones the one-celled anther is attached." All the species are natives of tropical or sub-tropical America.

The new race of Large-flowered Cannas, which the florist has evolved by skilful hybridising, marks an epoch in this flower. Alike in flowers and foliage, the new Cannas quite outstrip the old; they combine, in fact, the gorgeousness of the finest Gladioli with the beauty of the Dracæna. They may be used with telling effect in the borders in summer, on lawns, or in beds. Indoors they are quite as useful, and their season of beauty is a long one. They may be planted outside in late spring, affording them good rich soil and a sheltered position. They may be left out in the more favoured soils, and in the South and West of England, if covered with litter in severe weather; otherwise, they are best lifted and stored out of the reach of frost. For indoor work, they may be potted in either spring or autumn. Wherever grown, they like plenty of moisture in the growing season. They are propagated by seeds, or by dividing the crowns in spring into pieces containing from two to three growths.

To those described on p. 262, Vol. I., the following should be added:

C. esculenta (esculent). A synonym of *C. edulis*, from the rootstock of which is procured Canna Starch ("Tous les Mois").

C. grandiflora picta (large-flowered, painted). *fl.* yellow, spotted with red. 1885. A handsome and robust, garden variety. (R. H. 1885, p. 396.)

C. indica Bertini (Bertin's). *fl.* dark crimson, very large, borne in a spike-like panicle. *l.* narrow-ovate, of a beautiful pale green. *h.* 2ft. to 2½ft. 1889. A garden variety of the Indian Reed.

C. L. variegata (variegated). *l.* striped with yellow. Solomon Islands, 1897.

C. lanuginosa (woolly). The correct name of *C. Achiras*.

C. latifolia (broad-leaved). The correct name of *C. gigantea* (B. M. 2316).

C. liliiflora (Lily-flowered). *fl.* 4in. to 5in. long, Honeysuckle-scented, in a short, terminal raceme; perianth tubular, the three outer petaloid lobes linear-oblong, convolute, reflexed, tinged green, the three inner ones straight and extended, recurved at end, white, tinted yellowish-green. *l.* large, Musa-like, oblong, acuminate. Stems stout, erect. *h.* 6ft. to 10ft. A fine plant. (F. d. S. 1055-6; R. H. 1884, 132.)

C. lutea aurantiaca (orange-yellow). The correct name of *C. aurantiaca*.

Canna—*continued.*

C. patens limbata (spreading, bordered). The correct name of *C. limbata*.

C. Reevesii (Reeves'). A synonym of *C. flaccida*. (B. R. 2004.)

C. rosæflora (rose-flowered). *fl.* magenta-red. 1885. Garden variety. (R. H. 1885, p. 396.)

Varieties. Some of the best are as follow:

A. DE MONTEBELLO, flowers carmine, shaded with orange; leaves bright green and distinct; good for outdoor culture. AIGRETTE, flowers scarlet with a thin margin of gold, large; leaves deep green; 3ft. to 4ft. ALPHONSE BOUVIER, flowers dark crimson, of fine form, spikes large and freely produced; leaves bronzy-green, erect; 3ft.; one of the best for either indoor or outdoor culture. AMERICAN FLAG, flowers orange-scarlet with a well-marked gold band on the margin of each petal; large and of good form; best adapted to indoor culture. AMI JULES CHRETIEN, flowers chestnut-red, very large, and of great substance; leaves green and massive; 3ft. AMI PICHON, flowers rich scarlet, of fine globular form, and very free; leaves green; 3ft. to 4ft. AMIRAL AVELLAN: there are two distinct varieties known under this name, the one sent out by Vilmorin and Co. has bright yellow flowers spotted with red, and green leaves. The other, sent out by Crozy, has carmine-red flowers, with dark bronzy leaves. Both are handsome varieties. ANTOINE CHANTIN*, flowers very large, deep cerise salmon; leaves dark green; remarkably floriferous and dwarf; one of the best. ANTONIN CROZY, flowers rich crimson, large spikes; leaves dark green, marked with purple; 3ft. to 5ft. AURORE, flowers deep orange-red, very large and of good form; leaves deep green 3ft. to 4ft. AUSTRIA*, flowers canary-yellow, spotted with brown, very large, and of grand form; leaves green, long, handsome; 4ft. to 6ft. BEAUTÉ FOITEVINE, flowers bright red, large; leaves glaucous green; 3ft. CAPITAINE P. DE SUZZONI, flowers bright yellow, slightly spotted, large; leaves pale green; 3ft. to 5ft. COLIBRI*, flowers clear yellow, with deep carmine centre; leaves green; 3ft.; a distinct variety. COMTE DE BOUCHAUD*, flowers golden-yellow, heavily spotted with bright red; leaves deep green; 3ft.; a very handsome variety. COMTE DE GANAY, flowers a lovely salmon shade margined with yellow, large and fine; leaves deep green; 3ft. to 4ft. CRIMSON KING, flowers intense crimson, splendid spikes; leaves bronzy-green; 3ft. DUCHESS OF YORK*, flowers yellow, heavily spotted with red, large, good form, and free; leaves deep green; 3ft. DUKE OF YORK*, flowers vermilion-red, margined with yellow; leaves green; 4ft.; very free. FLORENCE VAUGHAN, flowers bright yellow, heavily spotted with scarlet; 3ft.; see Fig. 202. FREDERIC BENARY, flowers crimson-red; leaves green and long; 4ft. F. THOMAYER, flowers bright orange, very large and fine; leaves purple; 3ft. to 4ft. GEOFFREY SAINT-HILAIRE*, flowers

FIG. 202. CANNA FLORENCE VAUGHAN.

1 [illegible] (Trumpet).

2 Triandrus [illegible] (Angels' Tears).

3 Leedsii Duchess of Westminster.

4 Incomparabilis Princess Mary.

5 King of Spain (Trumpet).

Canna—*continued.*

deep orange; leaves dark bronze; 4ft.; free and very fine. GERMANIA, flowers deep crimson, margined with clear yellow; leaves bold and massive; 4ft. HENRY IRVING, flowers fine orange-scarlet, lower half of petal deep yellow; 3ft. ITALIA*, flowers scarlet and yellow, 5in. across, freely produced; leaves deep green; 5ft. to 7ft. JULES CHRETIEN*, flowers crimson, large; leaves dark green; 4ft.; a fine variety. KONIGEN CHARLOTTE*, flowers deep red, with a broad margin of gold; leaves dark green; 2ft. to 3ft.; a splendid variety for indoor culture. NIAD CROZY, flowers orange-vermilion, large, and fine; leaves green; 3ft. PAUL BRET*, flowers clear amber; leaves bronzy-purple; 2ft. to 3ft.; distinct and good. PAUL BRUANT, flowers orange-red, large, fine spikes; leaves green; 4ft. PRESIDENT

FIG. 203. CANNA PRESIDENT CARNOT.

CARNOT*, flowers red, large; leaves bronzy-green; 4ft.; see Fig. 203. QUASIMODO, flowers vermilion, margined with yellow; leaves green; 3ft. to 4ft. SENATEUR MILLAUD, flowers deep orange; leaves very dark; 4ft.; an effective variety. SIMON DELAUSE*, flowers golden-yellow, heavily spotted vermilion; leaves green; 4ft.; very fine. SOUVENIR D'ANTOINE CROZY*, a more vigorous and improved form of NIAD CROZY. SOUVENIR DE JEANNE CHARRETON, flowers bright orange-red, large; leaves dark green; 4ft. ULRICH BRUNNER*, flowers deep red, large, fine form; leaves green; 4ft. to 5ft.; a splendid variety.

CANNIBAL'S TOMATO. *See* **Solanum Anthropophagorum.**

CANSCORA. SYN. *Codamba.* This genus embraces about a dozen species, natives of tropical Africa, the East Indies, the Malayan Archipelago, and tropical Australia.

CANTHIUM. The following synonyms should be noted under this name:

C. chinense (Chinese). A synonym of *Randia dumetorum.*

C. coronatum (crowned). A synonym of *Randia dumetorum.*

CAPANEA. Included under **Campanea** (which *see*).

CAPE FIGWORT. *See* **Phygelius capensis.**

CAPE GUM-TREE. *See* **Widdringtonia juniperoides.**

CAPE HONEY FLOWER. *See* **Protea mellifera.**

CAPE PHILLYREA. *See* **Elæodendron capense.**

CAPE POISON BULB. *See* **Buphane disticha.**

CAPE PRIMROSE. *See* **Streptocarpus.**

CAPIA. A synonym of **Lapageria** (which *see*).

CAPNODIUM. *See* **Honeydew.**

CAPNODIUM QUERCINUM. *See* **Oak Fungi.**

CAPNORCHIS. A synonym of **Dicentra** (which *see*).

CAPOLLIN, CAPOULINOS. These names are applied to the fruits of *Cerasus Capuli* and *Prunus salicifolia.*

CAPPARIS HETEROCLITA. A synonym of **Mærua oblongifolia** (which *see*).

CAPRARIA RIGIDA. A synonym of **Freylinia undulata** (which *see*).

CAPREOLATE. Furnished with tendrils.

CAPRIFICATION. A supposed method of assisting in the production of figs by means of insect agency. *See* **Fig Insects.**

CAPROXYLON. A synonym of **Hedwigia** (which *see*).

CAPSICUM. Additional varieties are Golden Dawn, Ruby King, and Bell-shaped. In Gloucestershire, a very large variety, Bull's Nose, is grown; it is mild in flavour, and much esteemed by cooks.

Capsicums, although such hot subjects, are liable to insect pests of various kinds. To eradicate these, XL All Vaporiser will prove most effectual, without any detriment to the plant.

CAPULINOS. *See* **Capollin.**

CARABIDÆ. *See* **Beetles.**

CARAGANA. This genus embraces about fifteen species, natives of Asiatic Russia and the Himalayas. To those described on pp. 264-5, Vol. I., the following variety should be added:

C. arborescens pendula (pendulous). This only differs from the type in having the branches pendulous. 1887.

C. pendula (pendulous). A variety of *C. arborescens.*

CARAGUATA. *Massangea* and *Schlumbergia* are included here by J. G. Baker. The species number nearly two score, and are found in the West Indies, Guiana, and the Andes. Flowers clustered; sepals erect, imbricated, shortly connate at the base; corolla gamopetalous, the oblong segments shorter than the cylindrical tube; stamens inserted at the throat of the corolla-tube; filaments short; anthers free. Leaves and habit as in *Tillandsia* (from which this genus differs only in its gamopetalous corolla). To the species described on p. 265, Vol. I., the following should be added:

C. Andreana (André's). *fl.* about 2in. long, numerous; calyx and corolla bright yellow; panicle spike-like, rather lax, longer than the leaves; stem and bracts carmine-rose. March. *l.* arching, green, 2ft. long, 2in. broad, forming a lax rosette Andes of Pasto, 1884. (B. M. 7014; R. H. 1884, p. 247, f. 61 1886, p. 276.)

C. angustifolia (narrow-leaved). *fl.* large, few in a dense spike; calyx whitish, the segments oblong, acute; corolla yellow, the tube cylindrical, 2in. long; bracts red, large, oblong-lanceolate; peduncle short, with a few reduced leaves. *l.* in a dense rosette, 6in. long, lanceolate, channelled from the ovate base to the attenuated apex. Andes of Colombia, 1884. SYN. *Guzmania Bulliana.*

Caraguata—*continued.*

C. Belcana (Dr. Le Bèle's). *fl.* white, disposed in a compound, divaricate panicle; corolla about 2in. long; peduncle about 2ft. high. *l.* circinate, 2ft. to 2½ft. long, bright green, acuminate, dilated at base, lepidote on the under-surface. Origin unknown, 1891. (R. H. 1891, p. 114, f. 27.)

C. cardinalis (scarlet). A variety of *C. lingulata.*

C. conifera (cone-bearing). *fl.*, corolla pale yellow, above 2in. long, just overtopping the bright scarlet bracts; head dense, conical, 8in to 10in. long; peduncle erect. *l.* lanceolate, acute, bright green, 2ft. to 3ft. long, 2½in. to 3in. broad, forming a dense rosette. Ecuador, 1894. (B. M. 7359.)

C. Devansayana (Devansay's). The correct name of *Guzmania Devansayana.*

C. Fuerstenbergiana (Fuerstenberg's). *fl.*, corolla whitish, 1½in. long; spike simple, multifarious, 2in. to 3in. long, the bracts bright red. July. *l.* about fifteen in a rosette, lanceolate, 12in. to 16in. long. Andes of Ecuador, 1883.

C. Lindeni. The correct name of *Massangea Lindeni.* SYN. *Schlumbergeria Lindeni* (B. H. 1883, p. 121, tt. 10-12).

C. lingulata. The following are varieties of this species, with larger and more brightly-coloured outer bracts than the type: *C. splendens* (F. d. S. 1091), *C. cardinalis* (I. H. 1830, t. 674).

C. magnifica (magnificent). *fl.*, corolla yellow, ¼in. longer than the calyx; panicle 1½ft. to 2ft. long, many-branched; bracts reddish-yellow, 1½in. long. *l.* thirty in a rosette, pliable, lanceolate, above 1ft. long, 1½in. to 2in. broad, tinged with claret-brown. A garden hybrid between *C. Zahnii* and some robust *Tillandsia.*

C. magnifica (magnificent, of gardens). A synonym of *C. Osyana.*

C. Melinonis (M. Melinon's). *fl.*, corolla yellow, 1¼in. long; inflorescence a dense, simple, oblong spike, 3in. long; peduncle shorter than the leaves; bracts red. *l.* densely rosulate, 1ft. long, 1½in. to 2in. broad, lorate, tinged with brown beneath. French Guiana, 1879. SYN. *Guzmania Melinoki.*

C. Morreniana (Morren's). *fl.* yellow, in a large, compact head; bracts bright red; flower-stem 4in. to 6in. long *l.* rosulate, 16in. to 20in. long, 2in. broad, with recurved, acuminate tips; outer ones dark green, gradually passing, by being shaded and tinted with violet, into the violaceous floral ones. Rio Cuiaquer, Colombia, 1887. (R. H. 1887, p. 12.)

C. musaica (mosaic). (B. M. 6675; I. H. 1877, t. 268.) The correct name, according to Baker's classification, of the plant described by Morren under name of **Massangea musaica** (which *see*, on p. 335, Vol. II.).

C. Osyana (Baron Edouard Osy's). *fl.* axillary, solitary, shorter than the bracts; corolla yellow, twice as long as the calyx, clavate-tubular, sub-arcuate, the tube elongated, the lobes erect; bracts orange-salmon, imbricated, reflexed; spike compact, strobiliform. *l.* coriaceous, 1½ft. long, lanceolate, somewhat channelled. Stem erect, short, robust. Ecuador, 1885. (B. H. 1885, p. 254, tt. 16-17.) SYN. *C. magnifica* (of gardens).

C. Peacockii (Peacock's). *fl.* white, densely spicate; stem covered with bright purple bracts, the upper ones rolled round the flowers. *l.* 1ft. long, bronzy-purple above, rosy-purple beneath, forming an ample rosette. Probably Andine, 1835.

C. sanguinea (blood-coloured).* *fl.* clustered at the base of the centre of the rosette of leaves; corolla 2½in. to 3in. long, the tube yellowish-white, long, clavate, the three segments white, ovate. November. *l.* in a dense rosette, lanceolate, acute, falcate, thin, the lower part green, the upper half or two-thirds strongly tinged with bright red on both sides, the outer leaves 1ft. or more in length. Colombia, 1880. Plant stemless. (B. M. 6765; R. H. 1893, p. 468.)

C. Schlumbergerii (Schlumberger's). The correct name of *Schlumbergeria Morreniana.* SYN. *Massangea Morreniana* (of gardens).

C. serrata (saw-toothed). A garden synonym of *Karatas Scheremetiewii.*

C. splendens (splendid). A variety of *C. lingulata.*

C. straminea (straw-like). The correct name of *Schlumbergeria Morreniana.*

C. virescens (greenish). (B. H. 1879, p. 360, t. 19.) The correct name of *Schlumbergeria Roezlii, Pitcairnia virescens,* and *Puya virescens* (B. M. 4991)

CARALLIA. SYNS. *Diatoma, Petalotoma, Symmetria.* Seven species are included in this genus; but *C. lanceæfolia* and *C. lucida* are the only ones that have been introduced, and probably they are now lost to cultivation.

CARALLUMA. This genus includes about half-a-dozen species, natives of India and Arabia. To those described on p. 265, Vol. I., the following should be added:

C. campanulata (campanulate). *fl.* disposed in a terminal umbel; corolla reddish-brown, velvety, star-shaped, the limb 1in. across, flat. July. Branches ascending, four-angled, pale green, about

Caralluma—*continued.*

⅜in. in diameter. Ceylon, 1890. (B. M. 7274; G. C. 1892, xii., p. 369, f. 61.)

C. Luntii (Lunt's). *fl.* yellowish-green, spotted with purple, 1in. in diameter, five-lobed. Stems quadrangular, smooth, 8in. high, ¾in. thick, conspicuously toothed, marbled with purple. Southern Arabia, 1894.

CARANDAS. *See* **Carissa Carandas.**

CARAPICHEA. A synonym of **Cephaelis** (which *see*).

CARBENIA (compounded of the first syllables of *Carduus benedictus*, on which plant the genus was founded). SYN. *Cnicus* (of Gærtner). ORD. *Compositæ.* A monotypic genus. The species is a handsome, dwarf, hirsute or pubescent, annual herb, admirably adapted for the shrubbery, and thriving in any ordinary soil.

C. benedicta. Blessed Thistle. *fl.-heads* pale yellow, sessile, 1½in. high; involucral bracts in few ranks, abruptly tipped with an aristiform or spinescent and pectinately prickly appendage. *l.* blotched and marbled with silvery-white, sinuately pinnatifid or laciniate-toothed, the teeth or margins weakly prickly. South Europe and North-west America. SYNS. *Centaurea benedicta, Cnicus benedictus.*

CARBONATE OF LIME. Chalk, shell-sand, and marls are all forms of Carbonate of Lime. The marls also contain a certain proportion of potash and of phosphoric acid. These forms of Lime added to lands deficient in this substance have proved of great value: they are capable of neutralising the organic acids contained in sour soils, and form a valuable plant-food for many garden crops; they exert a decided beneficial mechanical influence upon stiff soils, besides consolidating light, sandy soils, liberating the potash, and forming the valuable double silicates. Marls are particularly useful in the cultivation of Roses.

CARDAMINE. *Dentaria* (see Vol. I., p. 458) and *Pteroneurum* (see Vol. III., p. 246) are included here by Bentham and Hooker. As many as sixty species, inhabiting the temperate and cold regions, are referred to this genus.

CARDAMOMUM. A synonym of **Elettaria** (which *see*).

CARDIOLOPHUS. A synonym of **Herpestis** (which *see*).

CARDIOSPERMUM (from *cardia*, the heart, and *sperma*, a seed; in allusion to the prominent, white, heart-shaped scars on the seed, which indicate its point of attachment). ORD. *Sapindaceæ.* A genus embracing upwards of a dozen species of climbing shrubs or herbs, natives of tropical and temperate regions. *C. Halicacabum* (Heartseed or Heart Pea) is largely used medicinally, and its leaves as a vegetable by the natives. The species have no horticultural value.

CARDOPATIUM (from *kardia*, a heart, and *pathos*, suffering; formally employed medicinally in cases of heart disease). SYN. *Brotera.* ORD. *Compositæ.* A small genus (two species) of half-hardy, perennial, Thistle-like herbs; one is a native of North-west Africa and the other is found in the Orient. Flower-heads blue, very numerous, subsessile, disposed in a dense, leafy, very spiny corymb; florets equal; involucre ovoid-oblong, with the bracts in many series; receptacle small, densely bristly; pappus paleæ numerous, in one or two series. Leaves alternate, once or twice pinnatisect, the lobes spiny. *C. corymbosum* is a useful plant for associating with tall subjects or for placing at the back of borders in ordinary soil, and only requires protection from frost. Propagated by division.

C. corymbosum (corymbose). *fl.-heads* ovate-conical; florets eight to ten. *l.*, radical ones oblong, pinnately parted; cauline ones narrower, gradually diminishing. Stems di- or trichotomously-branched, densely corymbose. *h.* 1ft. Greece, &c., 1871. (R. G. 692.) SYN. *Carthamus corymbosus* (S. F. G. 844).

CARDUNCELLUS. SYN. *Onobroma* (of Gærtner). About fourteen species, mostly natives of the Mediterranean region, are included in this genus. Leaves alternate, spiny-toothed or lobed.

CARDUUS. The proper name of *Cnicus benedictus* (mentioned under this heading on p. 266, Vol. I.) is **Carbenia benedicta** (which *see*).

CARELIA (of Adanson). A synonym of **Ageratum** (which *see*).

CAREX. Upwards of 800 species have been referred to this genus, but probably not more than 500 are entitled to rank as such; they are copiously dispersed over temperate and frigid regions, but few being found within the tropics, and those on mountains. To those described on p. 267, Vol. I., the following should be added:

C. arenaria (sand-loving). *fl.*, spikelets rather large, ovoid, all simple and sessile, usually crowded eight or ten together in a terminal spike of 1in. to 2in. Summer. Rootstock creeping, often many feet, emitting small tufts or single stems from a few inches to 1½ft. in height and leafy at base. Europe (Britain), in maritime sands.

C. brunnea (brown). *fl.*, inflorescence long, lax; peduncles often several from each sheath, the lowest exserted 1in. to 8in., slender, nodding, sometimes bearing three to ten spikes. *l.* two-thirds the length of the stem, ¼in. broad. Stems 1ft. to 3ft. high, slender. Himalayas, Australia, &c., 1892. Half-hardy. SYN. *C. gracilis* (R. H. 1892, p. 383). There is a form *variegata*, having leaves striped with white.

C. Drymeia (Drymeia). A synonym of *C. sylvatica*.

C. gracilis (slender). A synonym of *C. brunnea*.

C. japonica (Japanese). A garden name for *C. tristachya*.

C. maxima (greatest). A synonym of *C. pendula*.

C. paniculata (panicled). *fl.*, spikelets brown, numerous, crowded into a compound spike or panicle sometimes 4in. to 5in. long. Early summer. *l.* sometimes longer than the stems and ¼in. to ½in. broad. Stems 1ft. to 4ft. high, more or less triangular. Europe (Britain), &c. A stout species, forming large tufts.

C. scaposa (scapose). *fl.* brownish; spikelets ¼in. to ½in. long; cymes three or more to a scape, 1in. to 2in. broad; scapes longer or shorter than the leaves, stout, erect. Winter. *l.*, radical ones 1ft. long or more, 2in. broad, elliptic-lanceolate, acuminate at both ends; petioles sometimes 3in. to 4in. long. South China, 1883. Greenhouse. (B. M. 6940.)

C. secta (cut). *fl.*, spike lax, slender, drooping; spikelets pale brown. *l.* rigid, flat, keeled, much longer than the culms, ¼in. broad. Culms densely tufted, harsh, leafy, three-angled, 1ft. to 2ft. high, with scabrid edges. New Zealand, 1878.

C. tristachya (three-spiked). *fl.*, male spike solitary, linear, pedunculate; females twin, linear, approximating, slightly pedunculate. *l.* linear, striped with white. *h.* 1ft. Japan. Useful in pots for room decoration. SYN. *C. japonica* (of gardens).

C. Vilmorini (Vilmorin's). A graceful and very distinct species, with long and very narrow, densely-tufted leaves. New Zealand, 1897. It is easily increased by division of the tufts or by seeds. (R. H. 1897, p. 79, f. 26).

In addition to the above, *C. trifida* and *C. virgata* are in cultivation, but are at present rare.

CARICA. Including *Vasconcellea*. About a score species, natives of tropical America, form this genus. Flowers white, yellow, or greenish, unisexual and sometimes hermaphrodite; corolla of the male flowers salver-shaped, with an elongated tube; female flowers having five erect petals.

CARISSA. *Arduina* (described on p. 109, Vol. I.) is regarded by Bentham and Hooker as synonymous with this genus, which embraces about twenty species, natives of Africa, tropical Asia, and Australia.

C. Arduina (Arduina). The correct name of *Arduina bispinosa*.

CARLINA. *C. Chamæleon* is a synonym of *C. acaulis*.

CARLUDOVICA. This genus embraces about thirty species, natives of tropical America and the West Indies. To those described on p. 268, Vol. I., the following should be added:

C. Caput-Medusæ (Medusa's-head). *fl.* pale greenish-white, filamentose, forming dense heads. *l.* 3ft. to 4ft. long, cuneate-flabelliform, thickly plicate and bisected to the middle; segments three- to five-cleft, multifid towards the apex; ultimate segments recurved, acute. Habitat unknown, 1890. A handsome, stemless plant. (B. M. 7118.)

C. elegans (elegant). *l.* fan-like, 3ft. across, divided into four or five segments, which are again deeply cleft into narrow divisions. 1889. An ornamental, Palm-like plant.

Carludovica—*continued.*

C. Gardneri (Gardner's). *fl.* spirally disposed; spadix cylindrical; spathe four-leaved; peduncles axillary. *l.* obovate, narrowed to the petioles, bifid to the middle; lobes erect, oblong-ovate, acuminate. Brazil. (J. B. ii. 29, tt. 3-4.)

C. gracilis (slender). *fl.*, spadices pendulous, 4in. long, axillary, pedunculate, covered with twisted threads. *l.* alternate, 2ft. to 2½ft. long, bipartite, the divisions 2in. to 3in. broad, lanceolate, plicate, with ribs raised on the upper surface, bright green above, paler beneath. Caudex erect, waving. West Indies. SYNS. *C. Plumieri, Salmia palmifolia*.

C. latifolia (broad-leaved). *fl.*, spadix 2in. to 3in. long, scarcely rising above the spathe, with wavy stamens; scape short, thick, concealed by several spathe-leaves. *l.* springing from the top of the root, spreading, petiolate, 1½ft. to 2ft. long, rounded-flabelliform, strongly ribbed, bifid at apex, the lobes laciniate; petioles 4in. to 6in. long. West Indies, &c. SYN. *Ludovia latifolia* (B. M. 2950-1).

C. Laucheana (Lauche's). *l.* large, ensiform, plicate, green, coriaceous, bilobed at the apex, sheathing at base. Antioquia, 1893. Nearly allied to *C. plicata*. SYN. *Salmia Laucheana* (G. C. 1893, xiii., pp. 442, 481, f. 72).

C. microcephala (small-headed). *fl.*, spadix ¾in. long, covered with pale yellow flowers and long white filaments; spathes two, opposite, 1in. to 1½in. long. Spring. *l.* numerous at the top of the stem, 10in. to 18in. long, split to below the middle into two lanceolate, finely acuminate segments; petioles very slender. Stem 3½in. high, throwing out subterranean suckers. Costa Rica, 1880. (B. M. 7263.)

C. palmifolia (Palm-leaved). A provisional name for a plant introduced by B. S. Williams and Son.

C. plicata (folded). *fl.*, spadix 8in. long; rachis dense-flowered, much shorter than the petiole; spathes four, 4in. long. *l.* more or less deeply bifid, 3ft. to 4½ft. long; divisions ovate-lanceolate, acute or rounded at apex, argutely plicate towards the base. Caudex thick, woody, erect, 1ft. high, rarely taller, with a terminal tuft of many leaves. Brazil and Colombia.

C. Plumerii (Plumer's). *fl.*, spadices axillary, pedunculate, pendulous, cylindrical, 4in. long; bracts spathe-like, somewhat greyish. *l.* seven or eight at the apex of the stem, bifid to the middle, 2½ft. long, 8in. broad, plicate, rigid, very shiny, paler beneath; segments oblong, acute. Stem radicant. Martinique, &c.

C. Plumieri (Plumier's). A synonym of *C. gracilis*.

CARMICHÆLIA. New Zealand is the headquarters of the eighteen or so species embraced in this genus. To the one described on p. 269, Vol. I., the following should be added:

C. Enysii (Enys'). This species forms hard, compact patches 1ft. to 4ft. in diameter, and scarcely rising 1in. above the surface of the ground; in fact so dense are the branches that it is impossible to thrust the finger between them. New Zealand, 1877.

C. Mulleriana (Muller's). *fl.* whitish, striated purple, small, solitary or in pairs in the axils of the leaves. *l.*, leaflets one to three, small, obovate, emarginate, about ¼in. long, on a rather longer petiole. Branches slender, compressed, pinnately branched; branchlets filiform, compressed. *h.* about 2ft. 1887.

CARNATION. This lovely flower, which within the past decade has been considerably improved by the florists, bids fair to regain the popularity it enjoyed with the old-time gardeners. Colour, constitution, and form all show a considerable advance upon those varieties that were in existence even fifteen years or less ago. The flower is one of the oldest of which we have records, and Mr. Douglas informs us that even the much-prized yellow Carnation was grown in London towards the close of the sixteenth century. Popular as it is with a very large number of gardeners, it would be even more extensively grown were its merits as a town plant more widely known, as well as its comparatively easy cultivation. Perhaps the most important improvement is manifest in what are known as Border varieties, lists of which will be found under the headings of "Selfs" and "Fancies." In the Malmaison section, too, there has been a steady advance, especially as regards colour, though it must be confessed that this section seems more than ordinarily susceptible to fungoid diseases. For the benefit of the amateur we may say that the Selfs are of one colour only, whereas the Fancies comprise those varieties which, on account of their colours, do not fall within any of the other classes enumerated in Vol I.; for instance, those with a yellow or a white ground, or those mottled, flaked, or spotted with various colours.

Carnation—*continued.*

Culture. Some considerable space is devoted in Vol. I. to cultural details. There are, however, one or two points which may with advantage be touched upon here. First, in relation to propagation by seed, which is the method employed for raising new varieties. By far the best results are obtainable by careful hybridisation. Care must, however, be taken not to mix the classes. Selfs should be cross-fertilised with Selfs, Fancies with Fancies, &c.

Border Carnations are best planted from September to November in specially prepared quarters as advised in Vol. I. They may either be arranged in beds or in borders. They are generally propagated by layers in autumn, a form of increase already explained, but very plainly

FIG. 204. LAYERED CARNATION SHOOT.

shown in the illustration (Fig. 204). Those, however, who exhibit, grow the plants in pots. This is what Mr. Douglas, the Carnation specialist, says upon the subject in the "Book of Gardening":

The layers are inserted when ready in what the trade term "sixties," two plants in a pot, and they are wintered in garden-frames. They are placed fairly close to the glass, in order that they may have the full benefit of light and air. In some districts damp is troublesome, doing some damage to the leaves by what is termed "spot," but free ventilation will usually prevent its appearance. The work during winter consists in keeping the plants clean by removing dead and decaying leaves, stirring the soil on the surface, and by paying careful attention to the watering. In March they must be transferred to their flowering-pots. Two plants should be placed in a pot 8in. in diameter, or three in one 9in. The pots must be drained well, and the compost packed in firmly around the plants. In the process of transferring the plants from the small to the large pots, care must be taken not to disturb the roots more than is absolutely necessary. As the plants are repotted, they should be placed again into garden-frames until they are established, when the best way to treat them is to stand them out in the open air on a hard bottom of ashes. When the weather is mild, and the potting is not done until after the middle of March, it may be as well to stand them out-of-doors at once, as in the spring the frames are often required for half-hardy and tender plants. The flower-sticks ought to be placed to the plants very soon after they go out-of-doors, as high winds may snap off valuable plants close to the surface of the ground.

Careful attention must be given to watering all through the season, and as soon as the flower-buds show colour, the plants must be removed to the greenhouse, where they are to flower. Green-fly and thrips between them will

Carnation—*continued.*

disfigure both leaves and flowers if not dealt with at the outset. Fumigation must therefore be resorted to. To prevent the "grass" from drawing up weakly, air must be freely given, and when the flowers open they must be shaded from bright sunshine to preserve their beauty as long as possible. About the end of July layering may be commenced, and it will be better to place the plants out-of-doors, as the layers become drawn if the plants are kept under glass. Those plants growing in the open borders should be layered, of course, where they are. To do this scratch some of the ordinary garden-mould away from the base of the plants, replacing it with the compost already recommended.

Tree Carnations require rather different treatment. As the growths are mostly found up the main stems, they cannot very readily be layered, and are propagated by slips from the main stems of the plants. These strike freely in hot-beds, or early in the season in a forcing-house with a little bottom-heat. The temperature of the house should be about 55deg. If possible, the bottom-heat should be kept about 80deg. to 90deg. The slips will readily form roots in sixty-sized pots; when the young plants are established, they should be potted singly, and gradually inured to greenhouse culture. From May until the end of September Tree Carnations do best out-of-doors. The best potting soil for Carnations is three parts of good loam, one part of decayed manure, and one part of leaf-mould; sand to be added to lighten heavy soils. Mortar rubbish, broken up and run through a ½in. sieve, is also excellent to mix with the compost.

Malmaisons are also subjects for greenhouse treatment, except in summer. They require a minimum night temperature in winter of 55deg., rising in the daytime to a maximum of 65deg. They may be propagated similarly to the Tree Carnations. Great care with the watering must be observed in winter, as errors in this respect predispose the plants to fungoid attacks.

Besides the pests enumerated in Vol. I., and such diseases as Fairy Ring Spot, Rust, and Carnation Maggot, dealt with under special headings in the present volume, there are some few others which call for remark here. First as to Earwigs. These destroy the petals or so disfigure entire flowers, that they are useless. They are best trapped according to the methods detailed under **Earwigs**. Thrips attack the flower-buds, and in the open they should be syringed with weak Kerosene Emulsion; while under glass they are best destroyed by fumigation.

One of the most insidious pests which of late years have been discovered is a species of Eelworm (*Tylenchus*); this feeds in the stem, causing it to swell, burst, and eventually to die. Frequently these pests are introduced with potting soils; therefore, the greatest care must be observed. These Nematoid worms are very plentiful on grass lands, and where the soil has been obtained from such a source it would be prudent to first bake it. Those who keep large quantities of potting material stock it at least six months before using. The Eelworms are exceedingly minute, and thus readily escape observation. They show a marked partiality for the leaves of old plants. Where plants are badly infested they should be burnt, and the soil baked.

Cats and rabbits have a weakness for Carnation "grass" at all seasons; while in spring the sparrows play havoc with it, especially when the weather is severe. The best protection is afforded by pieces of narrow-meshed netting stretched over sticks bent semi-circular fashion and well pegged down at the sides. Black cotton stretched diagonally across the plants will, at any rate for a time, act as a deterrent against sparrows.

Under glass Red Spider is occasionally troublesome in dry weather. It may, however, like Green-fly and thrips, be ousted by fumigating.

Carnation—*continued.*

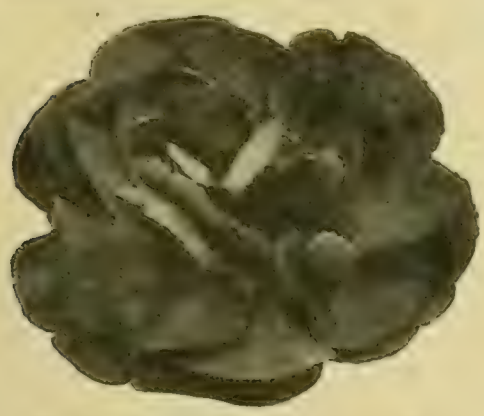


FIG. 205. SELF CARNATION MRS. JAMES DOUGLAS.

Varieties. The following in their respective classes may be recommended:

Crimson Bizarres. — BRUCE FINDLAY, EDWARD ROWAN, GEORGE RUDD, J. D. HEXTALL, J. S. HEDDERLEY, JOHN HARLAND, MASTER FRED, PATRIOT, PHŒBE, THADDEUS, VIRGIL, and W. WARDLE.

Pink and Purple Bizarres.—AUTOCRAT, HARMONY, MELODY, NIOBE, SQUIRE PENSON, and WILLIAM SKIRVING.

Scarlet Bizarres.—BIRETTA, DR. HOGG, DUKE OF YORK, JOSEPH CROSSLAND, OTHELLO, ROBERT HOULGRAVE, ROBERT LORD, and ROBERT MONK.

FIG. 206. FANCY CARNATION CZARINA.

Carnation—*continued.*

Purple Flakes.—AGRICOLA, BERNARD, CHARLES HENWOOD, FLORENCE NIGHTINGALE, MAGPIE, MRS. DOUGLAS, and SQUIRE WHITBOURN.

Rose Flakes.—JOHN KEET, LADY MARY CURRIE, MRS. ROWAN, ROSAMUNDI, ROSE OF STAPLEFORD, SYBIL, THALIA, TIM BOBBIN, and WILLIAM OF WYKEHAM.

Scarlet Flakes. — ALISEMOND. CANNELL JUNIOR, CERES, FRED PHILLIPS, GUARDSMAN, MATADOR, MISS CONSTANCE GRAHAME, and ROBERT CANNELL.

Fancies.—BRODRICK, yellow ground; CARDINAL WOLSEY, yellow ground; CZARINA (Fig. 206), yellow, with scarlet markings; DON JUAN, buff, flaked purple; GEORGE CRUICKSHANK, orange-buff, flaked crimson; MISS MACKENZIE, buff, flaked rose; MOGUL, yellow, with red markings; PELEGIA, deep pink, flaked light heliotrope; PERSEUS, yellow ground, edged orange-red; THE CZAR, yellow ground, with purple margin; and ZANZIBAR, yellow ground, spotted with scarlet.

Malmaisons.—LADY GRIMSTON, pinkish-white; LORD ROSEBERY, deep rose, very fragrant; MRS. MARTIN-SMITH, rose-pink; NELL GWYNNE, pure white; PRIME MINISTER, bright scarlet; TRUMPETER, rich scarlet.

Selfs.—AMY ROBSART, rich scarlet; BENDIGO, bluish-purple; BOADICEA, rosy-scarlet, excellent for the border; BRITANNIA, deep yellow; CINNAMON; COLUMBUS, lavender; DICK DONOVAN, blush-white; ENDYMION, salmon-pink; GARVILLE GEM, heliotrope; GERMANIA, deep yellow; HER GRACE, blush-pink, changing to pure white; ISINGLASS, deep scarlet; MRS. COLBY SHARPIN, cinnamon, excellent for the border; MRS. JAMES DOUGLAS, rich carmine rose, of fine form (see Fig. 205); NOX, crimson-maroon; SILVER STRAND, white; and WATER WITCH, blush-white.

Tree or Perpetual.—COMUS, white, vigorous; JULIAN, rich scarlet; PATROCLES, scarlet, free; PRIMROSE DAY, yellow; REGALIA, rose-pink; SARDIS, clear pink; SYLVANUS, purple; URIAH PIKE, dark crimson; WILLIAM ROBINSON, rich scarlet; WINTER CHEER, bright scarlet.

CARNATION FAIRY RING SPOT (*Heterosporium echinulatum*). This disease is due to a well-characterised fungus, whose clusters of fruit are borne in rings on light-coloured spots on the upper and under surfaces of the leaves as well as upon the leaf-stalks. The disease is a most destructive one under glass. Predisposing causes are great fluctuations of temperature, watering overhead, and lack of air. When once plants are badly attacked, there is little chance of cure, and they had better be pulled up and burned. In the case of light attacks, all the diseased leaves should be removed, the plants isolated, and the remainder sprayed with potassium sulphide (½oz. to 1gall. of water). If this is not done, the disease will be certain to appear the following season, as it is tided over the winter by means of sclerotia; these in spring yield conidia, which, on coming in contact with Pink or Carnation foliage, begin again the cycle.

CARNATION MAGGOT (*Hylemia nigrescens*). This is a formidable pest of the Carnation cultivator. The insect responsible for the mischief belongs to the order *Diptera*, and is the grub of a small black fly somewhat resembling the common house-fly in appearance. This insect deposits its eggs upon the leaves of Carnations, usually selecting seedlings or prepared cuttings and layers. Less often older plants are attacked. From the eggs hatch out yellowish-white grubs, which feed upon the pith, leaving little more than a skin covering. If infested Carnations are constantly examined, there will be found some whitish streaks. The only thing then to be done is to dislodge the pests by opening the foliage with a pin or a needle, and burning the dead and decaying portions. The plants may also be sprayed about the time the insects are on the wing with some distasteful insecticide—a solution of soluble petroleum (a wineglassful to 1gall. of warm water), or even with weak Kerosene Emulsion.

CARNATION RUST (*Puccinia arenariæ*). This fungus attacks both Pinks and Carnations, as described in Vol. III., p. 248, under **Puccinia.** It is also common on many wayside plants belonging to the same Natural Order. A weak solution of Condy's Fluid will probably prevent it from spreading.

CARNEOUS. Flesh-coloured.

FIG. 207. DIONÆA MUSCIPULA.

CARNIVOROUS PLANTS. This term is usually applied to genera like *Drosera*, *Pinguicula*, *Nepenthes*, *Dionæa*, and *Utricularia*, which are thought by some to possess the power of absorbing nitrogenous substances through their leaves, and digesting them within their tissues. Several of the best known are British plants—

FIG. 208. DROSERA ROTUNDIFOLIA (natural size).

Carnivorous Plants—*continued.*

Drosera rotundifolia and *D. intermedia* for instance. The most interesting of all, however, is *Dionæa muscipula* (Fig. 207), or Venus' Fly-trap.

Others regard these plants as insect-catching rather than insect-eating, their contention being that the plants have no power to cast away the captured prey, which gradually decays upon the leaf. In fact, it has been observed that when the creature trapped proves to be a rather large insect, or perhaps a spider, the decomposition that follows after death frequently causes the destruction of the leaf.

As *Drosera rotundifolia* will serve as well as any to illustrate the functions of these interesting plants, it has been selected here (Fig. 208). The leaf is the interesting part of the plant. It bears on its upper surface a large number of filaments, or tentacles, as they are usually called. Some large leaves have as many as 250, but usually there are not more than 100. Those in the marginal row, which are often ¼in. in length, spread out in the plane of the surface of the leaf; the members of the next row are shorter and rather more erect, and so on, till those in the central part of the leaf are very short and quite erect (see Fig. 209). There are a very few long tentacles on the upper part of the leaf-stalk. At the extremity of each tentacle is a gland surrounded by a globule of a clear fluid of the consistency of gum. It is not certain whether the tentacles are hairs modified to perform a special duty, or prolongations of the leaf itself; but at any rate the framework of the leaf enters into them, as will be seen in the much-magnified drawing of one of the glands (see Fig. 210). The central spiral threads are in connection with the fibro-vascular system of the leaf; outside of them are two or three layers of simple cells containing a purplish fluid, which undergoes a change when the gland is irritated. The pale green leaf, with its crimson tentacles, surmounted with glistening drops of liquid, looks very beautiful in the sunshine, and well earns for the plant the common name of Sundew. The plant is at its best in July and August, and flowers in the latter month.

FIG. 209. LEAF OF DROSERA ROTUNDIFOLIA (magnified two diameters).

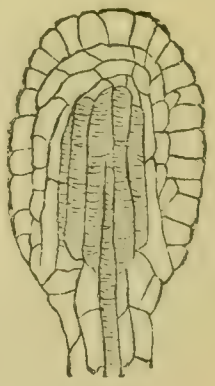


FIG. 210. GLAND OF DROSERA ROTUNDIFOLIA (much magnified).

Suppose a tiny fly to alight upon the central part of a leaf, it will be held there by the sticky substance surrounding the glands on the tentacles. The glands at once begin secreting a watery fluid closely resembling pepsin in its properties, and which, like it, dissolves organic food. At the same time an impulse travels along the fibro-vascular system to the outer tentacles. These in the course of an hour gradually turn over, the nearer ones first and the remoter ones later, on to the insect, and there pour out the same fluid. When, after a few days,

Carnivorous Plants—*continued.*

the nutritive substances have been dissolved out, the tentacles regain their original position. Should the fly be caught on one side of the leaf, usually the tentacles of that side only are inflected. Often the edge of the leaf bends over as well as the tentacles. The marginal tentacles turn inwards and carry the fly, or what not, to the centre of the leaf, there to be acted on, if it should be caught on them alone. Darwin says that on examining a dozen plants, having fifty-six fully-expanded leaves, he found thirty-one with dead insects or their remains, and on one large leaf the remains of thirteen distinct insects. He mentions the case of a butterfly — the Small Heath (*Cœnonympha pamphilus*) — being caught, and we have on two occasions found a specimen of the small Blue Dragon-fly firmly held, though by no more than one leaf.

If the substance deposited on the leaf contains a good supply of nitrogen compounds easily dissolved, such as raw meat, hard-boiled eggs, or fragments of insects, the movement of the tentacles is very rapid. Darwin mentions an instance in which a piece of raw meat placed on a gland caused inflection in five or six minutes, whereas a piece of cinder only caused movement in about four hours. Tickling or repeated touching will in time cause the tentacles to inflect, but a tap will not; so that the wind blowing blades of grass against the plant does not cause unnecessary action and a waste of energy. The centre of irritability seems to be in the gland, for if this is cut off the tentacles will not inflect, whereas almost the tiniest particle of nitrogenous matter deposited on the gland will cause motion, testifying to its great sensitiveness. As a result of stimulation the purple particles in the cells of the glands aggregate into variously-shaped masses, which float about in a now colourless fluid.

In the case of *Dionæa muscipula* the sensitive bristles are situate in the centre of each lobe of the leaf. When these are touched, the outer edges close up, thus preventing the escape of the fly or other intruder.

CARNIVOROUS SLUGS (*Testacella*). Some points in connection with these useful Slugs are dealt with in Vol. IV., under **Testacella.** There, however, but

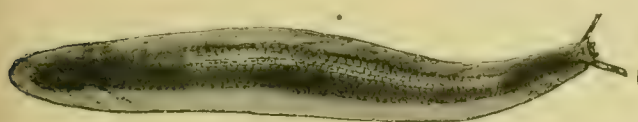


FIG. 211. CARNIVOROUS SLUG (*Testacella haliotidea*).

two species are mentioned—*T. haliotidea* (Fig. 211) and *T. Maugei*. There is a third, *T. scutellum*. The first-named species is fairly abundant in certain districts—Oxfordshire, for instance—though the Slugs are seldom recognised as beneficial to the gardener, and are often destroyed. They are, however, chiefly confined to the South-west portion of England. A popular but erroneous impression is that these Slugs do not come out of the soil; but they have been frequently found upon lawns when searching for worms with a light, and upon gravel walks. Nor do they confine their attention entirely to worms; they will not hesitate to attack Slugs of other species. Their method of attack on worms is to seize their unfortunate prey some distance up, inflict a wound—probably by means of the toothed lingual ribbon—and draw it in thus doubled up. The worms are not swallowed alive. *T. scutellum* differs chiefly from *T. haliotidea* in being of a more pronounced yellow, while the lines on the back meet in front of the shell instead of merging under its edge. *T. Maugei* has a much larger shell than the other two species.

CARPENTERIA. In the Southern counties of England this very fine shrub is quite hardy, but North of London it requires the protection of a wall, or even of a cool greenhouse. It is by no means exacting in its cultural requirements so long as the soil is fairly rich, moist, and well drained. It is a rather difficult plant to strike from cuttings, but it may be readily propagated by layering. The layers should be tongued, and a little damp moss and sand pressed into and over the incision, the whole being kept moist by frequent syringings.

CARPINUS. Of this genus there are nine species, broadly dispersed over North temperate regions. To those described on p. 272, Vol. I., the following should be added:

C. caroliniana (Carolina). A synonym of *C. americana.*

C. japonica (Japanese). *fl.*, male catkins cylindric, with spreading, ovate bracts; females large, ellipsoid, with large, toothed, imbricated bracts. *l.* lanceolate-ovate, long-pointed, doubly serrated, 2in. to 4in. long, ¾in. to 1½in. broad; petioles ¼in. to ½in. long, and, as well as the branchlets and peduncles, rusty-tomentose. Japan, 1889. A dwarf tree.

C. Ostrya (Ostrya). A synonym of *Ostrya virginica.*

CARPOCAPSA. This is a genus of very small Moths, one species of which is exceedingly destructive to Apple trees—*C. pomonella*, or Codlin Moth. Occasionally, too, the larvæ of another species (*C. splendidana*) are found in Walnuts, though more usually in Acorns.

CARPODETES RECURVATA. A synonym of **Stenomesson recurvatum** (which *see*).

CARPOLYZA. SYN. *Hessea.* This genus is monotypic. Leaves two to four, contemporary with the flowers.

CARPOPOGON. A synonym of **Mucuna** (which *see*).

CARREGNOA. A synonym of **Tapeinanthus** (which *see*).

CARRIERIA (named in honour of E. A. Carrière, Editor-in-chief of the "Revue Horticole"). ORD. *Bixineæ.* A monotypic genus. The species is a hardy tree with the general aspect of *Idesia polycarpa*, but with a woody, capsular fruit. It probably requires similar culture to **Idesia** (which *see*).

C. calycina (having a prominent calyx). *fl.* few, in a simple, terminal raceme; sepals five, white, rounded, connivent, very pilose. *fr.*, an elongated capsule, dehiscing in three valves *l.* alternate, caducous, petiolate, ovate, toothed, coriaceous, glabrous. Se-Tchuen, 1896. (R. H. 1896, p. 47, f. 170.)

CARRION FLOWER. *See* **Stapelia.**

CARROT. In addition to the varieties recommended in Vol. I. for forcing, the following are noteworthy: Early Scarlet Horn, Little Gem, and Scarlet Perfect.

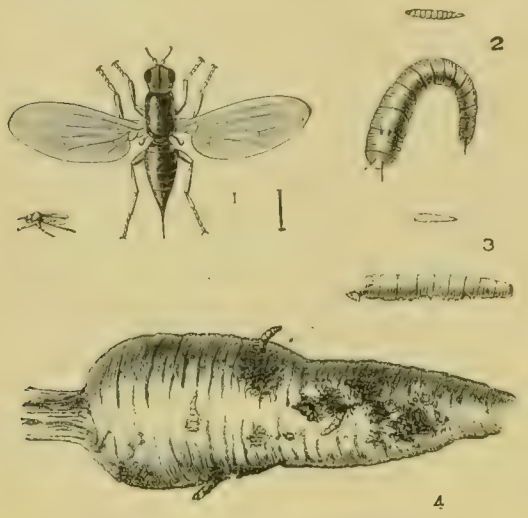
CARROT GRUBS (*Psila rosæ*). These pests are most abundant in this country, as well as in many parts of the Continent, but especially in Germany. The life-history and depredations of the insect responsible for the mischief were somewhat fully dealt with in Vol. I. Little, therefore, remains to be added here. The perfect insect, a fly (Fig. 212, 1), is on the wing in May, when the female, which has a more pointed body than the male, furnished with an ovipositor, lays the eggs in the soil in the vicinity of the roots, the insect actually working beneath the surface for the purpose. The larvæ (Fig. 212, 2), when hatched out, make for the food ready to hand, and if Carrots showing signs of withered tops are lifted, they will be found covered with rusty spots (Fig. 212, 4), somewhat similar to those arising from iron-mould. The pupa-state (Fig. 212, 3) is passed beneath the soil, or it may be in the stored Carrots. There are several broods in the season, and the repeated attacks of the pests cause the Carrots to become rotten in bad cases, and always to lessen their market value.

Wood-ashes are very distasteful to the grubs of the Carrot Fly, and should be always employed. Some cultivators also add paraffin at the rate of 1qt. to a barrow-load of the wood-ashes, and apply this on the

Carrot Grubs—*continued.*

surface when the young plants are about 4in. high. Watering with a solution of soluble petroleum (1oz. to the gallon of water) is also effectual if done when the fly is on the wing. The soil should also be made firm so that the female is unable to go beneath the surface for egg-deposition.

Wireworms are also very destructive to Carrots, and are most difficult to deal with, especially in small gardens which



By Permission of the Board of Agriculture.

FIG. 212. CARROT FLY *(Psila rosæ).*

Showing 1, perfect Insect, natural size and magnified; 2, Larva, natural size and magnified; 3, Pupa, natural size and magnified; 4, infested Carrot with rusty spots.

have to be kept continually cropped. Wood-ashes in this case, too, have been found of exceeding benefit. They should be well dug in when the soil is prepared, and also plentifully employed in the drills when the seed is sown. Gas-lime, where it can be employed early in winter, and the quarters allowed to remain uncropped, is also excellent for Wireworms.

CARROT, ROCK. *See* **Thapsia edulis.**

CARROT, TREE. *See* **Thapsia edulis.**

CARTESIA. A synonym of **Stokesia** (which *see*).

CARTHAMUS CORYMBOSUS. A synonym of **Cardopatium corymbosum** (which *see*).

CARTHAMUS. This genus embraces about twenty species, natives of the Mediterranean region, Central Europe, and Central Asia, and includes **Kentrophyllum** (which *see*).

C. mitissimus (least spiny). A synonym of *Carduncellus mitissimus.*

CARTONEMA (from *kartos*, shorn, and *nema*, a filament; in allusion to the shape of the filaments supporting the pollen-bags). ORD. *Commelinaceæ.* A genus including five or six species of greenhouse herbs with leafy stems, simple or branched at the base, all natives of Australia. Flowers disposed in simple, terminal spikes or racemes, solitary within small or narrow bracts. *C. spicatum* has been introduced, but is probably not now in cultivation.

CARUM. Including *Petroselinum* and *Zizia.* The genus embraces about fifty species, mostly found in temperate regions.

CARUMBIUM (of Kurz). A synonym of **Sapium** (which *see*).

CARUMBIUM (of Reinwardt). A synonym of **Homalanthus** (which *see*).

CARUNCULARIA. Included under **Stapelia** (which *see*), the correct name of *C. pedunculata* being *S. lævis.*

CARVI. *See* **Carum Carvi.**

CARYA. SYN. *Hicorias.* Eleven species are referred to this genus by Bentham and Hooker. To those described on p. 274, Vol. I., the following should be added:

C. sulcata (furrowed). *fl.*, catkins very long, pedunculate, glabrous. March and April. *fr.* ovate, 2½in. long, pericarp very thick; nut elongated at both ends, conspicuously pointed, quadrangular. *l.*, leaflets seven to nine, obovate-oblong, acuminate, serrated, glabrous above, tomentose beneath. A large tree, with scaly bark; it resembles *C. alba.* SYN. *Juglans sulcata.*

CARYOCAR. Including *Pekea.* About eight species, natives of tropical America, are included in this genus. Flowers disposed in terminal racemes; calyx deeply five- or six-cleft; petals five or six, imbricated; stamens numerous. Fruit sub-drupaceous. Leaves opposite, digitately three- to five-foliolate; leaflets coriaceous. *C. nuciferum* is known as the Saouari, Souari, Suwarrow, or Butter Nut.

CARYOPSIS. *See* **Cariopsis.**

CARYOPTERIS. SYNS. *Barbula, Mastacanthus.* This genus includes five species of erect or rambling shrubs, natives of Northern and Eastern Asia and the Himalayas. Calyx deeply five-cleft; corolla tube short, the middle lobe of the lower lip larger, crisped or fimbriate; stamens four. Leaves opposite, acuminate, minutely gland-dotted.

CARYOTA. About a dozen species are included here; they inhabit tropical Asia, the Malayan Archipelago, New Guinea, and tropical Australia. To those described on pp. 274-5, Vol. I., the following should be added:

C. Alberti (Albert's). A synonym of *C. Rumphiana.*

C. furfuracea (scurfy). The correct name of *C. purpuracea.* The plant is identical with *C. mitis.*

C. obtusa (obtuse). This only differs from *C. urens* in the shorter, unexpanded male flowers, slightly in the fruit, and in the more rounded and crenate tips of the leaflets. Upper Assam.

C. o. æquatorialis (Equatorial). *fl.*, males larger than in the type; stamens more than 100. *l.* having pinnules more acute and more deeply crenate or serrated. Malay Peninsula. According to Sir J. D. Hooker, *C. ochlandra* is probably identical with this.

C. ochlandra (yellow-stamened). Probably synonymous with *C. obtusa æquatorialis.*

C. plumosa (feathery). A species supposed to be newly introduced, and distributed by a Belgian firm without description or information as to origin.

C. Blancoi, C. elegans, C. majestica, and *C. speciosa* are in cultivation at Kew, but are very scarce.

CARYOTAXUS. A synonym of **Torreya** (which *see*).

CASCARILLA GRANDIFOLIA. A synonym of **Cosmibuena obtusifolia latifolia** (which *see*).

CASEARIA includes *Iroucana.*

CASSAVA WOOD. *See* **Turpinia occidentalis.**

CASSEBEERA. All the species require stove treatment, and the soil which suits them best is peat of a sandy nature, allowing a free passage to the water, which should be liberally administered to the roots.

C. triphylla. The characteristic of this Fern responsible for the specific name is well shown in Fig. 213.

CASSELIA (a commemorative name). ORD. *Verbenaceæ*. A small genus (five or six species) of dwarf, stove herbs, under-shrubs, or shrubs, confined to Brazil. Flowers few, in axillary racemes; corolla limb sub-bilabiate. Leaves opposite, membranous, deeply-toothed or rarely entire. *C. integrifolia* (F. d. S. 361; P. M. B. xv. 75) has been introduced, but is probably no longer in cultivation.

CASSELIA (of Dumortier). A synonym of **Mertensia** (which *see*).

CASSIA. Including *Chamæfistula*. The species of this genus are broadly distributed over the warm regions of the globe. To those described on p. 276, Vol. I., the following should be added:

C. australis (Southern). *fl.* yellow, two to six in a loose umbel, on peduncles usually shorter than the leaves; petals ½in. long. *l.*, leaflets usually eight to ten pairs, oblong, lanceolate, or almost linear, ¼in. to 1in. long, the margins recurved or revolute. *h.* 3ft. Australia (re-introduced), 1890. An erect, greenhouse shrub. (B.M. 2676.) SYN. *C. Barrenfieldii*.

C. Barrenfieldii (Barrenfield's). A synonym of *C. australis*.

C. bicapsularis (two-capsuled). *fl.* bright yellow, medium-sized; racemes copious, corymbose, as long as the leaves. *l.* distinctly petiolate; leaflets six to eight, membranous, ½in. to ¾in. long. Branches virgate. Tropical America, 1739 and 1890. Greenhouse or half-hardy shrub. SYN. *C. Reinwardtii*.

FIG. 213. CASSEBEERA TRIPHYLLA.

C. bracteosa (large-bracted). A synonym of *C. didymobotrya*.

C. Burmanni (Burmann's). A synonym of *C. obovata*.

C. calliantha (beautiful-flowered). A synonym of *C. multijuga*.

C. coquimbensis (Coquimbo). *fl.* 1½in. in diameter; sepals oblong, obtuse, about half the length of the orange-yellow petals; dorsal petal obcordate, the two lateral ones broadly obovate, the anterior ones smaller, obovate-oblong; cymes axillary, many-cleft, sub-corymbose. September. *fr.*, pods about 4in. long, over ½in. broad, stipitate, flattened, acute at base, mucronate at tip. *l.* 2in. to 4in. long; leaflets four to six pairs, four to eight lines long, sessile, elliptic-oblong or almost rounded, apiculate, pale green. Chili, 1886. Greenhouse shrub. (B. M.7002.)

C. didymobotrya (twin-clustered). *fl.* orange; racemes simple, erect, 6in. to 12in. long, corymbose, from the axils of the upper leaves; bracts caducous, ½in. long. *l.* 6in. to 16in. long; leaflets four to six pairs, oval or elliptic, obtuse or scarcely acute. *h.* 7ft. to 10ft. Angola, 1866. Greenhouse shrub or small tree. SYN. *C. bracteosa*.

C. Fistula (Fistula). *fl.*, calyx ¼in. to ½in. long, caducous; petals veined bright yellow, ¾in. to 1in. long, obovate, shortly clawed; racemes as long as the leaves. *fr.* cylindrical, almost woody, 8in. to 10in. long. *l.* 1ft. or more in length; leaflets eight to sixteen, 2in. to 6in. long, ovate, narrowed to the apex, distinctly stalked, pale green, strongly veined. *h.* 20ft. to 30ft. India, &c. An erect tree.

C. multijuga (many-paired). *fl.* large, in terminal racemes. *l.* twenty to twenty-five pairs, oblong-linear or oblong-elliptic, glabrous, somewhat whitish beneath. Brazil, 1869. Tree. SYN. *C. calliantha*.

C. obovata (obovate). *fl.*, sepals glabrous, very obtuse; corolla pale yellow, medium-sized; racemes narrow, distinctly pedunculate, equalling or exceeding the leaves. July. *fr.* reniform. *l.* distinctly petiolate, 2in. to 3in. long; leaflets obovate-oblong, membranous, very glaucous, obtuse. *h.* 1ft. to 4ft. India, &c., 1640. Annual. SYNS. *C. Burmanni*, *C. Senna*.

C. Reinwardtii (Reinwardt's). A synonym of *C. bicapsularis*.

C. Senna (Senna). A synonym of *C. obovata*.

CASSINE. *Maurocenia* is synonymous with this genus.

CASSINIA. This genus includes about eighteen species, natives of Australia, New Zealand, and South Africa. Leaves small, persistent. To the species described on p. 276, Vol. I., the following should be added:

C. fulvida (fulvous). *fl.-heads* white, ⅛in. to ¼in. long, in termina corymbs of four or five. *l.* ¼in. to ½in. long, linear, obtuse fulvous beneath, shining above. *h.* 10ft. to 15ft. New Zealand. Plant glutinous. (R. G. 1890, p. 241, f. 56.) SYN. *Diplopappus chrysophyllus* (of gardens).

C. leptophylla (smooth-leaved). *fl.-heads* white, ⅛in. to ¼in. long, in terminal, hemispherical corymbs. August. *l.* erect or spreading, rarely recurved, $\frac{1}{12}$in. to $\frac{1}{20}$in. long, glabrous above, tomentose beneath. *h.* 10ft. to 15ft. New Zealand, 1821. (P. F. G. iii., p. 16.)

CASSINIACEÆ. Included under **Compositæ** (which *see*).

CASSIOPE. To grow the members of this genus satisfactorily a thoroughly well-drained, moist, peaty soil, and a position just shaded from the fierce mid-day sun is advisable. On no account should water be allowed to become stagnant at the roots, or failure will result.

CASSIPOUREÆ. Included under **Rhizophoreæ** (which *see*).

CASSUVIUM. A synonym of **Anacardium** (which *see*).

CASSYTHEÆ. A tribe of **Laurineæ** (which *see*).

CASTALIA. A synonym of **Nymphæa** (which *see*).

CASTANEA. Only the two species described on p. 277, Vol. I., are contained in this genus. *See also* **Castanopsis**.

C. americana (American). A variety of *C. sativa*.

C. chrysophylla (golden-leaved). A synonym of *Castanopsis chrysophylla*.

C. japonica (Japanese). A form of *C. sativa*.

C. sativa americana (American). *fr.* smaller and sweeter than in the type. *l.* acute at the base; young ones lepidote, puberulous. United States.

C. s. japonica (Japanese). A variety having the under-side of the young leaves covered with white pubescence. Japan, 1889.

C. vulgaris (common). A synonym of *C. sativa*.

C. crenata and *C. dentata* are other good kinds.

CASTANEACEÆ. Included under **Cupuliferæ** (which *see*).

CASTANEOUS. Chestnut-coloured.

CASTANOPSIS (from *Kastanon*, a Chestnut, and *opsis*, resemblance; this genus is related to *Castanea*). ORD. *Cupuliferæ*. A genus embracing about twenty-five species of stove, greenhouse, or hardy trees, rarely shrubs; one is found in California, and the rest are Asiatic. In habit they closely resemble some of the Oaks; but they differ in the closed fruiting involucre, enclosing one to four nuts, being covered with spines or tubercles, and often splitting irregularly. Two of the species have been introduced, but only one calls for mention here. It thrives in ordinary soil, in any sheltered spot, and may be propagated by cuttings.

C. chrysophylla (golden-leaved). *fl.*, catkins dense, one-half the length of the leaves. *fr.* densely echinate, maturing in the second year. *l.* 4in. to 5in. long, broadly lanceolate, acuminate, acute at base, entire, coriaceous, deep green above and (especially the young ones) golden-lepidote below, becoming fuscous when old. Oregon, 1848. A dwarf, evergreen shrub. (G. C. 1897, ii., p. 411, f. 20.) SYN. *Castanea chrysophylla* (B. M. 4953).

CASTELA (a commemorative name). ORD. *Simarubeæ*. A small genus (six species) of stove or greenhouse, spiny, American shrubs, with inconspicuous, axillary flowers, and small, alternate, simple leaves. Two species have been introduced, but they are of little horticultural value. One of them, *C. Nicholsoni* (Goatbust), is remarkable for its bitterness, which resembles that of Quassia.

CASTILLEJA. Painted Cup. About twenty-four species, mostly North American, are included in this genus.

CASTRA. A synonym of **Trixis** (which *see*).

CASUARINA. The species of this genus (*i.e.*, of the natural order *Casuarineæ*) number about two dozen. To those described on p. 278, Vol. I., the following should be added:

C. africana (African). A synonym of *C. equisetifolia.*

C. indica (Indian). A synonym of *C. equisetifolia.*

C. nodiflora (node-flowering). *fl.*, male amenta terminal, short; cones sub-terminal, sub-globose, small, about eight-ranked. Branchlets slender, rather short, undivided or slightly branched, four-angled. New Caledonia, 1823.

C. stricta, of Miquel. A synonym of *C. distyla.*

C. sumatrana (Sumatran). *fl.*, cones sub-terminal, large, ellipsoid or globose. Branchlets dense, very slender, triquetrous. Sumatra, 1832. An excessively branched shrub or tree, useful for bouquets on account of its plumose branchlets.

CATACHÆTUM. *See* **Catasetum.**

CATAKIDOZAMIA. Included under **Macrozamia** (which *see*). *C. Macleayi* is a synonym of *Macrozamia Perowskiana.*

CATALPA. About half-a-dozen species are embraced in this genus; they are found in China, Japan, North America, and the West Indies. To the species, &c., described on pp. 278-9, Vol. I., the following should be added:

C. bignonioides. Of this species there are several varieties in cultivation in European gardens—*aurea* (golden), *foliis argenteis variegata* (having silvery-variegated leaves), *grandiflora* (large-flowered), and *purpurea* (purple).

C. cassinoides (Cassine-like). A form having leaves intermediate between those of *C. Bungei* and *C. speciosa.* Brazil, 1890.

C. cordifolia (cordate-leaved). The plant so-called in gardens is a very hardy and vigorous form of *C. bignonioides.*

C. Kæmpferi nana (dwarf). A synonym of *C. (K.) Wallichiana.*

C. umbraculifera (umbrella-bearing). A handsome shrub or small tree, 9ft. to 12ft. high, with a rounded, compact head. China, 1838. Perhaps a garden variety.

C. Wallichiana (Wallich's). This is thought to be a Chinese form of *C. Kæmpferi*; it is of rather low growth. 1890. SYN. *C. Kæmpferi nana. C. pumila* and *C. Thunbergi* have been introduced to Continental gardens.

CATAPPA. Included under **Terminalia** (which *see*).

CATARIA. A synonym of **Nepeta** (which *see*).

CATASETUM. SYN. *Catachætum.* Including *Monachanthus.* This genus comprises upwards of eighty species, mostly natives of tropical America, extending from Brazil as far as Mexico. Lip fleshy, sessile at the base of the column; pollen masses four. To the species and varieties described on pp. 279-80, Vol. I., the following should be added:

C. apertum (open). *fl.* apple-green, spotted with brown; segments concave, forming a kind of cup; scape erect, 6in. long. *l.* lanceolate, 6in. long. Pseudo-bulbs fusiform, 5in. long. Habitat not recorded, 1895. Allied to *C. macroglossum.*

C. atratum (dark). *fl.*, sepals and petals green outside, shaded and spotted with purple on the inside; lip green, fringed, with a yellow, recurved flap at the end; raceme decurved. July. Brazil. (W. O. A. x., t. 480.)

C. barbatum proboscideum (proboscis-like). This only differs from the type in the beard of the lip being green. 1889.

C. b. spinosum (spiny). *fl.*, sepals and petals green, barred with brown, narrower than in the type; lip white, with a spine-like point at the apex. 1891. (L., t. 293.)

C. Bungerothi (Bungeroth's).* *fl.* white, very showy; sepals and petals lanceolate, very acute, spreading; lip large, transversely oblong, deeply concave, shortly and obtusely spurred, bidentate at apex; racemes many-flowered. *l.* lanceolate, very acute, 8in. to 9in. long, 1½in. to 2in. broad. Pseudo-bulbs fusiform, 5in. to 9in. long. Equatorial America, 1887. (B. M. 6998; G. C. ser. iii., i., p. 142; I. H. ser. v. 10; W. O. A. viii., t. 352.) See Fig. 214.

C. B. album (white). *fl.* pure white with the exception of a delicate rose-coloured spot on the lip. 1888.

C. B. aureum (golden). *fl.* light yellow. Venezuela. A distinct variety. (L. iii., t. 116.)

Catasetum—*continued.*

C. B. Pottsianum (Potts'). *fl.*, petals prettily marked with purple; centre of the lip having a few spots. 1887. (L. iii., t. 104.)

C. B. Randi (Rand's). *fl.* yellow, with a spot of deep apricot-yellow in the spur. 1890. (I. H. xxxvii., t. 117.)

C. chloranthum (yellow-flowered). *fl.* generally rather larger than in *C. macrocarpum* (which this species resembles in general aspect); sepals pale green, with rosy blotches; petals also pale green, but more heavily blotched. 1894.

C. Christyanum (Christy's). *fl.* large, spreading, each with a narrow bract at base; sepals dark reddish- or chocolate-brown, the dorsal ones erect, the lateral ones spreading; petals lighter brown, pale-spotted at base; lip green and purplish, short, with a bluntly-conical, saccate pouch and a three-lobed limb, the lateral lobes with long, purple fringes; raceme erect, six-flowered. Autumn. *l.* lanceolate-lorate, acuminate, plaited. Stems fusiform, jointed, 6in. to 8in. long. Amazons. (W. O. A. 83.)

C. C. obscurum (obscure). *fl.*, sepals and petals blackish-purple; side lobes of the lip dark, rich purple, the middle lobe brownish-olive-green, and the wall around the mouth of the apex light ochre, marked with red. 1885.

C. ciliatum (ciliated). *fl.* rather over 1in. across, somewhat resembling bees on the wing; sepals and petals greenish-yellow, the latter erect, the former reflexed; lip whitish, triangular, concave, tipped with maroon-purple, and having purple bristle-like hairs ⅛in. long on the sides near the base; pedicels and column purplish. Amazons, 1891.

C. Claveringii (Clavering's). A synonym of *C. macrocarpum.*

C. collare (banded). *fl.*, sepals bright green; petals whitish-green; lip white, slightly shaded with green on the outer surface, very thick and fleshy. Venezuela, 1895.

C. costatum (ribbed). *fl.*, sepals and petals yellowish; side lobes of the lip erect, triangular, the upper border ciliated; "the mid-lobe . . . . goes out into a low, blunt, small triangle, standing over the long, blunt conus, so very remarkable by the presence of some lighter ribs running at each side, but which are not very conspicuous as long as the lip is fresh" (Reichenbach). 1887.

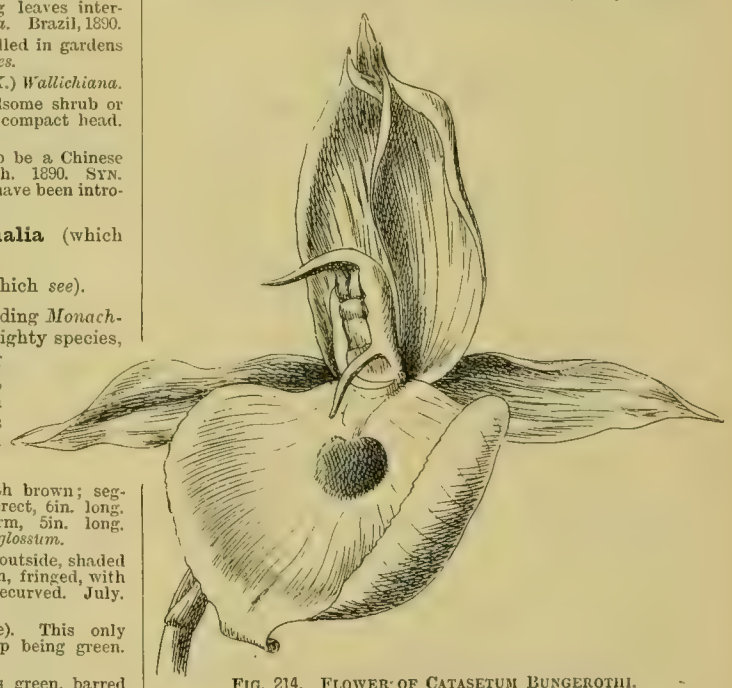


FIG. 214. FLOWER OF CATASETUM BUNGEROTHI.

C. cristatum stenosepalum (narrow-sepaled). *fl.*, sepals purplish-brown, narrow; petals entire, purple, striated with dark purple. 1887. (I. H. ser. v., t. 71.)

C. decipiens (deceptive). *fl.*, sepals and petals brownish-purple, with darker spots, lanceolate, acute; lip yellow outside, light brown inside, cup-shaped; column white, having two long spurs; inflorescence pendent. Venezuela, 1888. *l.* lanceolate, acute. Pseudo-bulbs fusiform, 3in. to 4in. long. (L. iii., t. 144.)

Catasetum—*continued.*

C. discolor (two-coloured). *fl.* in erect spikes, produced from the base of the pseudo-bulbs; sepals and petals greenish; lip yellow outside, hairy and lined with brown inside, cup-shaped, with two purplish lateral fringes. Pseudo-bulbs narrow, tapering. Pernambuco, 1844. (L. i., t. 38.)

C. d. vinosum (wine-red). *fl.* of a vinous-red colour. Brazil, 1894.

C. ferox (fierce). *fl.* dirty green outside and pea-green within. spicate. Habitat not recorded, 1895.

C. fimbriatum (fringed). *fl.* yellowish-green; sepals linear, apiculate; petals rather longer, fleshy; lip fleshy, three-lobed, the lobes fringed with long, mostly bifid fimbriæ; scape about nine-flowered. August. *l.* lanceolate, acuminate, slightly plicate. Pseudo-bulbs about 6in. long, six- to eight-leaved. Pernambuco. (B. M. 7158.)

C. f. Cogniauxi (Cogniaux'). *fl.*, sepals white, spotted and suffused with rose-purple; lip deeply fringed, the lower part pale or greenish-yellow spotted with reddish-brown, the upper part whitish. 1895. (L. xi., t. 499.)

C. f. platypterum (broad-winged). *fl.* large; sepals and petals greenish-white, streaked and dotted with purplish brown; lip "Garlic-green." 1889.

C. f. viridulum (greenish). *fl.*, sepals and petals green, spotted with reddish-purple; column greenish-white, spotted with purple. 1886.

C. Finetianum (Finet's). *fl.* in lax spikes; sepals and petals whitish, suffused and spotted with purple, long and narrow; lip oblong, nearly acute at the tip, the margins entire, strongly incurved. Colombia, 1894.

C. galeritum (capped). *fl.* rather large; sepals and petals pale green, spotted brown, oblong, acute; lip pale green, saccate, oblong, conical at apex, ochreous in front, marked pale green around the mouth, and marked brown on a yellow ground inside; raceme several-flowered, lax. Colombia (?), 1886. (L. ii., t. 67.)

C. g. pachyglossum (thick-lipped). *fl.* having an almost square, thick, obtuse-angled lip. 1889.

C. Garnettianum (Garnett's). *fl.* about 1¾in. across; sepals and petals light green, thickly spotted with chocolate-brown, ⅜in. long; lip white, ⅜in. long, divided into bristles at the apex and with shorter bristles on the margins below the middle; scape erect, 4in. long, several-flowered. *l.* lanceolate, 4in. long. Pseudo-bulbs 1in. to 2in. long, compressed-ovate or conical. Allied to *C. barbatum*, but smaller. 1888. (B. M. 7069.)

C. glaucoglossum (glaucous-lipped). *fl.* large; sepals brown, ligulate, acute; petals glaucous, spotted brown, much larger than the sepals, oblong, acute; lip glaucous, spotted brown inside, having a depressed, rounded sac, and a triangular mouth; raceme stout, bearing several flowers, deflexed. Mexico, 1885. A curious species. (G. C. 1885, xxiv., p. 552.)

C. globiflorum (globe-flowered). *fl.*, sepals and petals olive-brown, concave, imbricated; lip glaucous, spotted with reddish-violet within and on the outer margin, globose-hemispherical; spike elongated, many-flowered. June. Brazil, 1840. (B. M. 3942.)

C. Gnomus (Gnome). *fl.*, sepals green, spotted with purple; petals violet; lip green at base, the hood slightly dotted with red; pedicels remote. *l.* oblong-lanceolate, sheathing at base. Pseudo-bulbs whitish, oblong-ovate, attenuated at apex. Brazil, 1877. (I. H. 1877, t. 270.)

C. hymenophorum (membrane-bearing). Allied to *C. chloranthum*, but differing in the general form and colour of the flowers; sepals a little more fleshy; lip forming a pouch relatively wider and shallower. South America, 1895.

C. Imperiale (imperial). A variety of *C. splendens.*

C. Imschootianum (Imschoot's). *fl.* yellow, numerous, disposed in an erect raceme; sepals and petals tinged with green; lip saccate, fleshy, nearly truncate, folded inwards. *l.* large, plicate. Pseudo-bulbs oblong-fusiform. Brazil, 1893. (L., t. 403.)

C. Lehmanni (Lehmann's). *fl.* in a loose, drooping raceme; sepals and petals green, equal, ovate, acute, connivent in a globe; lip yellowish-flesh-colour, semi-orbicular-saccate, trilobed. *l.* narrow-lanceolate. Colombian Andes, 1886. A curious but by no means beautiful species. (R. G. 1223, a-g.)

C. Lemosii (Lemos'). *fl.* 1½in. across; sepals and petals greenish-yellow; lip light green and yellow; scape 1ft. long, erect, many-flowered. *l.* 8in. long, 2¼in. broad. Pseudo-bulbs fusiform, 6in. long. Brazil, 1894. (B. M. 7444.)

C. Lichtensteinii (Lichtenstein's). *fl.* greenish and brown. 1892. Allied to *C. Trulla.*

C. Lindeni (Linden's). A variety of *C. splendens.*

C. longifolium (long-leaved). *fl.* greenish-yellow, tipped with crimson, broadly oblong, recurved; lip yellow, tipped with crimson, galeate, having a fringed membrane under the limb. August. *l.* linear-ligulate, 1½ft. long. Demerara, 1837. A fine species. (B. M. 3019; L. S. O. t. 31; Ref. B. t. 32; W. O. A. x., t. 456.) SYN. *Monachanthus longifolius.*

Catasetum—*continued.*

C. luridum (lurid). *fl.* globose; sepals and petals spotted; lip yellowish, fleshy, hood-like, the margins purple-spotted, neither ciliated, toothed, nor inflexed; raceme nearly 1ft. long, nodding at apex, few-flowered. Stems sulcate, 3in. to 5in. long. Bahia. (B. M. 3590.)

C. macrocarpum (large-fruited). The correct name of *C. tridentatum* (B. M. 3329). *fl.* about 4in. in diameter. (B. M. 2259; I. H. xxxiii., t. 569.) SYN. *C. Claveringii* (L. B. C. 1344).

C. m. bellum (pretty). A variety having purplish-brown sepals, and a large purplish-brown blotch on either side the lip. Brazil, 1886.

C. m. carnosissimum (very fleshy). This is described as "possibly a monstrosity between the male and the female of this species." 1895. (L. xi., t. 26.)

C. m. chrysanthum (yellow-flowered). A form with bright yellow flowers. South America. (L. v., t. 197.)

C. m. Lindeni (Linden's). A variety of *C. splendens.*

C. macroglossum (large-lipped). *fl.* very variable in colour—green, yellow, and brownish-purple; sepals and the broader petals oblong-ligulate; lip saccate; raceme few-flowered. Ecuador, 1877.

C. mirabile (remarkable). A natural hybrid, resembling *C. splendens Luciani.* 1895. (L. x., t. 456.)

C. O'Brienianum (O'Brien's). A form of *C. splendens.*

C. pallidum (pale). This species differs from *C. Finetianum* chiefly in having shorter sepals and petals and a more fleshy lip. Habitat not recorded, 1894.

C. Phasma (visionary). *fl.* rather large; sepals and petals dark green, with purplish-brown spots; limb of lip white, the side lobes erect, densely serrulated; column light green, spotted with brown. Eastern Brazil, 1877. Allied to *C. Gnomus.*

C. pileatum (capped). *fl.* white, rather large; sepals narrow-oblong, acute; petals broadly oblong, acute; lip large, broadly triangular, with a bluntly conical spur; column with a very long beak. Venezuela, 1886.

C. pulchrum (pretty). *fl.* five or six in a short raceme; sepals and petals light green, barred with chocolate-brown, elliptic, acute; lip deep yellow, oblong, saccate, obscurely three-toothed at apex. Pseudo-bulbs stout, fusiform, 4in. to 6in. long, ¾in. to 1in. thick, producing the racemes from the base. Brazil, 1888. (L. iii., t. 120.)

C. punctatum (dotted). *fl.* scented, 2in. across; sepals and petals yellowish-green, spotted with brown; lip dark yellow; scape 8in. long, bearing about a dozen flowers. *l.* broadly lanceolate, 10in. long. Pseudo-bulbs fusiform, 6in. long. Brazil, 1894.

C. quornus. A misprint for *C. Gnomus.*

C. Randii (Rand's). This differs from *C. Garnettianum* mainly in the lip having a short, broad, brush-like appendage. Brazil, 1894. (B. M. 7474.)

C. revolutum (revolute). *fl.* of the same texture as in *C. splendens*; sepals and petals pale greenish-yellow; lip forming a shallower and narrower pouch than in *C. splendens.* Habitat not recorded, 1894.

C. Rodigasianum (Rodigas'). *fl.* 3in. across, in a long raceme; sepals green spotted with brown outside, almost entirely brown inside; petals green, spotted with brown; lip yellow, spotted with purplish-brown, concave, three-toothed in front. Summer. Pseudo-bulbs thick, fusiform. Santa Catharina, Brazil, 1890. (L. vi., t. 259.) The variety *tenebrosum* has much darker flowers than the type. 1894.

C. sanguineum (bloody). *fl.* greenish, speckled with brown or dull red, not at all handsome, disposed in a close raceme; sepals and petals turned upwards; lip lacerated, except at the base. October and November. *l.* light glaucous-green. Pseudo-bulbs 6in. to 7in. long. Central America, 1850.

C. s. integrale (entire). *fl.* having the anterior lip wholly entire. 1887.

C. semiroseum (half-pink). A form of *C. splendens.*

C. splendens (splendid). *fl.* approaching those of *C. Bungerothi* in both form and colour, but a little smaller; spur rather more conical, deep yellow inside. 1894. A supposed natural hybrid between *C. Bungerothi* and *C. macrocarpum.*

The following varieties have been named: *acutipetalum, albo-purpureum, album, Aliciæ, atropurpureum, aurantiacum, aureo-maculatum, aureum, flavescens, Grignani, Imperiale* (L. x., t. 460), *Lansbergianum, leucanthemum, Lindeni, Luciani, macrocarpum luteo-roseum, maculatum, O'Brienianum, regale, rubiginosum* (L. 1897, t. 555), *rubrum, semi-roseum, viride, Worthingtonianum* (L. xi., t. 14.)

C. tabulare serrulata (serrulated). *fl.* green, yellowish-white, and bluish-white, the side margins of the lip serrulated. 1886. (R. G. 1223, h-m.) Other varieties are: *brachyglossum, lævе,* and *rhinophorum.* (G. C. 1895, ii., p. 44, f. 8.)

C. tapiriceps (tapir-headed). *fl.* numerous; sepals green; petals brown; lip orange, trigono-sacciform, the free margin toothleted,

Catasetum—*continued.*
the side laciniæ revolute, the middle one with a transverse, emarginate keel not far from the margin; column resembling "a Malayan tapir, with its curved trunk." Brazil, 1888.

C. tigrinum (tiger-marked). *fl.*, sepals and petals white, the latter unusually broad, all with numerous cinnamon-coloured bars; column and lip whitish-ochre; lip thick, narrow, triangular. Habitat not recorded, 1881. A curious species, allied to *C. barbatum.*

C. tridentatum. The correct name is *C. macrocarpum.*

C. trifidum (thrice-cleft). *fl.* greenish, dotted with purple, 1½in. long; sepals and petals converging from a spreading base; lip trifid; raceme drooping. June. *l.* oblong-lanceolate, shortly acuminate. Trinidad. (B. M. 3262.)

C. Trulla (trowel-shaped). *fl.* green and brown; sepals and petals spreading, oval, flat; lip much the shape of a trowel, not at all hollowed out into a bag, but merely concave like the bowl of a spoon, the edges fringed; column short, tendrilled. September. Tropical America, 1840. (B. R. xxvii. 34.)

C. T. maculatissimum (much-spotted). *fl.*, sepals, petals, and the anterior part of the sides of the column covered with brown spots; anterior side of the lateral lobes of the lip having well-developed fringes. 1888.

C. T. subimberbe (almost beardless). In this variety the lip is practically beardless. 1887.

C. uncatum (hooked). *fl.* green, numerous, disposed in an erect raceme. *l.* lanceolate, 1ft. long. Pseudo-bulbs fusiform, 3in. to 8in. long. Brazil, 1895.

C. viridi-flavum (green and yellow). *fl.* green; sepals and petals concave; lip marked with yellow on the inside, somewhat conical-saccate, hooded. Summer. *l.* oblong, acute. Central America, 1841. (B. M. 4017.)

The following have also been introduced: *C. incurvum* (SYN. *C. stupendum*), *C. mentosum*, *C. Oerstedii*, *C. triodon.*

CAT BERRY. *See* **Ribes Grossularia.**

CATCHFLY, GERMAN. *See* **Lychnis Viscaria.**

CATERPILLAR. This word is generally limited to the larval state of Lepidopterous insects (Moths and Butterflies). A Caterpillar is made up of a head and thirteen segments or body divisions. There are usually three pairs of thoracic legs and a variable number of what entomologists call abdominal feet. These latter are situate upon the hinder divisions of the body, and are variable in number. The latter pair of abdominal feet are modified for clasping. Abdominal feet are of temporary use, and finally are absorbed. The six thoracic legs are a practically constant feature in Lepidopterous larvæ, but there are a few isolated cases in which they are altogether wanting. In the changes which take place they are eventually employed in the production of the legs of the perfect insect.

CATERPILLAR PLANT. *See* **Scorpiurus.**

CATHA. *Methyscophyllum* and *Trigonotheca* are synonymous with this genus.

CATHA (of Endlicher). A synonym of **Gymnosporia** (which *see*).

CATHARANTHUS. Included under **Vinca** (which *see*).

CATHEA. A synonym of **Calopogon** (which *see*).

CATIMBIUM. A synonym of **Alpinia** (which *see*).

CAT-O'-NINE-TAILS. *See* **Typha latifolia.**

CATOPSIS. SYNS. *Pogospermum*, *Tussacia.* This genus embraces about fifteen species, natives of tropical America. Sepals and petals free to the base, the latter white or yellow; stamens shorter than the calyx; spikes simple or panicled. Leaves lorate or lanceolate, thin, nearly naked. The species (all of which are closely allied) are not much known in cultivation.

CAT'S-EAR. *See* **Antennaria.**

CATTERIDGE-TREE. *See* **Euonymus europæus.**

CATTLEYA. The species of this genus are all natives of the warmer parts of America, from Brazil to

Cattleya—*continued.*
Mexico. The following corrections of, and additions to, the information given on pp. 280-4, Vol. I., are based upon the monograph of the genus by Messrs. James Veitch and Sons, in Part II. of their "Manual of Orchidaceous Plants," and embrace the most recent introductions, but do not include the hosts of minor varieties that are never likely to be generally grown, or that are scarcely distinguishable from the typical plants. A list of the garden hybrids is appended.

C. Alexandræ (Alexandra's). A synonym of *C. elongata.*

C. amabilis (lovely). A synonym of *C. intermedia.*

C. amethystina (amethystine). A synonym of *A. intermedia.*

C. aurantiaca (orange). The correct name of *Epidendrum aurantiacum.*

C. aurea (golden). A variety of *C. Dowiana.*

C. autumnalis (autumnal). A garden synonym of *C. Bowringiana.*

C. bicolor Measuresiana (Measures'). A pretty variety, having the lip bordered with white. 1888. (W. O. A. 357.)

C. b. Wrigleyiana (Wrigley's). *fl.*, sepals and petals greyish-green; lip dark purple. 1885.

C. Bluntii (Blunt's). A form of *C. Mendelii.*

C. bogotensis (Bogota). A synonym of *C. Trianæi.*

C. Boissieri (Boissier's). *fl.*, sepals and petals soft rosy-lilac; lip broad, with a beautiful, curving, yellow blotch extending halfway down and nearly across it. *l.* oblong, short and broad. Colombia.

C. Bowringiana (Bowring's). *fl.* rich rosy-purple, about 2½in. in diameter, the front of the lip deep purple, with a transverse, maroon band, behind which the tube is whitish; raceme corymbose, five- to ten-flowered. Autumn. Central America, 1886. A charming species, allied to *C. Skinnieri.* SYN. *C. autumnalis* (of gardens). (J. H. 1886, xii., p. 397, f. 71-2; R., ser. ii., i., t. 2; R. H. 1890, p. 300; W. O. A. vii., t. 323.)

C. Brownii (Brown's). *fl.* about 4in. in diameter, five or more in a raceme; sepals and petals bright rose-purple, undulated; lip pale purple, three-lobed, with some darker veins. *l.* oblong, coriaceous. Pseudo-bulbs 2ft. high, two-leaved. Habitat not recorded, 1893.

C. bulbosa (bulbous). A synonym of *C. Walkeriana.*

C. candida (white). *fl.*, sepals and petals white, shaded pink; lip the same colour, with a dash of yellow in the centre; spike three- or four-flowered. July to November. *h.* 1ft. Brazil Allied to *C. intermedia.*

C. chocoënsis. This is now regarded as a variety of *C. Trianæi.*

C. coccinea (scarlet). A synonym of *Sophronitis grandiflora.*

C. crispa. This is now classed under *Lælia.*

C. dolosa. This is now regarded as a variety of *C. Walkeriana.*

C. Dormaniana (Dorman's). The correct name of *Lælia Dormaniana.* (W. O. A. 401.)

C. Dowiana. This is now regarded as a variety of *C. labiata.*

C. D. aurea (golden). *fl.* very large; sepals and petals pale yellow; lip rich, deep purple, veined with yellow. Colombia, 1883. A gorgeous variety. (W. O. A. 84.) SYN. *C. aurea* (I. H. 493).

C. Edithiana (Edith's). *fl.* 6in. to 7in. in diameter; sepals and petals light mauve; lip white, striped mauve, the disk buff. *l.* dark green. *h.* 1ft. Brazil. Habit like *C. Mossiæ.*

C. Eldorado. This is now regarded as a variety of *C. labiata.*

C. E. crocata (saffron-coloured). *fl.* broad, white, with a broad, deep orange line running from the base of the lip on the anterior disk, where it expands into a pentagonal blotch, with teeth in front. 1885.

C. E. Oweni (Owen's). *fl.* white; lip having a yellow blotch and a band of rosy-crimson. 1894. (L., t. 409.)

C. E. virginalis (virgin-white). *fl.* sweet-scented; sepals and petals snow-white, the former lanceolate, acute, the latter broad, elliptic, obtuse; lip white, with a yellow disk and tube, entire, with a frilled front lobe. August and September. Amazon Country. SYN. *C. virginalis* (I. H. ser. iii. 257). The form *rosea* has a distinct, rosy-purple blotch on the front of the anterior portion of the lip.

C. E. Wallisii (Wallis'). *fl.*, segments white, the orange-yellow disk of the lip reduced in size.

C. elegans (elegant). A synonym of *Lælia elegans.*

C. elongata (elongated).* *fl.*, sepals and petals clear green, spotted with rich brown and tinted with violet on the margin, 2in. long, ½in. broad; lip rosy-violet; peduncles 1½ft. to 1½ft. long. Autumn. Pseudo-bulbs cylindrical, 1ft. to 1½ft. long. Brazil,

Cattleya—*continued.*

1892. Allied to *C. guttata Leopoldi.* (B. M. 7543.) SYN. *C. Alexandræ* (L. viii., t. 358).

C. felix (fruitful). A synonym of *Lælia felix.*

C. floribunda (abundant-flowered). *fl.* carmine, white, or variously coloured; scapes long, bearing about a score of flowers. Habitat not recorded, 1895. Described as possibly a natural hybrid between *C. maxima* and *C. labiata.*

FIG. 215. FLOWER OF CATTLEYA FORBESI.

C. Forbesi (Forbes'). *fl.* 3in. to 4in. in diameter; sepals and petals pale yellowish-green, sub-equal; lip three-lobed, the two lateral lobes yellow, sometimes streaked red, convolute over the column, the middle lobe pale yellow, with a broad, bright yellow, central band; column yellow, spotted and stained red; peduncles erect, two- to five-flowered. *l.* ovate-oblong, coriaceous. Stems about 1ft. high, two-leaved. Rio de Janeiro, 1823. (B. M. 3265; B. R. 953.) See Fig. 215.

C. Gaskelliana (Gaskell's). A variety of *C. labiata.*

C. gigas. This is now regarded as a variety of *C. Warscewiczii.*

C. granulosa asperata (rough). *fl.*, sepals and petals brownish, spotted dark purple; lip yellowish at base, light vivid purple with a broad white border in front, rough. 1886.

C. g. Banneri (Banner's). *fl.* about 6in. across; sepals and petals suffused with bright lurid purple. 1896.

C. g. Buyssoniana (Buysson's). *fl.* having the sepals and petals ivory-white. 1890. (G. C. 1890, viii., p. 588, f. 116; L., t. 270.)

C. g. Schofieldiana (Schofield's). *fl.*, sepals and petals greenish-yellow, spotted with crimson, the petals narrow at the base, very broad and obtuse at the apex; lip rich purple, with whitish side lobes, the middle lobe covered with lamellæ and papillæ. *l.* broad, two to a pseudo-bulb. Pseudo-bulbs 1½ft. high. SYN. *C. Schofieldiana* (W. O. A. ii. 93).

C. guttata immaculata (unspotted). *fl.*, sepals and petals mauve-brown, without spots; lip white, the front lobe purple. 1886. Of *C. g. Leopoldii* (shown in Fig. 216) there is a Heliotrope-scented form, *odoratissima.*

C. g. leopardina (leopard-spotted). *fl.* numerous and handsome; sepals and petals thickly spotted with dark brown; side lobes of the lip white, the broad, bilobed, front lobe rich purplish-red; racemes large. Pseudo-bulbs elongated. 1886.

C. g. Prinzii (Prinz'). A synonym of *C. amethystoglossa.*

C. Harrisoniæ (Mrs. Harrison's). This is now regarded as a variety of *C. Loddigesii.*

C. Holfordi (Holford's). A garden synonym of *C. luteola.*

C. imperialis (imperial). A synonym of *C. Warscewiczii.*

C. intermedia candida splendens (white, splendid). *fl.* pure white except the front lobe of the lip, which is carmine-purple. Rio Janeiro, 1890. (R. G. 1890, t. 1313.) *Parthenia* is another white-flowered form, and *Gibeziæ* (L. iii., t. 133) has similar blossoms with three orange lines on the disk. See Fig. 217.

C. iricolor (rainbow-coloured). *fl.* milk-white, with a few purple marks on the lip, 3in. to 4in. across; petals narrower than the sepals; lip obscurely three-lobed, the two lateral lobes convolute over the column; peduncles two- or three-flowered. *l.* 1ft. long, strap-like, complicate at base, emarginate at apex. Stems 4in. to 5in. long, one-leaved. Native country unknown.

Cattleya—*continued.*

FIG. 216. FLOWER OF CATTLEYA GUTTATA LEOPOLDII.

C. Kimballiana (Kimball's) *fl.* large; sepals and petals of a delicate rosy-white, the former lanceolate, acute, the latter very broad, elliptic, wavy; tube of the lip white outside, with some yellow near the front margins, the inside yellow with some orange lines, the wavy front lobe rich purple on the front part. Venezuela, 1881. A fine species.

C. labiata. The following are now included here as varieties: *Dowiana, Eldorado, gigas, Luddemanniana, Mendelii, Mossiæ, Percivaliana, Trianæi, Warneri,* and *Warscewiczii.*

FIG. 217 FLOWER OF CATTLEYA INTERMEDIA CANDIDA SPLENDENS.

Cattleya—*continued.*

C. l. Gaskelliana (Gaskell's). *fl.* 7in. across, resembling those of *C. Mossiæ*, but paler; lobes of the lip confluent, crisped, yellow within. Autumn. Brazil. A magnificent plant. (I. H. 1886, t. 613, under name of *C. Gaskelliana.*) The form *alba* has white flowers with a yellow throat.

C. Lawrenceana (Sir Trevor Lawrence's). *fl.* purplish-lilac, as large as those of a good *C. Trianæi*; sepals uncommonly broad; petals broader than the sepals, usually blunt; lip pandurate, emarginate, rather broader in front than at the base; the anterior part of the darkest, warmest purple, the side wings purple, the centre light yellow. British Guiana, 1885. A fine species. (B. M. 7133; G. C. n. s., xxiii., pp. 374-5; L., t. 44.)

C. L. concolor (one-coloured). *fl.* wholly of a light purple. 1886.

C. Leopoldii (Leopold's). A variety of *C. guttata.*

C. Lindleyana. This is now classed under *Lælia.*

C. lobata. This is now classed under *Lælia.*

C. Loddigesii candida (white). *fl.* white, with a yellow disk to the lip.

Cattleya—*continued.*

C. L. Harrisoniæ (Mrs. Harrison's). The correct name of *C. Harrisoniæ.*

C. L. violacea (violet). *fl.* more deeply coloured than in the type.

C. Luddemanniana (Luddemann's). *fl.*, sepals and petals delicate purplish-rose; suffused white, the petals nearly three times as broad as the sepals, and gently undulated, chiefly in the distal half; convolute lobes of the lip of the same colour externally as the sepals and petals, the anterior lobe fine amethyst-purple, crisped, emarginate, with two pale yellow or white blotches at the entrance of the tube, between which are lines of amethyst-purple gently diverging from the base of the lip. September and October. This is a variety of *C. labiata.* SYN. *C. speciosissima.* See Fig. 218.

FIG. 218. FLOWER OF CATTLEYA LUDDEMANNIANA.

C. L. alba (white). *fl.* large, pure white, with a pale yellow stain on the disk of the lip. Also called *Sanderiana.*

C. luteola (yellowish). *fl.* yellow, 2in. across; sepals narrow-oval, blunt; lip white, with a yellow disk, cucullate, rounded and crenulate, velvety inside. Pseudo-bulbs oval, ancipitous, one-leaved. Brazil. (B. M. 5032; R. X. O. i. 83.) SYN. *C. Holfordi* (of gardens).

Cattleya—*continued.*

FIG. 219. FLOWER OF CATTLEYA MENDELII.

C. marginata. This is now regarded as synonymous with *Lælia pumila.*

C. maxima alba (white). *fl.* white, having the usual yellow and purple markings on the lip.

C. Mendelii. This is now regarded as a variety of *C. labiata.* See Fig. 219.

C. M. Bluntii (Blunt's). *fl.* white; lip stained yellow in the throat.

C. M. Kegeljani (Kegeljan's). *fl.* white except the disk of the lip, which is striped and shaded with sulphur-yellow. 1897 (L. 1897, t. 589.)

C. Mossiæ. This is now regarded as a variety of *C. labiata.*

C. M. Reineckiana (Reinecke's). *fl.*, sepals and petals pure white; lip having an orange disk, and rays of violet lines and dots towards the margin. 1884. See Fig. 220.

C. M. Wageneri (Wagener's). The correct name of *C. Wageneri.*

C. nobilior. This is now regarded as a variety of *C. Walkeriana.*

C. Obrieniana (O'Brien's). This closely resembles *C. Loddigesii* (of which it is sometimes classed as a variety), but the flowers are paler and the lateral lobes of the lip are shorter and smaller than in that species. Brazil. (R. ser. ii., t. 40, under name of *C. Loddigesii O'Brieniana.*)

C. Oweniana (Owen's). A form of *C. labiata.*

C. Percivaliana (Percival's). *fl.* smaller than in *C. Mossiæ*, but darker and richer in colour in the best forms; sepals and petals deep blush; lip intense magenta-crimson, margined with blush-pink, much fringed, the throat marked with golden and crimson lines. January and February. Colombia. A distinct form of *C. labiata.* (Gn., 1889, xxxv., p. 532; G. C. n. s., xxi., p. 178; R. i., t. 2; W. O. A. iii. 144.)

Cattleya—*continued.*

C. P. alba (white). *fl.*, sepals and petals pure white; lip white, with an orange stain in the throat. Brazil, 1834.

C. Pinelii (Pinel's). A synonym of *Lælia pumila præstans.*

C. porphyroglossa (purple-tongued). *fl.*, sepals and petals of a light chestnut-brown; lip very fine, the stalk of the anterior lacinia crenulated or serrated at the edges, the central lacinia much keeled; column white at back, yellow covered with purple stripes in front. Brazil, 1837. This species resembles *C. guttata*, but has larger flowers. (R. X. O., ii., t. 171, f. 1, t. 172, f. 2.)

C. pumila. This is now regarded as synonymous with *Lælia pumila.*

C. Regnelli. This is now regarded as synonymous with *C. Schilleriana.*

C. Reineckiana (Reinecke's). A variety of *C. Mossiæ.*

C. Rex (King). *fl.*, sepals white, tinged with primrose-yellow, 3½in. long; petals creamy-white, 3½in. long, wavy-edged; lip white, yellow, and red, the column white. Habitat not recorded. 1890. Probably a form of *C. Dowiana aurea.* (G. C. 1891, ix., p. 273, f. 61; J. H. 1892, p. 170, f. 24; L. vi., t. 265.)

C. Rollissonii (Rollisson's). A synonym of *C. Trianæi delicata.*

C. Sanderiana (Sander's). A synonym of *C. Warscewiczii.*

C. Schilleriana Lowii (Low's). *fl.* of a pleasing lavender-blue; lip streaked with a darker shade of the same colour. 1892. (J. H. 1892, p. 187, f. 26.)

C. Schofieldiana (Schofield's). A variety of *C. granulosa.*

C. Schrœderæ (Baroness von Schrœder's). *fl.* generally very light purple, exquisitely perfumed, easily distinguishable from *C. Trianæi* by the extraordinary crispation of both petals and lip, and by the well-known orange area of the lip reaching far nearer the apex. 1887.

C. Skinneri alba (white). A variety with pure white flowers. (W. O. A. iii., t. 112.)

C. S. parviflora (small-flowered). *fl.* half the size of those of the type; lip whole-coloured, not pallid over the lower half. (B. M. 4916.) The following are sub-varieties: *alba*, snow-white, with a small primrose blotch on the lip, and, occasionally, some mauve-purple markings at the base (W. O. A. iii. 112); *oculata*, with a large, maroon-purple blotch on the lip.

C. speciosissima (very showy). A synonym of *C. Luddemanniana.*

C. suavior (sweeter). *fl.*, sepals and petals pale rosy-lilac, suffused white; side lobes of the lip white, tinted pale lilac towards the margins; middle lobe amethyst-purple, with a crisped margin and a deep sinus or cleft in the anterior margin; disk creamy

FIG. 220. FLOWER OF CATTLEYA MOSSIÆ REINECKIANA.

Cattleya—*continued.*

FIG. 221. FLOWER OF CATTLEYA SUPERBA ALBA.

white, a purple band extending below it to the base. A natural hybrid between *C. intermedia* and *C. Mendelii.*

C. superba alba (white). A beautiful variety with pure white flowers. 1890. See Fig. 221.

C. Trianæi [the correct spelling]. This is now regarded as a variety of *C. labiata.*

C. T. alba (white). *fl.* white, with the usual yellow disk of the lip, in front of which is a small blotch varying in colour from rosy-purple to pale-lilac.

C. T. Backhousiana (Backhouse's). *fl.* very large; sepals and petals blush-pink; lip large, with a bright magenta stain on the anterior part, the throat marked pale yellow.

C. T. chocoënsis (Choco). The correct name of *C. chocoënsis.*

C. T. delicata (delicate). *fl.* 6in. across; sepals and petals white; lip large, with a beautiful yellow centre and a tinge of rose, white outside. December and January. *h.* 1ft. Brazil, 1861. SYNS. *C. Rollissonii* (F. M. 1861, 8), *C. Warscewiczii delicata* (W. S. O i. 4). *superba* is a fine variety, with a very large lip.

FIG. 222. FLOWER OF CATTLEYA WALKERIANA.

Cattleya—*continued.*

C. T. Leeana (Lee's). *fl.* about 7in. in diameter; sepals and petals rosy-lilac, 3in. across; lip deep magenta-mauve; faintly margined lilac-rose, 2in. in diameter in the fore part; throat striped orange, very large and open.

C. T. rosea (rosy). *fl.*, sepals and petals rose-coloured; lip bright rosy-lilac, with a yellow blotch at the mouth of the throat.

C. velutina (velvety). *fl.* very fragrant; sepals and petals pale orange, spotted and streaked purple; lip orange at base, white with violet veins in front, where the surface is velvety. Brazil. The habit of this supposed natural hybrid closely resembles that of *C. bicolor.* (G. C. 1872, p. 1259; R. G. 1888, t. 1265; W. O. A., i., t. 26.)

C. virginalis (virgin-white). A form of *C. Eldorado.*

C. Wageneri (Wagener's). This is now regarded as a variety of *C. Mossiæ.*

C. Walkeriana. SYN. *C. bulbosa.* In addition to *C. Schrœderiana, C. dolosa* and *C. nobilior* are now regarded as forms of this species. See Fig. 222.

C. Wallisii (Wallis'). A form of *C. Eldorado.*

C. Warneri. This is now regarded as a variety of *C. labiata.*

C. Warscewiczii. This is now regarded as a variety of *C. labiata.* SYN. *C. Sanderiana.*

C. W. delicata (delicate). A synonym of *C. Trianæi delicata.*

C. W. franconvillensis (Franconville). *fl.* pure white with the exception of a purplish-crimson blotch on the lip. 1893. (W. O. A., t. 505).

Though practically no new species of *Cattleya* have been introduced since the original volumes were issued, we have to record as worthy of note the reintroduction (after its habitat had been practically lost for forty years) of the true autumn-flowering variety of *C. labiata.* It is now one of the most abundant and useful of the genus. With the increased numbers of this lovely variety, many choice and desirable forms have appeared, varying from pure white to depths of colour unknown in any other Cattleya.

To the work of the hybridist we turn with pleasure, and note the vast strides that have been made. The increase in variety which has been obtained by the intercrossing of the various species of Cattleyas has been little short of remarkable. Hybrid Cattleyas, during the past five years, have increased more than fifty per cent. The increase of the bigeneric hybrids (a list of which is given under Lælio-Cattleyas) have increased rather more than eighty-five per cent. during that period. One of the greatest advantages that have been gained by the intercrossing of the species is that the offspring from such usually flowers at periods intermediate between the parent species. For example, an autumn-flowering species crossed with one of the summer-flowering ones, in the majority of cases produces a winter-flowering offspring. So that by careful selection it is now possible to obtain a succession of plants flowering throughout the year.

For the guidance of those interested in the raising of seedlings, and as an assistance to their nomenclature, we append a list of hybrids, with their recorded parentage. It includes practically all the varieties that have been introduced up to date. In addition to the Lælio-Cattleyas already noted, there will be other bigeneric hybrids, such as Sophro-Cattleyas, Epi-Cattleyas, Epiphronites, &c., under which the offspring of such crosses will be found.

Aclandi-Loddigesii	*Loddigesii* and *Aclandiæ* (Veitch).
Adela	*Trianæi* and *Percivaliana* (Veitch).
Alberta	*Loddigesii* and *superba* (Imschoot).
Alberti	Syn. *porphyrophlebia* (Bleu).
Apollo	*Mossiæ* and *Aclandiæ* (Veitch).
Ariel	*Bowringiana* and *Gaskelliana* (Veitch).
Arthuriana	*luteola* and *Dormaniana* (Dorman).
Ashtonii	*Harrisonæ* and *Warscewiczii* (Hollington).
Astrea	*Skinneri* and *Loddigesii* (Maron).
Atalanta	*guttata Leopoldii* and *Warscewiczii* (Veitch).
Aurore	Syn. *Kienastiana.*
Ballantineana	*Trianæi* and *Warscewiczii* (Sander).
Baron Schröder	*Trianæi* and *dolosa* (Sander).
Bowringiana - blessensis	*Bowringiana* and *blessensis* (Maron).
Brabantiæ	Syn. *Aclandi-Loddigesii* (Veitch).
Breauteana	Syn. *Alberta* (Maron).

Cattleya—*continued.*

Browniæ	*Harrisoniæ* and *Bowringiana* (Sander).
Burberryana	*intricata* and *superba* (Sander).
calummata	*intermedia* and *Aclandiæ*.
Cecilia	*Lawrenceana* and *Trianæi* (Ingram).
Chamberlainiana	*guttata Leopoldii* and *Dowiana* (Veitch).
Chloe	*Bowringiana* and *bicolor* (Veitch).
Chloris	*Bowringiana* and *maxima* (Veitch).
citrino-intermedia	Syn. *Lambhurst Hybrid* (Dr. Harris).
Clesiana	Syn. *intermedia-Loddigesii* (natural hybrid) (Linden).
Comfrey	Syn. *Jupiter*.
Dominiana	*maxima* and *intermedia* (Veitch).
Dubiosa	*Trianæi* and *Harrisoniæ* (Maron).
Eclipse	*maxima* and *Skinneri* (Ingram).
elata	*Trianæi* and *Lawrenceana* (Ingram).
elatior	*Schilleriana* and *Mossiæ Reineckiana* (Ingram).
Ella	*bicolor* and *Warscewiczii* (Veitch).
Elvina	*Trianæi* and *Schilleriana* (Veitch).
Empress Frederick	*Mossiæ* and *Dowiana* (Veitch).
Enid	*Mossiæ* and *Warscewiczii* (Veitch).
Eros	*Mossiæ* and *Walkeriana* (Veitch).
Euphrasia	*Warscewiczii* and *superba* (Veitch).
Eurydice	*labiata vera* and *Aclandiæ* (Veitch).
Fabia	*labiata vera* and *Dowiana* (Veitch).
Fabiola	*Bowringiana* and *Harrisii* (Veitch).
Fenillata	*Leopoldii* and *superba* (Maron).
Fernand Denis	*Aclandiæ* and *Warscewiczii* (Maron).
fimbriata	Syn. *calummata*.
Firefly	*Dormaniana* and *Bowringiana* (Ingram).
flavescens	*Trianæi* and *luteola* (Maron).
Fowlerii	*Leopoldii* and *Hardyana* (Sander).
Gaudii	*Leopoldii* and *Loddigesii* (Maron).
Gertrude	*superba* and *Mossiæ* (Veitch).
Hardyana	*Warscewiczii* and *Dowiana aurea* (Cookson).
Harold	*Gaskelliana* and *Warscewizii* (Cookson).
Harrisii	*guttata Leopoldii* and *Mendelii* (Dr. Harris).
Hislopii	Syn. *Preciosa*.
hybrida	*guttata* and *Loddigesii* (Veitch).
intermedio-Percivaliana	*intermedia* and *Percivaliana* (Maron).
intertexta	*Mossiæ* and *Warnerii* (Veitch).
Johnsoniana	Syn. *Minucia*.
Juliet	*Mossiæ* and *labiata* (Veitch).
Juno	*Forbesii* and *velutina* (Roebling).
Jupiter	*Lawrenceana* and *Warscewiczii* (Ingram).
Kienastiana	*Luddemanniana* and *Dowiana* (Sander).
La Belle	Syn. *Ashtoniana*.
Lady Ingram	*Eldorado* and *Dowiana aurea* (Ingram).
La Fontaine	*Mendelii* and *guttata* (Maron).
Lambhurst Hybrid	*citrina* and *intermedia* (Harris).
Lawre-Mossiæ	*Lawrenceana* and *Mossiæ* (White).
leucoglossa	*Loddigesii* and *Fausta* (Veitch).
Lord Marsham	Syn. *Breauteana* (Charlesworth).
Lord Rothschild	*Gaskelliana* and *Dowiana aurea* (Sander).
Louis Chaton	Syn. *Cecilia*.
Macænus	*Warscewiczii* and *superba* (Veitch).
maculata	*guttata* and *intermedia* (Veitch).
Maggie Raphael	*Dowiana aurea* and *Trianæi* (Leon).
Manglesii	*Luddemanniana* and *Loddigesii* (Veitch).
Mantinii	*Bowringiana* and *Dowiana aurea* (Mantin).
Maronii	*velutina* and *Dowiana aurea* (Maron).
Marriottiæ	*Eldorado* and *Warscewiczii* (Marriott).
Marstersoniæ	*Loddigesii* and *labiata vera* (Veitch).
Mars	*Lawrenceana* and *labiata vera* (Sander).
Mary Gratrix	*Harrisoniæ* and *granulosa* (Gratrix).
Massiliensis	*Trianæi* and *Dowiana aurea* (Fournier).
Melpomene	*Mendelii* and *Forbesii* (Veitch).
Minerva	*Bowringiana* and *Loddigesii* (Veitch).
Minucia	*Loddigesii* and *Warscewiczii* (Veitch).
Miranda	*Trianæi* and *guttata Prinzii* (Veitch).
Miss Endicott	*maxima* and *Loddigesii* (Chamberlain).
Miss Measures	*Luddemanniana* and *velutina* (Sander).
Miss Williams	*Harrisoniæ* and *Gaskelliana* (Temple).
Mitchelli	*guttata Leopoldii* and *Trianæi* (Ainsworth).
mollis	*superba* and *Gaskelliana* (Wigan).
Mrs. Herbert Greaves	Syn. *Miss Williams* (Leeman).
Mrs. J. W. Whiteley	*Bowringiana* and *Hardyana* (Miller).
Mrs. M. Wells	*Parthinia* and *Warnerii* (Sander).
Octave Doin	*Mendelii* and *Dowiana* (Leeman).

Cattleya—*continued.*

Œnone	*Mossiæ* and *labiata* (Veitch).
Olivia	*Trianæi* and *intermedia* (Veitch).
Parthinia	*calummata* and *Mossiæ Wagnerii* (Bleu).
Pheidona	Syn. *Dominiana*.
Philo	*Mossiæ* and *tricolor* (Veitch).
picta	*guttata* and *intermedia* (Veitch).
picturata	*guttata* and *intermedia* (Veitch).
porphyrophlebia	*intermedia* and *superba* (Veitch).
Portia	*Bowringiana* and *labiata vera* (Veitch).
Preciosa	*Luddemanniana* and *Lawrenceana* (Ingram).
Prince of Wales	Syn. *Parthinia* (Sander).
Princess	*Trianæi* and *Luddemanniana* (Veitch).
quinqueeolor	*Forbesii* and *Aclandiæ* (Veitch).
Rajah	Syn. *Ballantineana*.
Rossii	*Leopoldii* and *intermedia* (Sander).
Russeliana	*Warnerii* and *Schilleriana* (Mantin).
St. Benoit	*Schrœderæ* and *Aclandiæ* (Lawrence).
Sedenii	*Lawrenceana* and *Percivaliana* (Ingram).
suavior	*intermedia* and *Mendelii* (Veitch).
super-Forbesii	*Forbesii* and *superba* (Cypher).
Thorntonii	*Luddemanniana* and *guttata Prinzii* (Thornton).
Triumph	*Luddemanniana* and *Lawrenceana* (Ingram).
veriflora	*labiata vera* and *Trianæi* (Sander).
vestalis	*Dowiana aurea* and *maxima* (Veitch).
weedonensis	*Mendelii* and *granulosa* (Thornton).
Wendlandiana	*Bowringiana* and *Warscewiczii* (Veitch).
William Murray	*Mendelii* and *Lawrenceana* (Cookson).
Wilsonii	*bicolor* and *guttata* (Wilson).

The following are Natural Hybrids:

Aurora	*Regnierii* and *rosea*.
Barberiana	*vestita* and *Turnerii*.
Battalinii	*intermedia* and *bicolor*.
Brymeriana	*Eldorado* and *superba*.
Cupido	*Schrœderæ* and *Mendelii*.
Czar	*labiata vera* and *granulosa*.
Eyermanni	*vestita* and *Veitchii*.
flaveola	*intermedia* and *guttata*.
Hardyana	*Warscewiczii* and *Dowiana aurea*.
Imperator	Syn. *Czar*.
intermedio-Loddigesii	*intermedia* and *Loddigesii*.
intricata	*guttata* and *intermedia*.
Krameriana	*intermedia* and *Forbesii*.
Laucheana	*Sanderiana* and *veratrifolia* (Sander).
linliginosa	*labrosa* and *Veitchii*.
Lowryana	*intermedia* and *Forbesii*.
Lucieniana	*Forbesii* and *guttata*.
Massaiana	*Hardyana* var.
Measuresiana	*Aclandiæ* and *Walkeriana*.
Patrocinii	*Loddigesii* and *Leopoldii*.
resplendens	*granulosa* and *Schilleriana*.
scita	*guttata* and *intermedia*.
sororia	*Walkeriana* and *guttata*.
venosa	*Harrisoniæ* and *Forbesii*.
Victoria Regina	*guttata* and *labiata*.
Whiteii	*labiata* and *Schilleriana*.

CATTLEYA FLY (*Isosoma orchidearum*). This insect deposits its eggs in the eye of the young growth when the plant is in a dormant state. As a consequence, the growth does not advance much above 1in., swells in the centre, and generally exhibits a stunted appearance. If this growth is cut off at the base and split open, there will be disclosed from three to seven yellowish maggot-like creatures. After eating a large hole in the young growth, they become pupæ, and eventually emerge as perfect flies. They should be destroyed as soon as seen. Fumigation with a vaporising insecticide will effectually settle them before they have time to deposit their eggs. The roots, too, not infrequently, are pierced by the insects, and a warty growth results. The grubs should be picked out with a stout needle.

CAT WHIN. *See* **Ulex nanus.**

CAUCASIAN WALNUT. *See* **Pterocarya fraxinifolia.**

CAULIFLOWER DISEASE OF STRAWBERRY. A name applied to a most injurious disease caused by the minute animals known as Eelworms, or Nematoid Worms. *See* **Strawberry.**

CAULIFLOWERS. For autumn sowing the best are: Early London, Eclipse, Dwarf Erfurt, and Veitch's Autumn Giant. The last-named is a most reliable variety, as it never fails to form good heads the following summer, even in the hottest weather, when other varieties are failures in that respect. For spring sowing all those previously mentioned are valuable, as are also Early Snowball, First Crop, Dwarf Mammoth, and Walcheren.

CAUTLEYA (named in honour of Major-General Sir P. Cautley, F.G.S., 1802-1871, joint author, with Dr. Falconer, of the "Fauna antiqua sivalensis"). ORD. *Scitaminea*. A monotypic genus, included by some authorities under *Roscoea*. The species is a stove, perennial herb, requiring similar treatment to **Alpinia** (which *see*).

C. lutea (yellow). *fl.* 1½in. to 2in. long; calyx red-purple, tubular, two-cleft at mouth; sepals linear-oblong, obtuse, concave, the dorsal one erect, the lateral ones reflexed; corolla golden-yellow, the tube exserted; lateral staminode like the dorsal sepal, erect, the tips incurved; spike 4in. to 8in. high. August. *l.* 5in. to 10in. long, narrow-lanceolate, with a slender tip, bright green above, paler or suffused or streaked red-brown beneath. Stems 8in. to 18in. high, tufted, erect, leafy. Himalaya, 1837. (B. M. 6991.) SYNS. *Roscoea gracilis, R. lutea.*

CAVENDISHIA. This is now the correct name of **Proclesia** (which *see*), according to Bentham and Hooker. To the species described on p. 225, Vol. III., the following should be added:

C. spectabilis (showy). *fl.* white, shaded with pink, tubular, slightly swollen below, when in bud covered with rosy-carmine bracts; racemes compressed. *l.* oblong, acuminate, bright reddish-bronze when young, changing to bright green. Colombia, 1889. A handsome, somewhat climbing shrub.

CEANOTHUS. This genus embraces about twenty-eight species, all North American. To those described on p. 285, Vol. I., the following should be added:

C. americanus variegatus (variegated). A garden variety, having the leaves bordered with yellow. 1889.

C. axillaris (axillary). *fl.* pale lilac tinged with rose, in axillary and terminal thyrses. Summer. *l.* ovate-lanceolate, rounded-obtuse, dark green above, white-tomentose beneath. 1876. A form of *C. azureus*. (R. H. 1876, f. 14.)

C. Baumannianus (Baumann's). A synonym of *C. microphyllus*.

C. Delilianus (Delile's). This differs from *C. azureus* in having flowers of a paler blue, and larger leaves lightly pubescent beneath. Origin unknown. SYN. *C. pulchellus*.

C. elegans (elegant). A synonym of *C. thyrsiflorus*.

C. Fendleri (Fendler's). *fl.* snow-white, disposed in short, terminal racemes. *l.* varying from narrowly oblong to elliptic, ¼in. to 1in. long, somewhat narrowed and cuneate at base, obtuse or acute at apex, dark glossy green above, silky below. Colorado, 1893. A half-hardy, much-branched, thorny bush. *C. Fenolleri* is apparently a misprint for *C. Fendleri*.

C. Fenolleri. *See* **C. Fendleri.**

C. Fontanesianus (Fontanes'). A synonym of *C. ovatus*.

C. laniger (wool-bearing). A synonym of *Pomaderris lanigera*.

C. ovalis (oval). A synonym of *C. ovatus*.

C. ovatus (ovate). *fl.* usually on short peduncles. *l.* narrowly oval or elliptic-lanceolate, 1in. to 2in. long. *h.* 2ft. to 3ft. Otherwise like *C. americanus*. Texas, &c., 1888. Hardy. SYNS. *C. Fontanesianus, C. ovalis.*

C. prostratus (prostrate). *fl.* bright blue, in axillary clusters, borne on stout peduncles. *l.* ¼in. to 1in. long, obovate or oblong-cuneate, spinose usually only at the apex, one-ribbed, very thick, borne on short, slender petioles. Oregon, 1889. A hardy, prostrate, nearly glabrous shrub.

C. pulchellus (rather pretty). A synonym of *C. Delilianus*.

C. thyrsiflorus (thyrse-flowered). *fl.* bright blue, in dense, sub-compound panicles, terminating the usually elongated and somewhat leafy peduncles. *l.* oblong to oblong-ovate, 1in. to 1½in. long, rather thick, usually smooth and shining above, canescent beneath, glandular-serrulated. Branches strongly angled. California, 1861. A hardy, tall shrub or small tree. (G. C. 1896, ii., p. 363, f. 75.) SYN. *C. elegans* (I. H. 1860, t. 268).

CEBATHA. A synonym of **Cocculus** (which *see*).

CECIDOMYIA, or GALL MIDGES. ORD. *Diptera.* This is a genus of delicate-looking flies, whose wings contain very few nervures. The majority of the larvæ live in plants. Some are responsible for the peculiar Gall formations found upon the foliage of Limes, Willows, and many other trees; others deform the roots, the buds, the flowers, or even the stems. Yet others produce no Galls, but are destructive by living upon cereals, after the manner of the wheat pest known as the Hessian Fly (*Cecidomyia destructor*), which causes such widespread injury to cereal and grass crops in America and in Europe. It is only since 1886 that it has been regarded as a British insect. The name Hessian Fly was bestowed upon the insect by Americans, who suggested that it was introduced into that country with the straw used by the Hessian troops in 1778. The larvæ of certain species are remarkable as possessing a curious horny appendage upon the under-surface known as the breast-bone or anchor-process, the exact use of which is not known. Besides the injurious species there are others which may be considered beneficial, as they are carnivorous, feeding upon Aphides and Mites.

CECROPIA. Nearly forty species have been referred to this genus, but, according to the authors of the "Genera Plantarum," this number might be considerably reduced; they inhabit tropical America, from Brazil to Mexico. Flowers dicœcious, in numerous, very dense, cylindrical spikes on a common, axillary peduncle; male spikes thick; females slenderer. Fruit oblong, included in the very slender perianth. Leaves alternate, long-petiolate, large, peltate. To the species described on p. 285, Vol. I., the following should be added:

C. dealbata (whitened). *l.* large, soft, pubescent, palmate, light green above, glaucous beneath. Colombia, 1837. A fine Snake-wood, of ornamental character.

C. frigida is rare in cultivation.

CEDAR, PRICKLY. *See* **Cyathodes acerosa.**

CEDAR, SHARP. *See* **Acacia oxycedrus** and **Juniperus oxycedrus.**

CEDRUS. According to Sir J. D. Hooker, this genus is monotypic, with three marked forms, one (*C. Libani*, the typical form) Oriental, another (*C. atlantica*) Algerian, and the third (*C. Deodara*) Himalayan.

As the variegated forms cannot be depended upon to reproduce themselves from seed, propagation by artificial means must be adopted. The common Cedars form suitable stocks upon which to graft the ornamental varieties. The Larch, too, may be used as a stock, but it is inferior to the Cedars. In its early stages the Larch is very vigorous in growth, but with age plants that have been worked upon it present a rather unsightly appearance. Side-grafting is easy and effective. February is the best month for the operation. The scions should be taken from healthy trees and plunged in a warm (not too close) propagating-case, and shaded from the sun. When they have made a few inches of growth they should be hardened off, and kept growing in pots until they are planted out the following spring. A neat stake should be placed against each plant, and the leader secured to it. If the side-shoots grow too vigorously, they may be shortened a bit, in order to concentrate all the energies into the principal growth.

To the information given on pp. 285-7, Vol. I., the following should be added:

C. atlantica aurea (golden). A variety with golden leaves. It is constant. 1897. The typical species is shown in Fig. 223.

C. a. fastigiata (pyramidal). A garden shrub or tree of pyramidal habit, with ascending branches. 1890. (R. H. 1890, p. 32, f. 9.)

C. a. glauca (bluish-green). In this variety the leaves are of a glaucous-silvery hue, being thus very distinct from the deep green of the normal form.

C. a. pendula (pendulous). A drooping form.

Other varieties are: *aurea, columnaris, pyramidalis*, and *variegata.*

C. Deodara. Other varieties are: *aurea, compacta, crassifolia* (leaves short and stout, less ornamental than the type), *Hugeli, uncinata, variegata, viridis*, and *Youngi.*

C. Libani decidua (deciduous). This only differs from the type in partially shedding its leaves during autumn.

C. L. pendula (pendulous). A variety with gracefully pendent branches. Other varieties are: *denudata, fastigiata, glauca, pendula, hybrida, pyramidata, stricta*, and *viridis.*

CEIBA. A synonym of **Eriodendron** (which *see*).

CELANDINE POPPY. *See* **Stylophorum diphyllum.**

CELANDINE, TREE. *See* **Bocconia frutescens.**

CELASTRUS. Including *Orixa*. This genus embraces about fifteen species, natives of tropical Asia, China, Japan, Australia, and North America. To those described on p. 287, Vol. I., the following should be added:

C. articulatus (jointed). *fl.* green, with yellow anthers, about ⅛in. broad, in short, axillary, few-flowered cymes. June. *fr.*, capsule pea-like, brown, three-valved; valves golden-yellow within, at length reflexed, exposing the seeds in a shining, scarlet aril; November. *l.* petiolate, 3in. to 5in. long, oblong-oval or sub-orbicular, acute; petioles ¼in. to ½in. long. *h.* 15ft. Eastern Asia, 1891. A rambling, hardy shrub, suitable for the seaside. (B. M. 7599; G. C. 1898, i., p. 28, f. 11.)

C. cassinoides. The correct name is *Gymnosporia cassinoides*.

C. Orixa (Orixa). *fl.* green, small; males racemose; females long-stalked, generally solitary. Summer. *l.* elliptic or obovate, with entire margins; upper surface glossy-green. *h.* 6ft. to 9ft. Japan, 1836. SYN. *Orixa japonica* (R. G. 1232).

C. Pyracanthus (Pyracanthus). A synonym of *Putterlickia Pyracantha*.

FIG. 223. CEDRUS ATLANTICA.

CELERY. If required for exhibition, this vegetable should receive copious supplies of weak liquid manure, with an occasional application of nitrate of soda (1oz. in 4galls. of water is sufficient). To ensure nicely-blanched growth most exhibitors wrap the plants in double or treble folds of stout brown paper.

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FIG. 224. CELERY FLY (*Tephritis onopordinis*).

1, Fly, magnified; 2, Larva, magnified; 3, Pupa, natural size.

Sorts. White varieties are usually deficient in flavour, and are only useful when the vegetable is required early or for soups. The best flavoured are Sutton's White Gem, Sandringham White, and Incomparable Dwarf White. The pink or red varieties are crisp in flavour, and also keep longer and sounder than the white sorts. Some of the best sorts are Leicester Red, Major Clarke Red, Williams's Matchless Red, Wright's Grove Red and Wright's Grove Pink, Standard-Bearer, Nonsuch Pink, and Sulham Prize Pink. These are all hardy varieties of good quality. None of the so-called self-blanching varieties are what their name indicates, and few, if any, gardeners consider them worth growing.

CELERY FLY (*Tephritis onopordinis*). Popularly this is associated with the Celery only, but it is equally as destructive to Parsnips (on whose foliage the large blisters caused by the leaf-mining pests are very familiar). The fly (Fig. 224) is ½in. in wing expanse, and yellowish brown, with rusty-coloured spots. The female deposits the eggs upon the foliage, and from these hatch out thick-bodied, legless, green maggots, slightly pointed at the head, and when full-grown about ¼in. long. There are two or three broods in a season.

As stated in Vol. I., the best way of dealing with the pest in the case of small gardens is by crushing the grub between finger and thumb; but where large areas are under cultivation this is impossible. Spraying with weak kerosene emulsion should then be adopted. In either case all leaves should be destroyed by burning when the crop is lifted, and not put on the manure-heap. Quicklime should also be incorporated with the soil.

CELERY STEM FLY. This insect, described in Vol. III. under its scientific name of *Piophila apii*, proves very troublesome in some seasons, the maggots tunnelling the stems and causing them to rot. There is more than one generation, and though in the earliest the pupal state is passed in the soil, as suggested in the volume above referred to, in the later ones it is assumed in the soil.

Feeding as it does in the stems, the pest cannot well be reached. Spraying with kerosene emulsion as a preventive measure is, however desirable, and especially in gardens where the insect was known to exist the previous season. All diseased portions of plants should be carefully burnt, and after

Celery Stem Fly—*continued.*

the crop has been lifted the quarters should receive a dressing of quicklime, which should be well incorporated. Dusting with soot has also proved beneficial.

CELMISIA (so called after Celmisius, who was said to be the son of the nymph Alciope, from whom the name of a nearly-related genus is derived). ORD. *Compositæ*. A genus embracing about twenty-five species of greenhouse or hardy, more or less silvery-silky, Aster-like, perennial herbs; one inhabits the Auckland and Campbell Islands, the rest are natives of New Zealand, one being also found in Australia. Flower-heads heterogamous, large, radiate; involucre broadly campanulate or hemispherical, the bracts many-seriate, imbricate; scapes (or scape-like peduncles) one-headed. Leaves all radical, rosulate, simple, entire or toothed, frequently covered with appressed, white or buff tomentum. Four species have been introduced. For culture, *see* **Olearia.**

C. coriacea (leathery). *fl.-heads* 1½in. to 3in. in diameter; ray florets white, excessively numerous; disk yellow; scapes very stout, cobwebby and cottony. *l.* 10in. to 18in. long, ½in. to 2½in. broad, lanceolate, coriaceous, narrowed into broad, woolly sheaths, covered above with cottony hairs, below with dense white-silvery tomentum. New Zealand. Hardy. SYN. *Aster coriacea.*

C. Lindsayi (Lindsay's). *fl.-heads* 1in. to 2in. in diameter; ray florets thirty to forty, white, three-toothed at apex; disk yellow. *l.* 2in. to 4in. long, oblong-lanceolate, obtuse, very coriaceous, dark shining green above, white beneath. Stems densely tufted, 3in. to 6in. long. New Zealand, 1890. Hardy, but requires protection from damp. (B. M. 7134.)

C. Munroi (Munro's). *fl.-heads* 1in to 1½in. across; ray florets white; disk golden-yellow; scape longer than the leaves, stout. Stem short, crowned with a thick mass of erect and recurved, linear-lanceolate leaves 3in. to 5in. long and ¼in. to ⅜in. broad. New Zealand, 1896. Whole plant, except the upper surface of the leaves and florets, clothed with snow-white, appressed wool. Greenhouse. (B. M. 7496.)

C. spectabilis (remarkable). *fl.-heads* 2in. in diameter; ray florets white or pale lilac, very numerous, revolute; disk yellow, scapes several, stout, stiff, erect, longer than the leaves. May. *l.* numerous, strict, erect, usually 5in. to 7in. long, ½in. to 1in. broad, thickly coriaceous, ensiform, elliptic-lanceolate, or linear-oblong, narrowed at base, then dilating into broad, tumid sheaths 2in. to 4in. long. Rootstock woody. Mountains of New Zealand, 1882. Hardy. (B. M. 6653.)

CELOSIA. SYNS. *Lophoxera, Sukana.* About thirty species, natives of the warmer parts of Asia, Africa, and America, are comprised in this genus. To the information given on pp. 289-90, Vol. I., the following should be added. Giant Empress, brilliant purple combs; and Vesuvius, with golden yellow combs and the upper part bright red, are two showy varieties.

C. margaritacea (pearly-white). A synonym of *C. argentea.*

C. pyramidalis. Sir J. D. Hooker regards this as synonymous with *C. cristata.*

CELSIA. Including *Ianthe.* This genus embraces about thirty species, natives of South Europe, North Africa, Abyssinia, Western Asia, and India. To the species, &c., described on p. 290, Vol. I., the following variety should be added. *See also* **Alonsoa.**

C. Arcturus Linnæana (Linnæus'). *fl.* yellow, with a purplish throat. SYN. *C. sublunata* (B. R. 438).

C. sublunata (partly woolly). A synonym of *C. Arcturus Linnæana.*

CELTIDEÆ. A tribe of **Urticaceæ** (which *see*).

CELTIS. This genus embraces about fifty species, broadly distributed over tropical and temperate regions. To those described on p. 290, Vol. I., the following should be added:

C. orientalis (Eastern). A synonym of *C. Tournefortii.*

C. reticulata (netted). *l.* obliquely cordate-ovate, acuminate, acute, or obtuse, more or less oblique at base, very rough above, and very strongly reticulate-veined beneath. Texas, 1890.

CENARRHENES (from *kenos*, empty, and *arrhen*, a male; in reference to the stamen-like glands). ORD. *Proteaceæ.* A monotypic genus. The species, *C. nitida*, is a greenhouse shrub or tree, native of Tasmania. It has small flowers in axillary or terminal spikes, and alternate, toothed leaves 3in. to 6in. long. It has been introduced, but is not in general cultivation.

CENIA (from *kenos*, empty; in allusion to the bladder-like apex of the peduncle). SYN. *Lancisia.* ORD. *Compositæ.* A genus embracing about eight species of small, hairy, greenhouse or hardy annuals or perennials, natives of South Africa. *C. turbinata* (SYN. *C. pruinosa*) has been introduced, but it is not of much horticultural value (R. H. 1892, f. 36).

CENTAUREA. Star Thistle. Including *Cyanus* and *Plectocephalus.* Most of the species of this large genus are found in the Old World, only about three being American. Leaves radical or alternate, entire, or often toothed, cut, or once or twice-pinnatisect. To the species described on pp. 290-2, Vol. I., the following should be added:

C. Amberboï (Amberbo's). A synonym of *C. suaveolens.*

C. argentea (silvery). *fl.-heads* pale yellow; involucral scales pectinate-ciliated at apex. July. *l.* silvery-tomentose, petiolate, pinnatisect, Fern-like. Stems sub-erect. Crete, 1739. Half-hardy perennial, very effective when plunged in pots in bedding arrangements.

C. Clementei (Clemente's). *fl.-heads* yellow, of no beauty. Summer. *l.* all silvery-grey; radical ones pinnatipartite, with ovate-triangular, sub-aristate lobes; cauline ones few, sessile Stems erect, branched. *h.* 3ft. Spain, 1871. Hardy perennial.

C. gymnocarpa (naked-fruited). *fl.-heads* pink or purple. August. *l.* petiolate, elegantly cut, clothed with whitish, satin-like down. Stems branching, bushy, hard. *h.* 1½ft. South Europe, 1858. Half-hardy under-shrub.

C. Jacea (Jacea). *fl.-heads* purple or rarely white; involucre ovate-globose, the outer scales having a ciliated appendix. Summer. *l.*, radical ones somewhat toothed; cauline ones lanceolate, entire. Stems erect, branched. *h.* 1½ft. to 2ft. Central Europe. Hardy perennial.

C. Margarita (Margaret's). A synonym of *C. odorata alba.*

C. odorata alba (white) A variety with white, sweet-scented flower-heads and of dwarf habit. 1893. SYN. *C. Margarita.*

C. orientalis (Oriental). *fl.*-heads straw-yellow; involucre sub-globose, the scales pale or fuscous, long-pectinate-ciliated. Summer. *l.*, lower ones petiolate, pinnatipartite, the lobes linear-lanceolate and often pinnatifid; upper ones pinnatifid or lanceolate, obtusely mucronate. Stems erect, branched. *h.* 2ft. to 3ft. Siberia, 1759. Hardy perennial, very floriferous.

C. phrygia (Phrygian). *fl.*-heads reddish-violet, sub-globose, sessile amongst the uppermost leaves; involucral scales black, scariose. July and August. *l.* oblong, acuminate, scabrous, undivided, entire or mucronate-toothed; lower ones petiolate; uppermost ones sessile, almost eared. Stem erect, simple, pilose-scabrous. *h.* 2ft. Switzerland, 1633. Hardy perennial.

C. rutifolia (Rue-leaved). *fl.*-heads at first pale flesh-coloured, afterwards reddish; involucral scales ciliated, sulcate, spiny-mucronate. Summer. *l.* 6in. to 8in. long, snowy-tomentose, interruptedly bipinnatisect; uppermost ones spathulate. Bulgaria. Hardy perennial.

CENTAURIDUM. A synonym of **Xanthisma** (which *see*).

CENTIPEDES. These animals may be considered of benefit to gardeners. *See* **Myriapoda.**

CENTRADENIA. This genus embraces about five species, natives of Central America. To those described on p. 292, Vol. I., the following should be added:

C. floribunda (abundant-flowered). *fl.* of a lilac-rose colour, disposed in terminal panicles. *l.* ovate, entire, slightly oblique, reddish on the nerves beneath. Stems red. Guatemala. (F. d. S. 453.)

C. inæquilateralis (unequal-sided). The correct name of *C. rosea.*

C. ovata (ovate). *fl.* pink; petals obovate; cymes terminal, trichotomous, many-flowered. *l.*, three-nerved, petiolate, ovate, acute, glabrous, shining, pale beneath. Stems and branches erecto-patent. Central America, 1861.

CENTRANTHERA. Included under **Pleurothallis** (which *see*).

CENTRANTHUS. SYN. *Kentranthus.* About eight species, natives of the Mediterranean region, are comprised in this genus.

CENTRATHERUM (from *kentron*, a spur, and *ather*, an awn; the pappus consists of stiff awns). SYNS. *Ampherephis, Amphibesis, Crantzia, Spixia.* ORD. *Compositæ.* A small American genus (five or six species) of stove or greenhouse, diffuse, branched or rarely erect herbs, of which two have spread over the warmer parts

Centratherum—*continued.*

of the world. Flower-heads usually purple, on terminal or leaf-opposed peduncles. Leaves alternate, petiolate. *C. intermedium* (SYN. *Ampherephis intermedia*, S. B. F. G. 225) and *C. punctatum* (SYN. *Ampherephis aristata*) have been introduced, but are probably lost to cultivation.

CENTRIFUGAL. A term applied to an inflorescence of which the terminal flower blossoms earliest. Opposed to a Centripetal one, in which the lower or outer flowers are the first to expand.

CENTROCARPHA. Included under **Rudbeckia** (which *see*).

CENTROCLINIUM. Included under **Onoseris** (which *see*).

CENTROLEPIDEÆ. A natural order embracing about thirty species of very small herbs, nearly all Australian, and allied to the *Restiaceæ*; they are of botanical interest only.

CENTRONIA. SYN. *Calyptraria.* Flowers purple, large, disposed in large, terminal panicles; calyx furfuraceous or hairy; petals five to seven; stamens ten. Leaves ample, petiolate, entire or toothed.

CENTROPETALUM (from *kentron*, a spur, and *petalon*, a petal; in allusion to the spur-like appendage at the base of the labellum). Including *Nasonia.* ORD. *Orchideæ.* A small genus (five or six species) of dwarf, creeping, cool-house Orchids, natives of the Colombian Andes. Flowers mediocre, solitary in the upper axils; sepals sub-equal, spreading, free, or the lateral ones more or less connate; petals similar or broader; lip connate towards the base with the column, at length erect, the lateral lobes scarcely prominent or broader and embracing the column, the lamina spreading, ovate or broadly rounded, undivided. Leaves distichous, short. *C. punctatum* (described on p. 421, Vol. II., as *Nasonia punctata*) is the best-known species.

CENTROPOGON. This genus embraces upwards of eighty species of shrubs or under-shrubs, natives of the warmer parts of America and the West Indies. Flowers solitary, axillary, pedunculate, rarely disposed in a terminal, elongated raceme; calyx lobes leaf-like or reduced to mere teeth; corolla curved, the tube entire or with a short dorsal cut, the limb incurved, with nearly equal lobes. Leaves alternate, toothed or rarely dissected. To the species described on p. 293, Vol. I., the following should be added:

C. tovarensis (Tovar). *fl.* bright carmine, with a very long style, disposed in a terminal raceme. Winter. *l.* ovate-lanceolate. Stems somewhat woody. Venezuela.

CENTROSEMA (from *kentron*, a spur, and *sema*, a standard; the standard has a short spur behind). ORD. *Leguminosæ.* A genus embracing about twenty-six species of twining or prostrate, stove or greenhouse herbs or under-shrubs, mostly natives of Central or South America, and closely allied to *Clitoria.* Flowers white, violet, rose-coloured, or bluish, showy; standard broadly orbicular, with a short spur behind; wings falcate; keel broad, incurved, scarcely shorter than the wings; peduncles axillary, solitary or twin. Leaves pinnately three- to seven-foliolate, rarely one-foliolate or sub-digitately three- to five-foliolate. For culture of the few species introduced, *see* **Clitoria.**

C. brasilianum (Brazilian) The correct name of *Clitoria brasiliana.*

C. grandiflorum (large flowered). *fl.* of a beautiful lilac-rose, large and numerous. Brazil, about 1893.

C. virginianum (Virginian). *fl.* violet, 1in. long, pubescent outside; peduncles one- to four-flowered. July. *l.* trifoliolate; leaflets varying from oblong-ovate to linear, thin but firm, scabrous-pubescent. Stem very slender, twining. Florida, &c., 1732. Greenhouse. SYN. *Clitoria virginiana* (B. M. 1047).

CENTROSIS. A synonym of **Calanthe** (which *see*).

CENTROSTEMMA. Included under **Hoya** (which *see*).

CEODES. A synonym of **Pisonia** (which *see*).

CEPHAELIS. SYNS. *Callicocca, Carapichea, Cephaleis, Eurhòtia, Evea, Tapogomea.* As many as seventy species are included hereunder. *C. Bearii*, introduced in 1888, is a stove shrub, of no great beauty, with inconspicuous umbels of flowers.

CEPHALANDRA (from *kephale*, a head, and *aner, andros*, a male; the anthers are connate or coherent in a head). SYN. *Coccinia.* ORD. *Cucurbitaceæ.* A genus embracing twelve or fourteen species of stove or greenhouse, slender, prostrate, or climbing, glaucous or scabrid, usually tuberous-rooted herbs, natives of tropical Asia and tropical and South Africa. Flowers white or yellow, usually dicœcious; males solitary or sub-cymose at the apex of a slender peduncle; females solitary. Fruits cylindric or oblong, rather small, very fleshy. Leaves angled or lobed, sometimes glandular. Tendrils undivided. Two of the species have been introduced, but probably *C. quinqueloba* (B. M. 1820 and B. R. 82, under name of *Bryonia quinqueloba*) is no longer grown. For culture of the two species here described, *see* **Bryonia.**

C. indica (Indian). *fl.* whitish-yellow, 1in. long, all solitary; male peduncles 1in. long; females ¼in. long. *fr.* carmine-red, ovoid, 1in. to 2in. long. *l.* five-angular or occasionally five-lobed, 2in. to 4in. in diameter, papillose, scabrid; petioles 1in. long. Stem much-branched, angular, and grooved. India, Upper Guinea, &c., 1894. Stove. SYN. *Coccinia Moghadd.*

C. palmata (palmate). *fl.* yellow; male peduncles elongated, racemose; females shorter, racemose. April. *fr.* scarlet, marbled with white, as large as a pigeon's egg. *l.* palmately five-lobed, 3in. to 4in. long and broad; lobes ovate, acuminate; petioles 1½in. to 2in. long; rootstock very large. Natal, 1893. Greenhouse.

CEPHALANTHUS. This genus includes half-a-dozen species of erect shrubs or small trees, natives of Asia, America, and South Africa. Flowers yellow, in globose, compact, terminal and axillary heads, bractless. Leaves opposite and in whorls of three or four, shortly petiolate, oblong- or ovate-lanceolate; stipules short. To the species described on p. 293, Vol. I., the following should be added:

C. natalensis (Natal). *fl.* very numerous, in globose, terminal, peduncled heads 1in. to 1½in. in diameter; corolla-tube rose-red, the lobes green. Spring. *l.* about 1in. long, ovate, acuminate or obtuse, glabrous and shining above, pale beneath. South-east Africa, 1886. A small, much-branched, greenhouse shrub. (B. M. 7400.)

C. occidentalis angustifolius (narrow-leaved). A variety having lanceolate leaves, narrower than in the type. 1889. (R. H. 1889, p. 231, f. 71.)

C. o. brachypodus (short-footed). A variety having shortly-stalked leaves, usually in whorls of three.

CEPHALARIA. SYNS. *Lepicephalus, Succisa.* This genus includes about two dozen species, natives of Europe, Western Asia, North Africa, and Abyssinia. To those described on p. 294, Vol. I., the following should be added:

C. alpina (Alpine). *fl.-heads* pale yellow, terminal on the branchlets; involucral teeth eight, aristate, equalling the florets. June and July. *l.* pinnatisect, pubescent; segments lanceolate, decurrent, unequally serrated. Stems striated, somewhat velvety. *h.* 5ft. Alps and Greece. SYN. *Scabiosa alpina.*

CEPHALEIS. A synonym of **Cephaelis** (which *see*).

CEPHALINA. A synonym of **Sarcocephalus** (which *see*).

CEPHALOID. Head-shaped, or growing in a head.

CEPHALOMENES. *See* **Trichomanes.**

CEPHALOTAXUS. Chinese Yew. Four species are referred to this genus by Bentham and Hooker, three being Japanese and the other Chinese. To those described on p. 294, Vol. I., the following should be added:

C. Fortuni [not *Fortunei*] is a form of *C. drupacea.* The following are sub-varieties: *brevifolia* (short-leaved) and *longifolia* (long-leaved).

Cephalotaxus—*continued.*

C. Mannii (Mann's). *l.* linear, acuminate, 2in. long, ⅛in. to ¼in. broad, sub-falcate, shining above, paler beneath. *male heads* globose, on scaly peduncles; *female cones* three or four on a common peduncle, pedicillate. China, Khasia Mountains, &c. A small tree.

FIG. 225. CEPHALOTAXUS PEDUNCULATA FASTIGIATA.

C. pedunculata fastigiata. This distinct variety grows about 8ft. high, and is of bushy, pyramidal habit. See Fig. 225.

C. tardiva (late). A synonym of *Taxus baccata adpressa.*

C. umbraculifera (umbrella-bearing). A synonym of *Torreya grandis.*

CERADIA. Included under **Othonna** (which *see*).

CERAIA. A synonym of **Dendrobium** (which *see*).

CERAMBYCIDÆ. *See* **Beetles.**

CERASEIDOS. Included under **Prunus** (which *see*).

CERASTIUM. More than 100 widely-distributed species have been referred to this genus, but not more than forty are distinct as such. Flowers in terminal, dichotomous cymes; sepals five, rarely four; petals the same number, usually emarginate or bifid; stamens ten or more. Leaves variable, but rarely subulate. To the species described on pp. 294-5, Vol. I., the following should be added:

C. argenteum (silvery). A synonym of *C. tomentosum.*

C. decalvans (bald). A form of *C. tomentosum.*

C. tomentosum decalvans (bald). *fl.* white, numerous. May and June. *l.* covered with tufts of wool. Stems somewhat woody. Servia, 1892.

CERASUS. Including *Laurocerasus.* Bentham and Hooker include this genus under **Prunus** (which *see*). To the species described on pp. 295-7, Vol. I., the following should be added:

C. acida (acid). Montmorency Cherry. *fl.* white; umbels aggregate, sparse, sessile. April and May. *fr.* red or dark purple; juice colourless. *l.* flat, glabrous, shining, sub-coriaceous, elliptic, all acuminate; petioles glandless. Orient, &c.

C. a. pyramidalis (pyramidal). A garden variety, with erect branches, forming a pyramidal growth like that of the Lombardy Poplar.

C. Avium. In addition to the variety *mutiplex*, the following may be mentioned: *flore-pleno*, flowers double, pink in the centre, a fine variety; *pendula*, branches reflexed at the extremity; and *salicifolia* (SYN. *longifolia*), leaves elongated.

C. Capuli. Capollin or Capulinos of Mexico. *fl.* white, in terminal racemes similar to those of *C. Padus.* *fr.* red, pulpy, resembling small Cherries. *l.* oblong or elliptic-oblong, acute, finely toothed, glaucous-green beneath. Mexico, 1883. Shrub or small tree. (R. H. 1888, p. 137, f. 50, under name of *Prunus Capuli.*)

C. Chicasa. Chicasaw Plum. *fl.* white; umbels two- or three-flowered, the short pedicels and calyx glabrous. April. *fr.* red or yellowish-red, globose, ½in. or more in diameter, of a pleasant flavour. *l.* oblong-lanceolate or oblanceolate, acute, serrulated, nearly glabrous. Branches thorny. North America, 1806.

C. humilis (dwarf). A synonym of *Prunus Jacquemontii.*

C. japonica (Japanese). A synonym of *Prunus sinensis.*

C. Juliana pendula (drooping). A garden form, with pendulous branches. 1890.

C. Laurocerasus schipkaensis (Schipka Pass). An especially hardy form, from the Northern slopes of the Balkan Mountains. 1890.

C. Selzeri (Selzer's). A species of the *Padus* group, with yellowish-white fruit, and said to come true from seed. Carinthia and Styria, 1892.

C. serotina cartilaginea (cartilaginous). A garden variety having long, smooth, coriaceous leaves, resembling those of the Cherry Laurel. 1889.

C. s. pendula (pendulous). A weeping variety.

C. vulgaris (common). A synonym of *C. Caproniana.*

CERATOCAULOS. Included under **Datura** (which *see*), the correct name of *C. daturoides* being *Datura ceratocaula.*

CERATOCEPHALUS. Included under **Ranunculus** (which *see*).

CERATOCHILUS (of Blume). Included under **Saccolabium** (which *see*).

CERATOCHILUS (of Lindley). A synonym of **Stanhopea** (which *see*).

CERATOGYNUM. A synonym of **Sauropus** (which *see*).

CERATOLOBUS. Two or three species are included in this genus. Flowers polygamo-monœcious, usually twin, the lower ones sessile and hermaphrodite, the upper ones stipitate, male or neuter, bracteate; spadix 4in. to 6in. long, loosely paniculate; spathe solitary, pod-like, complete, linear-oblong, ancipitous. Fruit globose or ellipsoid, one-celled, one-seeded. Leaves alternate, equally pinnatisect; rachis prickly. **C. Findlayanus** is in the Kew Collection, but is not in general cultivation. *See also* **Korthalsia.**

C. Micholitziana (Micholitz'). A synonym of **Bacularia Micholitziana** (which *see*).

CERATONEON EXTENSUM. *See* **Tilia—Insects.**

CERATOPHYLLEÆ. A very small natural order (one or two species) of widely-dispersed, aquatic herbs, ranking between *Empetraceæ* and *Gnetaceæ*; they are of botanical interest only.

CERATOPTERIS. Eaton, in his excellent work on North American Ferns, says *C. thalictroides* "is an annual, growing from the spore, forming its prothallus with the antheridia and archegonia producing its embryo, and growing first into a plantlet with minute, obovate fronds, and soon into a mature plant, buoyed up by the spongy leaf-stalks of its fronds, and later on sending up into the air fully-developed sterile and fertile fronds, and at last dying and contributing its proportion of decaying vegetable matter to its native lagoons." In a cultivated state the spores must be preserved; they require to be sown early in the spring, in some very moist loam, where they will germinate and grow freely. When sufficiently strong, the seedlings should be plunged into the water so that the little crowns are quite covered. The plant may also be increased by pegging on to the surface of moist soil the numerous bulbils with which its barren fronds are quite covered, and which soon produce a crop of young plants of rapid growth. It succeeds best when the pot containing it is plunged to the rim in water of a uniform temperature of from 60deg. to 65deg.

CERATOSANTHES (from *keras, keratos*, a horn, and *anthos*, a flower; in allusion to the shape of the blossoms). ORD. *Cucurbitaceæ*. A small genus (two or three species) of slender, climbing, stove herbs, with large, tuberous roots, natives of the warmer parts of America and the West Indies. Flowers racemose. Leaves palmately lobed. *C. tuberosa* (B. M. 2703) has been introduced, but is probably no longer in cultivation.

CERATOSPERMUM (of Persoon). A synonym of **Eurotia** (which *see*).

CERATOSTEMA. The plant described on p. 80, Vol. II., as **Gonocalyx pulcher** is probably a species of this genus.

CERATOSTIGMA (from *keras, keratos*, a horn, and *stigma*, a stigma; alluding to the stigmas being beset with short, horn-like excrescences). SYN. *Valoradia*. ORD. *Plumbagineæ*. A small genus (three or four species) of greenhouse or hardy, perennial herbs or shrubs; one is Chinese, another Himalayan, and one or two are Abyssinian. Flowers densely capitate-spicate at the tips of the branches; calyx tubular, glandless, deeply five-cleft, the lobes narrow; corolla salver-shaped, the tube long and slender, the limb of five obtuse or retuse, spreading lobes. Leaves alternate, obovate or lanceolate, more or less setose-ciliated. Only one species calls for mention here. It thrives in ordinary garden soil, and may be increased by divisions.

C. plumbaginoides (Plumbago-like). The correct name of the plant described on p. 169, Vol. III., as *Plumbago Larpentæ* (F. d. S. 307). SYN. *Valoradia plumbaginoides* (B. M. 4487).

CERATOTHECA (from *keras, keratos*, a horn, and *theke*, a case, a capsule; in allusion to the horned fruit). SYN. *Sporledera*. ORD. *Pedalineæ*. A small genus (two species) of erect, pubescent, stove or greenhouse (? always) annual herbs, natives of tropical and South Africa. Flowers solitary in the axils, shortly pedicellate: calyx five-parted or deeply five-cleft; corolla tube enlarged above, the limb sub-bilabiate, with spreading lobes; stamens four, didynamous. Leaves opposite, or the upper ones alternate, ovate, toothed. *C. triloba*, the only species in cultivation, is probably a biennial. Seeds should be raised in heat, and the plants, when strong enough, removed to the greenhouse. Rich loam, a sunny position, and plenty of water when growing, are essentials to success.

C. triloba (three-lobed). *fl.* in opposite pairs, shortly pedicellate, with a minute, imperfect flower at the base of each; calyx erect; corolla pale violet-purple, with darker streaks, 3in. long, pilose. September. *l.* polymorphous, the lower ones long-petiolate, varying from broadly ovate-cordate to broadly triangular and three-lobed, crenate, the broadest leaves 8in. across; floral ones narrowly ovate, shorter than the flowers. Stem 5ft. high. Natal, 1886. (B. M. 6974; G. C. 1887, ii., p. 492.)

CERATOZAMIA. SYN. *Dipsacozamia*. The half-dozen species comprised in this genus are only found in Mexico.

CERBERA. *Tanghinia* (described on p. 8, Vol. IV.) is included hereunder by Bentham and Hooker. The genus includes about four species, natives of Madagascar, tropical Asia, and the Pacific Islands; several others formerly classed under *Cerbera* being now referred to **Kopsia, Ochrosia, Tabernæmontana,** and **Thevetia.**

C. Tanghin (the native name). The correct name of *Tanghinia venenifera*.

CERCIDIPHYLLUM (derivation not explained). ORD. *Magnoliaceæ*. A monotypic genus. The species, *C. japonicum*, is a tree or shrub, which proves hardy on walls in our more Southern districts. It thrives in any fairly good soil, and may be increased by seeds or by layers. At present it is rare in cultivation.

CERCIS. To the species described on p. 298, Vol. I., the following should be added:

C. occidentalis (Western). *fr.*, pods oblong, very obtuse, shortly apiculate at apex, scarcely stipitate. *l.* almost reniform, very obtuse. *h.* 15ft. Texas. Shrub.

CERCOCARPUS. Five species, natives of California and Mexico, are referred to this genus. Flowers sessile, shortly pedicellate, solitary or fascicled, axillary or terminal; calyx tube persistent, pedicel-like, the limb deciduous, five-lobed; petals wanting; stamens fifteen to twenty-five. Leaves alternate, petiolate, simple, entire or serrated, straight-nerved. To the species described on p. 298, Vol. I., the following should be added:

C. betulifolius (Birch-leaved). A synonym of *C. parvifolius glaber*.

C. parvifolius (small-leaved). *fl.* solitary or in pairs, on short pedicels, recurved. June. *fr.* having a very long, densely plumose tail. *l.* scarcely 1in. long, cuneiform-obovate, silky-pubescent or at length nearly glabrous above, tomentose-canescent beneath, toothed towards the apex. Rocky Mountains, 1881. A low, half-hardy shrub.

C. p. glaber (glabrous). *fl.* two to six in a fascicle. April *l.* about 2in. long, nearly glabrous above. California, 1885. About twice as large as the type. SYN. *C. betulifolius*.

CERCOSPORA. A genus of very destructive fungi, several species of which are common in Europe and in America. The genus is chiefly characterised by olive-coloured, worm-like septate conidia. All the more important species have been briefly described and treated under the various plants affected. For instance, *C. circumscissa* is dealt with under **Peach Fungi,** Vol. III.; it is, however, not entirely confined to the Peach, being found upon the Apricot, Cherry, Nectarine, and the Almond. In those countries, too, where the last-named is extensively grown, the trees suffer considerably owing to their premature defoliation. Allusion has already been made to the pale spots which form upon the foliage. After a time, however, the diseased portions frequently collapse, leaving holes, which has gained for the disease the common name of Shot-Hole Fungus.

Another very common species in America is *C. apii*, which causes the Leaf-Spot or Leaf-Blight of Celery. In this disease the leaves are first noticed to bear small, greenish-yellow spots, which gradually increase in size and change to brown. Eventually the leaves assume a most unhealthy look, and fall.

C. Bloxami is found in this country upon Turnips and other *Cruciferæ*. *C. beticola* is responsible for the Leaf Spot of Beet so common in the United States; *C. lilacis* for a disease of Lilac (*Syringa*); and *C. angulata* for the Leaf-Spot of Currant.

From very careful experiments in the case of the species affecting Celery and the Peach, the best way of controlling the disease is to spray early in the season with a solution of Ammoniacal Carbonate of Copper (*see* **Fungicides**); while for the Beet a weak solution of Bordeaux Mixture may be tried in early summer as in the other cases. All infected leaves, fruits, and shoots should be burned.

CEREUS. About 200 species of this genus are known, natives of tropical and sub-tropical America, the West Indies, and the Galapagos Islands. (*See also* **Echinopsis** and **Pilocereus,** which are included under *Cereus* by the authors of the "Genera Plantarum.")

For cultural purposes this large genus may be divided into Night-Flowering, Semi-Scandent, and Globose or Columnar-stemmed species.

NIGHT-FLOWERING SPECIES. The most interesting group is that of the climbing night-flowering kinds, on account of their singular habit of expanding their flowers in the dark, and of the very large size and brilliant colours of their flowers. In habit the plants of this set are trailers or climbers; their stems are either round or angled, and grow to a length of many feet, branching freely as they extend. By means of their roots, which are freely formed upon the stems, and which have the power of attaching themselves to stones or wood in the same way as Ivy does, these kinds soon spread over and cover a large space; they are, therefore, useful for training over the back walls in lean-to houses, or for growing against rafters or pillars—in fact, in any position exposed to bright sunlight and where there is a good circulation of air. Soil does not appear to play an important part with these plants, as they will grow anywhere where there is a little brick rubble, gravel, or cinders for their basal roots to nestle in. They have been grown in the greatest luxuriance, and have produced flowers in abundance with nothing more than their roots buried in the crumbling foundations of an old wall, upon which the stems were clinging. The chief consideration is drainage, as, unless the roots are kept clear of anything like stagnation, they soon perish through rot. During the summer the stems should be syringed morning and evening on all bright days, whilst in winter little or no water will be required.

Like all other Cactuses, these plants may be propagated by means of large branches, which, if placed in a porous soil, will strike root in a few weeks.

SEMI-SCANDENT SPECIES. These are characterised by a thin, drooping or trailing stem, and, though not strictly climbers, they may most fittingly be considered in a group by themselves. Some botanists have made a separate genus for them, viz., *Cleistocactus*, but for all practical purposes they may be grouped under the above heading, whilst popularly they are known as the Rat's-tail or Whipcord Cactuses. Two of them—viz., *C. flagelliformis* and *C. Mallisoni*—are generally grafted on the stem of some erect, slender Cereus or Pereskia; or they may be worked on to the stem of a climbing Cereus, such as *C. triangularis*, in such a way as to hang from the roof of a house. A large specimen of *C. flagelliformis*, growing from the climbing stem of *C. rostratus*, was, for a long time, conspicuous among the Cactuses at Kew, but, owing to the decay of the "stock" plant, this fine specimen no longer exists. A large Pereskia, trained along the roof in the Cactus-house at Kew, was grafted with a number of pieces of *C. flagelliformis*. In the same establishment a specimen of *C. Mallisoni* was grafted on the stem of another kind, and is very attractive when in flower. *C. serpentinus* thrives well upon its own roots. For the cultivation of this little group, the instructions given for the climbing and other kinds may be followed.

GLOBOSE AND COLUMNAR-STEMMED SPECIES. Many of these are unsuited for culture in ordinary plant-houses, whilst others are so rare that, although cultivated in botanical collections, they are not available for ordinary gardens, not being known in the trade. There are, however, a good many species that may be obtained from dealers in Cactuses, and to these we shall confine ourselves here. At Kew, the collection of Cereuses is large and diversified, some of the specimens being as tall as the house they are in will allow them to be, and the appearance they present is, to some eyes at least, a very attractive one. Such plants are: *C. candicans*, which is a cluster-stemmed kind, very thick and fleshy, and in shape like an Indian club; *C. chiliensis*, with tall hedgehog-skinned stems, the numerous ridges being thickly clothed with clusters of yellowish spines, which become dark-brown with age; *C. Dyckii*, 10ft. high, the stems thick and fleshy, with ridges 1½in. deep; *C. gemmatus*, a hexagonal, almost naked-stemmed species 10ft. high: *C. strictus*, *C. peruvianus*, *C. geometrizans*, and *C. Jamacaru*, which are tall, weird-looking plants, 10ft. or more high, some of them freely branched.

Cereus—*continued.*

To those described on pp. 299-300, Vol. I., the following should be added:

C. aggregatus (clustered). A synonym of *C. phœniceus.*

C. Berlandieri (Berlandier's).* *fl.* 4in. across, produced on the young, upright stems; petals bright purple, strap-shaped, in an irregular ring; stamens rose-coloured, clustered. Summer. Stems procumbent, not more than 6in. long and ⅜in. thick, bearing, along the ridges, little tubercles, crowned with short spines. South Texas and Mexico. Plant dwarf, creeping, very soft and watery. See Fig. 226.

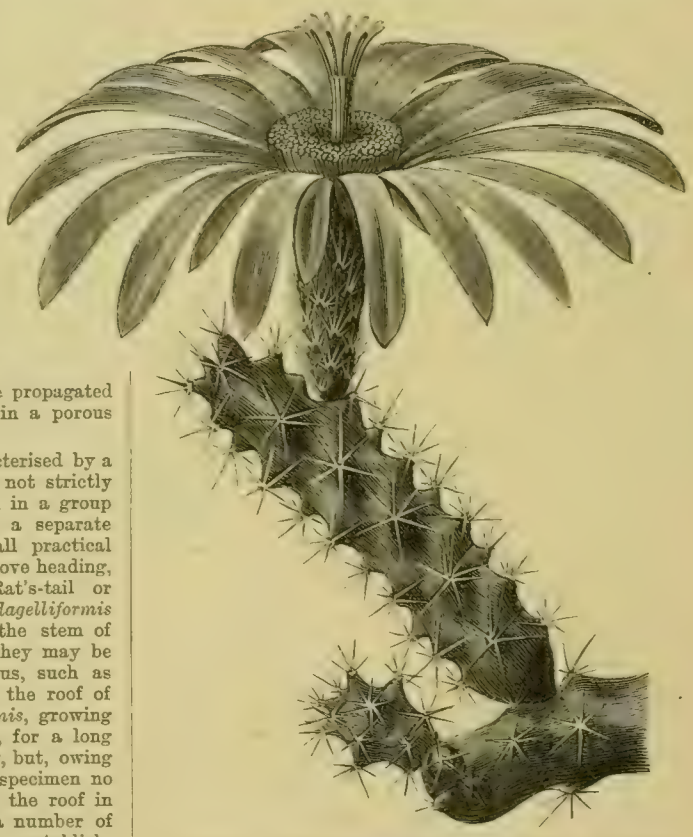

FIG. 226. PORTION OF PLANT, WITH FLOWER, OF CEREUS BERLANDIERI.

C. Blankii (Blank's). This only differs from *C. Berlandieri* in having deep rose flowers, flushed with crimson, and longer, broader, and less spreading petals. Summer. Mexico (at high elevations). See Fig. 227.

C. cærulescens (bluish). *fl.* about 8in. long, springing from the ridges; tube reddish-green; petals white, spreading, with toothed margins; stamens arranged in a sort of cup; anthers

Cereus—*continued.*

FIG. 227. PORTION OF STEM, WITH FLOWER, OF CEREUS BLANKII.

yellow. Summer. Stem erect, tall, bluish when young; ridges about eight, prominent, waved, bearing tufts of blackish wool, in which are set about a dozen black spines. Mexico, 1841. (B. M. 3922.)

C. cæspitosus (tufted). *fl.* deep rose-coloured; petals thirty to forty, oblong, acute, obtuse, or mucronate; tube having eighty to one hundred cushions clothed with long, ashy wool, and six to sixteen brown or blackish spines. Stems 4in. to 6in. high, 3in. to 4in. in diameter, simple or clustered, cylindric-ovoid, pale greyish or whitish, with scanty brown wool; ribs twelve to eighteen, ¼in. to ⅜in. broad at base; cushions close-set, with

FIG. 228. CEREUS CÆSPITOSUS.

twenty to thirty straight spines ¼in. or more in length. New Mexico and Texas, 1880. (B. M. 6669.) See Fig. 228.

C. Cavendishii (Cavendish's). A synonym of *C. Paxtonianus.*

C. Childsii (Child's). *fl.* pink, 30in. in circumference, composed of six rows of recurved petals, the numerous stamens standing well above them; opening at night. Probably a form of *C. variabilis.*

C. cirrhiferus (tendril-bearing). *fl.* bright red, nearly 4in. across, very regular, lasting about a week. Stems prostrate, branching, very proliferous, with roots along the main ones; branchlets upright, five-angled, with slightly-raised points or tubercles, upon which are ten short, hair-like spines, arranged in a star, and surrounding three or four erect central ones. Mexico, 1847. A small-growing kind.

Cereus—*continued.*

FIG. 229. CEREUS CTENOIDES.

C. ctenoides (comb-like).* *fl.* 3in. to 4in. across, produced in the ridges near the top of the stem; petals bright yellow, resembling a Convolvulus; stamens yellow; pistil white. June or July. Stem 3in. to 5in. high, about 3in. in diameter, egg-shaped, producing offsets at the base; ribs fifteen or sixteen, spiral, with closely-set cushions of whitish spines ¼in. long. Texas. Rare in cultivation. See Fig. 229.

FIG. 230. PORTION OF STEM, WITH FLOWER, OF CEREUS ENNEACANTHUS.

C. Engelmannii (Engelmann's). *fl.* purplish-carmine; sepals fifteen to twenty, ovate-lanceolate, prickly; petals acute; stigmas twelve, green, erect. *fr.* red, ovate. Stem ovate-cylindrical, eleven- to thirteen-ribbed, bearing the flowers laterally at the apex; prickles radiating, whitish, about thirteen in a tuft. California, 1885. (R. G. 1174 [1175a in text].)

Cereus—*continued.*

FIG. 231. FLOWER OF CEREUS GIGANTEUS.

C. enneacanthus (nine-spined). *fl.* freely developed on the ridges near the top of the stem; petals deep purple, spreading; tube spiny; pistil and stamens yellow. Stem seldom exceeding 6in. in height, less than 2in. in diameter, cylindrical, bright green, tufted in old specimens; ribs shallow, broad, irregular on the top, with spine cushions on the projecting parts; spines frequently twelve (although the specific name implies only nine) to a tuft. Texas. A rare plant in cultivation. See Fig. 230.

C. eruca (caterpillar-like). *fl.* yellow, 4in. to 6in. long. Stems prostrate, rarely branched, 1ft. to 3ft. long, 3in. to 5in. in diameter; ribs thirteen to twenty-one, with closely-set spine-tufts; spines stout, straight, the radial ones terete and nearly 1in. long, the central ones thicker, angled, or flattened, one wide, one in each tuft pointing downwards. California. A curious plant, creeping over any obstacle. "The manner of growth, with uplifted heads and prominent reflexed spines, gives the plant a resemblance to huge caterpillars."

FIG. 232. PORTION OF STEM, WITH FLOWER, OF CEREUS LEPTACANTHUS.

Cereus—*continued.*

C. extensus (long-stemmed). *fl.* about 9in. across, developed all along the stems, tube green, thick, 3in. long; larger scales yellow and green, tipped with red; petals white, tinted with rose. August. Stems long, rope-like, bluntly triangular, less than 1in. thick, with very short spines in pairs or threes about 1in. apart, and aërial roots. Trinidad, 1843. (B. M. 4066.)

C. Fendleri (Fendler's). *fl.* purple, sub-erect, 3in. in diameter; calyx tube and ovary bearing cushions covered with short spines; inner sepals twelve to fifteen; petals sixteen to twenty-four. June. Stem ovoid or sub-cylindric, 5in. to 7in. high, 3in. to 4in. in diameter, pale green, simple or rarely branched at base; ribs nine to twelve, ½in. deep; radial spines seven to ten, the central one 1½in. long. New Mexico, 1880. (B. M. 6533.)

C. giganteus (gigantic). *fl.* 4in. to 5in. long and wide, rarely produced in cultivation. Stems globose when young, afterwards becoming club-shaped or cylindrical, flowering when 10ft. to 12ft. high, but attaining four or five times that height. Mexico and California. The most gigantic of all Cacti, but a very slow grower, a cultivated plant, eight or ten years old, at Kew, being only 6in. high. See Fig. 231.

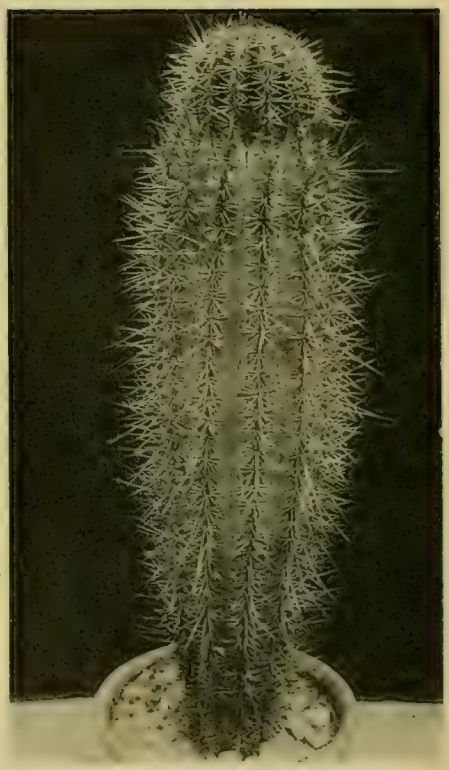

FIG. 233. CEREUS PECTEN-ABORIGINUM.

C. Hempelii (Hempel's). Stems dark green, ten-ribbed, furnished with brownish spines. Mexico, 1897. SYN. *Echinocereus Hempelii.*

C. hypogæus (underground). *fl.* 2in. long, the tube short, with a few spine-tufts; petals purplish, margined with yellow, oblong, mucronate. Aërial stems cylindric or clavate, seven- or eight-angled; tubercles with two to five or more bristle-like spines and three to five longer central ones. Underground stem minute, unarmed. Chili, 1832. (R. G. 1035.)

C. latifrons (broad-stemmed). A synonym of *Phyllocactus latifrons.*

C. Leeanus (Lee's).—*fl.* brick-red, four or five at the top of the stem; tube 2in. long, with yellowish, green-tipped scales; anthers yellow. Summer. Stems 1ft. high, 5in. in diameter at base,

Cereus—*continued.*

tapering gradually to the apex; ridges about twelve, ¼in. high, the angles sharp and clothed with clusters of pale brown spines, the central one 1in. long. Mexico, 1843. A desirable window-plant.

C. Lemairii (Lemaire's). *fl.* very fragrant; tube covered with green, crimson-edged scales; sepals not spreading star-like, tinged with crimson. June. Stem bluntly triangular; angles marked with a row of distant spines. Otherwise like *C. grandiflorus*. Antigua (?), 1854. (B. M. 4814.)

C. leptacanthus (slender-spined).* *fl.*, several to a branch; petals deep purplish-lilac in the upper half, the lower part white, forming a shallow cup, notched on the edges; stamens white; anthers and stigma orange. May and June. Mexico, 1860. Habit as in *C. Berlandieri*. See Fig. 232.

C. Mallisoni (Mallison's). *fl.* bright red, 4in. long and broad, with pale yellow stamens protruding 1in. beyond the throat, borne in abundance from the sides of the stems, lasting three or four days in beauty. Said to be a hybrid between *C. speciosissimus* and *C. flagelliformis*.

C. monstrosus (monstrous). A variety of *C. peruvianus*.

C. Napoleonis (Napoleon's). *fl.*, tube 6in. long, curved upwards, clothed with rose-tinted scales, widening into a whorl of greenish sepals; petals white, forming a shallow cup 8in. across; stamens yellow. Autumn. Stems triangular, light green, with clusters of short, stiff spines along the angles at intervals of 2in. Mexico (?), 1835. (B. M. 3458.)

C. Paxtonianus (Paxton's). *fl.* white, 3in. to 4in. across; calyx tube 2½in. long, unarmed; petals very many, in several series, incurved. September. Stem (of the Kew specimen) 4ft. high, about 1in. in diameter, erect, flexuous, branching towards the top, five- to six-angled, very lurid green, studded with spine-bearing pulvilli ¼in. apart. Brazil (?). (B. M. 7643.) SYN. *C. Cavendishii*.

C. paucispinus (few-spined). *fl.* axillary towards the top of the stem, 3in. broad; calyx sub-cylindric, with ten or fifteen clusters of short, pale spines; petals about thirty, dark red, tinged brown, elongate-spathulate, with concave tips. May. Stems 5in. to 9in.

FIG. 234. STEM, BRANCHES, BUDS, AND FLOWER OF CEREUS PROCUMBENS.

Cereus—*continued.*

high by 2in. to 4in. in diameter; ridges irregular in shape, ½in. to ¾in. in diameter; tubercles variable; spines three to seven, stout, pale red-brown. New Mexico, 1883. (B. M. 6774.)

C. Pecten-aboriginum (aboriginal comb). *fl.* white, 2in. to 3in. long. *fr.* globose, covered with yellow spines, forming balls 3in. in diameter. Trunk 1ft. in diameter. Ribs ten, purplish, clothed with closely-set tufts of hairs and about ten stout, straight spines 1in. long. *h.* 20ft. to 30ft. Sonora, 1894. See Fig. 233. The Indians use the bristly covering of the fruit as a hair-brush. (G. & F., 1894, p. 334, f. 54.)

C. pectinatus (comb-like). The correct name of *Echinocactus pectiniferus*. SYN. *C. pectiniferus*.

C. p. rigidissimus (very rigid). *fl.* bright rose-red, the lower part of the petals white. Stems 1ft. high, with reddish spines.

C. p. robustus (robust). *fl.* bright rosy, with the lower part of the segments white. *h.* 1ft. Mexico, 1890. A robust variety, growing 1ft. in height.

C. pectiniferus (tooth-bearing). A synonym of *C. pectinatus*.

C. pentalophus (five-winged). *fl.* 3in. across; petals rose-coloured, white in the centre; anthers yellow; stigma purplish-blue. Stem erect, about 1in. in diameter, ridges five, very prominent, wavy, sharp-edged, with little clusters of small spines about ½in. apart. Mexico, 1838.

C. peruvianus (Peruvian). *fl.* white within, reddish outside, solitary, 6in. long, scarcely expanded; sepals irregularly imbricated; stamens thirteen, rather long. July to October. Stem erect, six- to eight-angled; angles obtuse; prickles fuscous, short. *h.* 40ft. Tropical America, 1690.

C. p. monstrosus (monstrous). *fl.* much more expanded than in the type; outer sepals reddish, the inner ones pure white. Stem irregularly sulcate and tubercled; tubercles oblong, compressed, unequal, prickly at apex.

C. phœniceus (scarlet). *fl.* scarlet, less than 2in. long; stamens shorter than the petals; stigmas five. April to June. Stems ovate or sub-globose, 2in. to 3in. high, nine- to eleven-ribbed, obtuse, tufted, in its native haunts "forming dense masses, often 100 to 200 heads from a single base, the whole often of the shape and size of a bushel basket" (Engelmann); spines slender, almost bristly, the upper radial ones much shorter than the lower ones. North America. SYNS. *C. aggregatus*, *Echinocereus phœniceus*.

C. p. inermis (unarmed). A variety having no spines. 1896.

C. Phyllanthus (Phyllanthus). A synonym of *Phyllocactus Phyllanthus*.

C. Pitajaya (native name). A synonym of *C. variabilis*.

C. polyacanthus (many-spined).* *fl.* 2in. to 3in. long, lasting a week or more; tube spiny; petals deep blood-red, forming a shallow cup. Stem 10in. high, 2in. to 4in. in diameter, pale green or glaucous; ridges about eight, the spines placed along the angles in clusters of about half-a-dozen, ½in. apart. El Paso, Mexico. A beautiful species.

C. Pringlei (Pringle's). *fl.* white, tinged with green or purple, 2½in. to 3½in. long, not clustered at the summit, but scattered along the ribs for about 2ft. below the top. Stem erect, very stout, becoming 18ft. to 45ft. high and 2ft. to 4ft. in diameter, irregularly branching above the base; ribs thirteen, with contiguous areolæ, which become spineless on older portions; spines on younger areolæ terete, ½in. to ¾in. long, those on the older areolæ about fifteen, flattened, 1in. to 2½in. long. Lower California, &c., 1889. (G. & F. 1889, ii., p. 364, f. 92.)

C. procumbens (trailing).* *fl.* 3in. long and broad, developed on or near the ends of the branches; petals bright rose-purple, spreading and recurved; anthers forming a corona-like ring, enclosing the rayed stigma. May and June. Stems spreading, prostrate, emitting upright branches 3in. to 4in. high, ½in. thick, generally only quadrangular or square, with small spines in tufts along the angles. Mexico. A pretty little Cactus. See Fig. 234.

C. pterogonus (wing-angled). *fl.* pure white, sessile, 5in. to 6in. long and as much across, arising from just above the tuft of bristles at the margin; stamens pale yellow. August. Branches articulated; joints 3in. or more in thickness, 7in. long, usually four- (rarely five-) angled, the sinus of the lobes bearing a tuft of hair-like bristles and a spreading tuft of three or four prickles. Carthagena, South America, 1863. A straggling plant, needing support. (B. M. 5360.)

C. reductus (reduced). *fl.* three or four at the top of the stem, 3in. long and broad; petals white, slightly tinged with rose, serrated; stamens bright yellow, filling the whole flower-cup. Summer. Stem erect, 3ft. high, 4in. in diameter; ridges about fourteen, tumid and irregular, dingy glaucous-green; spines "as thick and strong as on a hedgehog," embedded in a tuft of grey wool, about a dozen in a cluster, most of them 1in. long, a few ½in. long. Mexico, 1796.

C. repandus. This old inhabitant of our gardens is now rare in cultivation; the flowers, which are very beautiful (see Fig. 235), unfortunately only last for a few hours. It requires a stove temperature.

C. Royeni (Royen's). A synonym of *Pilocereus Curtisii*.

Cereus—*continued.*

C. Sargentianus (Sargent's). *fl.* pink, with yellow anthers and a white style, 1in. long and wide, almost hidden by the spines. *fr.* red, smooth, said to be edible. Stems attaining a height of 15ft., five- or six-angled; spines ¼in. long, flexuous, disposed in dense tufts. Lower California, 1891. (G. & F. 1891, iv., p. 436, f. 69.)

FIG. 235. PORTION OF STEM WITH FLOWER OF CEREUS REPANDUS.

C. Tweediei (Tweedie's). *fl.* of a rich-orange-crimson, very handsome, numerous from the sides of the stem, 3in. long, curved upwards, the mouth oblique. September. Stem cylindrical, 3ft. to 6ft. high, with numerous furrows, the ridges not tubercled or mamillate; areolæ oval, brown-woolly; spines many, four or five stouter than the rest, erecto-patent. Buenos Ayres. (B. M. 4498.)

C. variabilis (variable). *fl.* whitish, 8in. long. Stems sub-erect, somewhat articulated and simple, or branched at base, green or glaucescent; ribs three to five, somewhat compressed, obtuse, obrepand; areolæ more or less remote, white- or fuscous-tomentose, at length woolly; prickles, six to eight outer ones, and one or two central ones, white, yellow, or blackish. Mexico, &c., 1809. SYN. *C. Pitajaya* (B. M. 4084).

CERINTHE. Although ten species have been described, the number distinct as such does not exceed four; they are natives of Europe, North Africa, and Western Asia. To the plants described on p. 300, Vol. I., the following should be added: it is probably a variety of *C. major*.

C. gymnandra (naked-anthered). *fl.* 1in. long; calyx leaflets having a purple band below the tip; corolla reddish-purple below, yellow above; anther-tips exserted. July. *l.* lin. to 4in. long, glaucous, ovate-oblong, contracted in the middle, bilobed at base, discoloured at tip, warty above; floral ones large. Stem 6in. to 12in. high. Italy, Algeria, &c., 1874. Annual. (B. M. 6130.)

CERISCUS (of Nees). A synonym of **Webera** (which *see*).

CEROPEGIA. SYN. *Systrephia.* The fifty species of this genus inhabit tropical and South Africa, the East Indies, the Malayan Archipelago, and tropical Australia. To those described on pp. 300-1, Vol. I., the following should be added:

C. bulbosa Lushii (Lush's). *l.* sub-sessile, very narrowly linear, 4in. to 8in. long (in the type they are petiolate, 1in. to 2in. long). Bombay, 1833. (B. M. 3300, under name of *C. Lushii.*)

C. Cumingiana (Cuming's). A synonym of *C. curviflora.*

C. curviflora (curved-flowered). *fl.* brown, often rather numerous, in a shortly-branched cyme; corolla tube 1in. long, densely hairy outside; corona having ten outer lobes and five inner ones. August. *l.* ovate or ovate-oblong, cordate at base, acuminate, 3in. to 4in. long; petioles ½in. to 1½in. long. Java, 1847. Stove. SYN. *C. Cumingiana* (B. M. 4349).

C. debilis (weak). *fl.* one to three on a peduncle, ½in. to ¾in. long; corolla pale purplish, glabrous, 1in. long, with some reflexed

Ceropegia—*continued.*

hairs inside. *l.* rather distant, ½in. to 1in. long, succulent, subterete. Stems several from a tuber, slender, weak, 3ft. to 4ft. long. Nyassaland, 1895. Stove.

C. Lushii (Lush's). A variety of *C. bulbosa.*

C. Meyeri (Meyer's). *fl.* pale purplish and blackish-green; corolla tube elongated pitcher-shaped, the segments linear, with reflexed margins. *l.* ovate-cordate, acuminate. South Africa, 1867. Plant pubescent. Greenhouse.

C. Monteiroæ (Mrs. Monteiro's). *fl.* about three at the top of short, lateral peduncles; sepals small, acute; corolla green, 2in. to 3in. long, the mouth trumpet-shaped, the five clawed lobes white, spotted purple-brown. July. *l.* opposite, 2in. to 3in. long, oblong-ovate, sub-acute or obtuse, succulent, pale green, the edges purplish, undulated. Branches white, mottled brown. Delagoa Bay, 1884. Greenhouse. (B. M. 6927.)

C. nobilis (noble). *fl.* pale purple on the outside, shortly pedicellate, about 1in. long, crenulated and ciliated. *l.* 1in. long, rounded. Stems very long. Root tuberous. South Africa, 1895. Greenhouse.

C. oculata (eyed). *fl.* very pale, spotted with purple below the lobes; corolla 2in. to 2½in. long, the base much inflated; coronal lobes short, two-toothed; peduncles hispid, 1½in. to 2in. long, four- to eight-flowered. September. *l.* ovate or ovate-cordate, acuminate, slightly ciliated, 4in. to 6in. long. Bombay, 1842. Stove. (B. M. 4093.)

C. sagittata (arrow-shaped). A synonym of *Microloma sagittatum.*

C. sinuata (sinuate). A synonym of *Microloma lineare.*

C. sororia (sisterly). *fl.* pale green, 1½in. to 2in. long, the reflexed lobes of the corolla darker green with a double row of transverse purple bars above, pink beneath; peduncles solitary, one-flowered. May. *l.* 4in. to 7in. long, less than ½in. broad, glaucous beneath. Stems almost filiform. Kaffraria, 1866. Greenhouse climber. (B. M. 5578.)

C. torulosa (somewhat twisted). A synonym of *Riocreuxia torulosa.*

C. Woodi (Wood's). *fl.* pinkish or violet, about 1in. long, with dark purple lobes; tube slender, distended at base. *l.* cordate-sub-orbicular, fleshy, variegated with silver markings on the upper surface; some of the axils producing small, globose tubers from which roots are emitted. Branches very slender, trailing. Natal, 1897. An excellent basket or rockery plant for a warm greenhouse. (G. C. 1897, xxii., pp. 357-8, f. 104.)

CEROPLASTES FLORIDENSIS. *See* **Scale.**

CEROPTERIS. *See* **Gmynogramme.**

CEROXYLON. SYNS. *Beethovenia, Klopstockia.* This genus embraces, according to the "Index Kewensis," nine species of very tall, unarmed, greenhouse Palms, found on the Andes of Colombia and Venezuela. Flowers rather large, monœcious on different spadices or polygamous; spadices elongated, much branched, the branches slender and flexuous; spathes about five, the lower ones complete, silky-tomentose; bracts minute. Fruit red or violet, as large as a Hazel-nut, globose or double. Leaves numerous, terminal, equally pinnatisect; pinnæ ensiform, acuminate, with obscure nerves.

C. ferrugineum (rusty). This species has been introduced to Continental gardens. (R. G. 1879, t. 977, f. 3.)

C. niveum (snowy). A synonym of *Diplothemium caudescens.*

CERVICINA. Included under **Wahlenbergia** (which *see*).

CESPEDESIA. Four species of tall, showy trees, natives of Peru, Colombia, and Panama, have been referred to this genus. Flowers yellow, showy, in large, terminal, bractless panicles; sepals and petals five, the latter much the larger and convolute. Leaves alternate, ample, coriaceous, obovate, narrowed to the petioles.

CESTRUM. Including *Meyenia* (of Schlechtendahl). Nearly 160 species of this genus have been described, but probably not more than 100 are distinct as such; they are restricted to the warmer regions of America. To those described on pp. 301-2, Vol. I., the following should be added:

C. Endlicheri (Endlicher's). The correct name of *C. corymbosum.*

C. Hartwegi (Hartweg's). *fl.* in cymose fascicles; corolla scarlet and glabrous within, wholly pubescent outside, nearly 1in. long; peduncles purplish. *l.*, those on the stem 4½in. long (including the petioles) and 2in. broad, pale beneath; those on the branches similar, but smaller. Branches terete, pubescent-tomentose. Bogota, 1883. Stove shrub.

CETERACH. An old genus of Ferns, now divided between **Asplenium** and **Gymnogramme** (which *see*). *A. officinarum* is identical with *Asplenium Ceterach.*

CETONIA AURATA. *See* **Rose Beetle.**

CEYLON BORAGE. *See* **Trichodesma zeylanicum.**

CHABRÆA. Included under **Leuceria** (which *see*).

CHADARA. A synonym of **Grewia** (which *see*).

CHÆNACTIS (from *chaino*, to gape, and *aktis*, a ray; the enlarging orifice and limb of the marginal corollas in most species simulates a kind of ray). ORD. *Compositæ.* A genus embracing about a dozen species of mostly hardy annual or perennial herbs or under-shrubs, natives of North (mostly Western) America. Flower-heads yellowish, white, or flesh-coloured, pedunculate, solitary or cymose; involucre campanulate or sub-hemispherical; receptacle flat, foveolate; pappus usually shorter or of fewer paleæ in the outer florets. Leaves alternate, mostly pinnately dissected. *C. tenuifolia*, the only species known in cultivation, thrives in ordinary garden soil, and may be increased by seeds or by division.

C. tenuifolia (slender-leaved). *fl.-heads* yellow, ¼in. high, scattered or paniculately disposed on short, slender peduncles. *l.* once or twice pinnately parted into irregular and small, linear or oblong, or sometimes nearly filiform, lobes. California (on the sea-shore), 1883. (R. G. 1275, f. 2.)

CHÆNANTHE. A synonym of **Diadenium** (which *see*).

CHÆNARRHINUM (sometimes erroneously spelt *Chænorrhinum*). Included under **Linaria** (which *see*).

CHÆNESTHES. A synonym of **Iochroma** (which *see*).

CHÆNOMELES. A synonym of **Cydonia** (which *see*).

CHÆNOSTOMA. SYN. *Sutera.* About twenty-six species, all South African, are referred to this genus. To those described on p. 302, Vol. I., the following should be added:

C. fastigiatum (pyramidal). *fl.* pink, small, in racemes 6in. to 9in. long. July to October. *l.* opposite, ovate-lanceolate, toothed. Stem much branched. *h.* 8in. to 12in. Annual. SYN. *Manulea fastigiata* (of gardens). There is a variety with white flowers.

CHÆROCAMPA ELPENOR. *See* **Sphingidæ.**

CHÆROPHYLLUM SATIVUM. A synonym of **Anthriscus cerefolium** (which *see*).

CHÆTANTHERA. Including *Proselia.* Twenty-six species, all natives of South America, are embraced in this genus.

CHÆTOCALYX. SYNS. *Bonninghausia, Rhadinocarpus.* There are about eight species of this genus; one is New Mexican, another is found in the Antilles, and the remainder are tropical South American. Flowers yellow; inflorescence axillary; pedicels one-flowered. Leaves impari-pinnate. Stipules lanceolate or linear.

CHÆTOCHILUS. A synonym of **Schwenkia** (which *see*).

CHÆTOCHLÆNA. Included under **Onoseris** (which *see*).

CHÆTOCLADUS. A synonym of **Ephedra** (which *see*).

CHÆTODISCUS. A synonym of **Eriocaulon** (which *see*).

CHÆTOSPORA. Included under **Schœnus** (which *see*).

CHÆTOTHYLAX (from *chaite*, a bristle, and *thylax*, a capsule). ORD. *Acanthaceæ.* A small genus (four or five species) of stove herbs, under-shrubs, or shrubs, dispersed over the region extending from South Brazil to Central America, and allied to *Justicia.* Flowers sessile, solitary or spicate; corolla limb bilabiate, the anterior lobe trifid; stamens two. Leaves entire. Only one species—*C. eustachiana* (SYN. *Justicia eustachiana*, B. M. 2076)—has been introduced, and probably that is lost to cultivation.

CHAILLETTIACEÆ. A natural order embracing about thirty-eight species of tropical trees and shrubs, ranking between *Meliaceæ* and *Olacineæ.* It is of no importance from a horticultural standpoint.

CHAIN FERN. *See* **Woodwardia.**

CHAIXIA. A synonym of *Ramondia.* *C. Myconi* is identical with **R. pyrenaica** (which *see*).

CHAKIATELLA. A synonyn of **Wulffia** (which *see*).

CHALCAS. A synonym of **Murraya** (which *see*).

CHAMÆBATIA FOLIOLOSA. A synonym of **Spiræa Millefolium** (which *see*).

CHAMÆBUXUS. Included under **Polygala** (which *see*).

CHAMÆCERASUS ALBERTI. A garden name for **Lonicera Alberti** (which *see*).

CHAMÆCERASUS ALPIGENA NANA. A garden name for **Lonicera alpigena nana** (which *see*).

CHAMÆCISTUS. *See* **Rhodothamnus Chamæcistus.**

CHAMÆCISTUS (of S. F. Gray). A synonym of **Loiseleuria** (which *see*).

CHAMÆCLADON (from *chamai*, dwarf, and *kladon*, a branch; in allusion to the habit of the species). ORD. *Aroideæ.* A genus comprising about twelve species of stove herbs, inhabiting tropical Asia and the Malayan Archipelago, and included by Sir J. D. Hooker ("Flora of British India") under **Homalomena** (which *see*). Flowers monœcious, all perfect; spathe small, sub-cylindrical, convolute below, gaping above, persistent; spadix inappendiculate, included, stipitate, sub-cylindrical, the male inflorescence much longer than the female. Leaves elliptic-ovate, varying to lanceolate, rarely cordate at base, the nerves nearly reaching the margins; petioles elongated, long-sheathing. Candex short or almost wanting. Only one species is known in gardens. For culture, *see* **Schismatoglottis.**

C. metallicum (metallic-lustred). *fl.*, spathe fuscous-purple, 1in. long, mucronate; peduncle purplish, slender, 1in. to 1½in. long. *l.* 3½in. to 5in. long, 2½in. to 3½in. broad, elliptic, sub-acute, shortly mucronate, rounded or slightly cordate at base, metallic-green above, purplish beneath; veins five to eight on either side the midrib, curved, ascending; petioles 2½in. to 3in. long, nearly ¼in. thick, channelled, purplish. *h.* about 7in. Borneo, 1884. (I. H. 1884, 539.)

CHAMÆCYPARIS. America and Japan are the headquarters of this genus, which is included by Bentham and Hooker under *Thuya*, and by Dr. Masters under *Cupressus.* To the species and varieties described on pp. 303-4, Vol. I., the following should be added:

C. filifera aurea (golden). This handsome form is distinguished from the type by the rich golden colour of the young growths. 1889.

C. Lawsoniana erecta alba (erect, white). A variety of slender, twiggy growth, stiff and compact, but feathery at the points, of a rich, glaucous-whitish-grey or silvery hue. 1882.

C. L. filifera (thread-bearing). Branches spreading, well clothed with deep green foliage; branchlets long and lightly divided. 1896. A very handsome form.

C. L. Rosenthalii (Rosenthal's). A garden variety, differing from the type in its pyramidal growth, and in the branchlets not drooping. 1886.

C. L. stricta (erect). An erect variety. 1888.

C. nutkaensis. Other varieties are: *albo-variegata* (white-variegated), *aurco-viridis* (golden and green), *gracilis* (slender), *lutea* (yellow), see Fig. 236 (for which we are indebted to Messrs. Veitch and Sons), and *nidifica* (nest-like).

C. obtusa. Other varieties are: *erecta viridis* (erect, green), *argentea* (silvery), *Ketcleeri*, *magnifica* (magnificent), *pygmæa* (dwarf), and *Troubetzkoviana.*

C. pisifera. There are numerous garden forms of this species, among the principal of which are *casuarinifolia* (having Casuarina-like leaves), *plumosa* (feathery), and *squarrosa* (squarrose).

C. sphæroidea atrovirens (dark green). *l.* and branchlets of a bright shining green.

Chamæcyparis—*continued.*

C. s. nana (dwarf). A very diminutive and quite glaucous variety.

C. squarrosa sulphurea (sulphur-coloured). This handsome variety differs from the type in the ends of its growths being of a pale sulphur-yellow. 1894.

Chamædorea—*continued.*

C. Ghiesbreghtii (Ghiesbreght's). A synonym of *Gaussia Ghiesbreghtii.*

C. graminifolia. This very graceful, plume-like species is shown in Fig. 237.

C. Hartwegii (Hartweg's). A synonym of *C. Sartorii.*

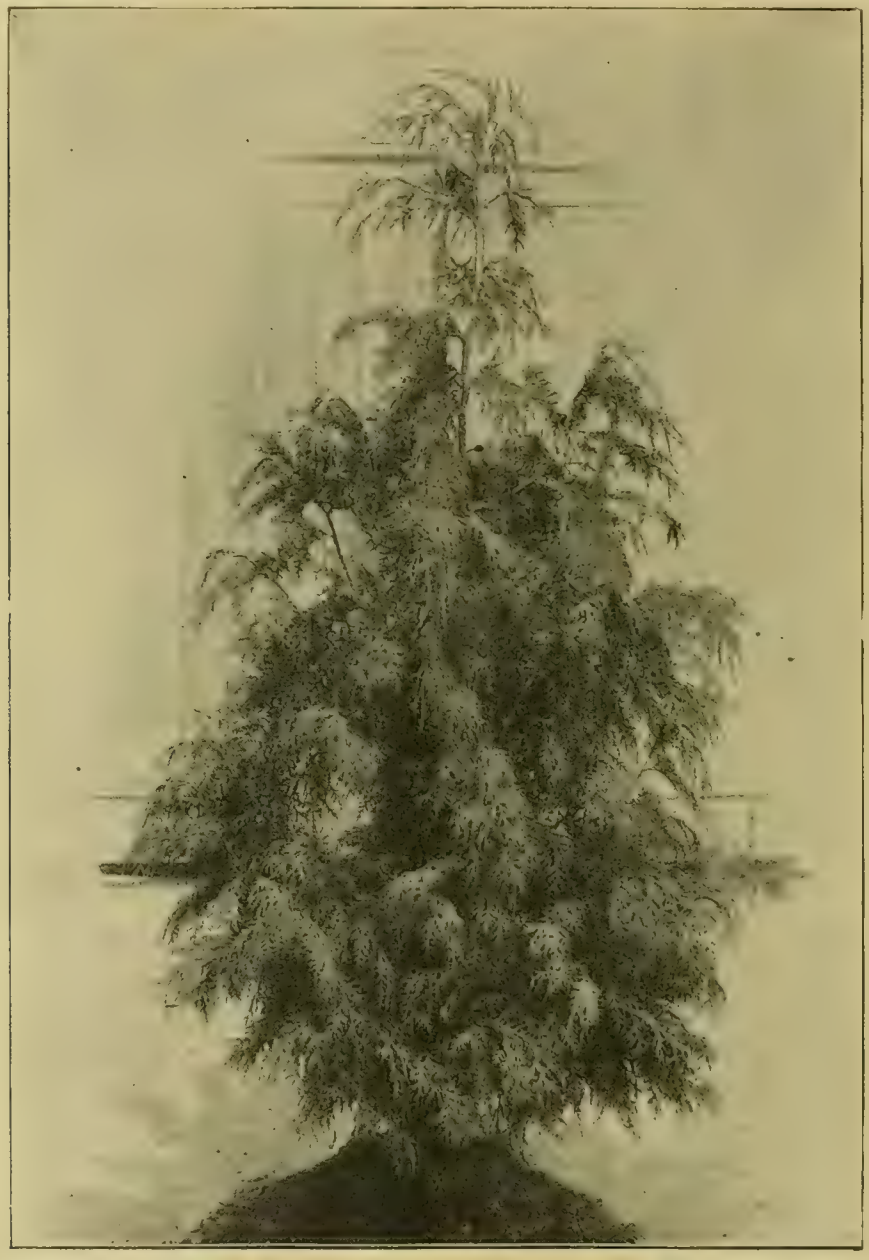

FIG. 236. CHAMÆCYPARIS NUTKAENSIS LUTEA.

CHAMÆDOREA. Including *Morenia.* This genus comprises about sixty species, natives of Western tropical America. To those described on p. 305, Vol. I., the following should be added:

C. concolor (one-coloured). *fl.*, spadix golden, much-branched. *fr.* golden, obovate. *l.* having oblong or trapezoid, falcate-acuminate pinnæ; petioles sub-terete, channelled at base. Stem annulate. Mexico.

C. Karwinskiana (Karwinski's). A synonym of *C. elatior.*

C. polita (polished). *l.* bifid when young, breaking up with age into two pairs of pinnæ, with a large, terminal leaflet; petioles (and stems) smooth. Mexico, 1884.

C. pulchella (rather pretty). *l.* produced in profusion, gracefully arched, pinnate, having very numerous linear leaflets. 1885. A very ornamental Palm, suitable for table decoration.

Chamædorea—*continued.*

FIG. 237 CHAMÆDOREA GRAMINIFOLIA.

C. stolonifera (stolon-bearing). *fl.* yellow, spadices intrafoliolar, branched, the males shorter than the leaves. *l.* terminal, 10in. long, bright green, shortly petiolate, obovate, cleft to below the middle into two dimidiate-oblong, nine-nerved segments; outer margin of the segments crenately toothed, the inner slightly convex; petioles 1in. to 1¼in. long. Stems slender, 3ft. high, growing in dense tufts, with interlaced stolons. South Mexico, 1882. (B. M. 7265.)

C. Wobstiana (Wobst's). An ornamental Palm, bearing a close resemblance to *C. Sartorii*, but it is more robust, and has more numerous leaves. 1885.

Other species in cultivation, but very rarely met with, are: *C. amazonica*, *C. corallina*, *C. elegantissima*, *C. Pringlei*, *C. pygmæa*, and *C. Ruizii*.

CHAMÆFISTULA. Included under **Cassia** (which *see*).

CHAMÆLAUCIUM. Ten species of this genus have been described, all Australian, but only one has been introduced.

C. plumosum (feathery). A synonym of *Verticordia Fontanesii*.

CHAMÆLIRIUM (from *chamai*, dwarf, and *Lirion*, a Lily; in allusion to the habit and affinity of the plant). SYNS. *Dasurus*, *Diclinotrys*, *Ophiostachys*. ORD. *Liliaceæ*. A monotypic genus. The species, *C. luteum* (SYNS. *Helonias lutea*, B. M. 1062, *H. pumila*), is a hardy, erect perennial, native of North America, with a dense raceme of tiny yellow flowers, leaves 3in. to 6in. long, and a stem 1ft. to 3ft. high. It is of no great horticultural value.

CHAMÆNERIUM, or **CHAMÆNERION.** Included under **Epilobium** (which *see*).

CHAMÆPEUCE. To the species described on p. 306, Vol. I., the following should be added:

C. afra (dark). *fl.-heads* bright purple, large; involucre thick, with lanceolate scales. *l.* dark green, blotched with white, disposed in a rosette, sessile, linear-lanceolate, glabrous above, white-tomentose beneath. Stem 2½ft. high, bearing eight to twelve flower-heads. Armenia, &c., 1894. A handsome, half-hardy, Thistle-like biennial.

C. Sprengeri (Sprenger's). *fl.-heads* white, fragrant; involucral scales smooth. *l.* linear-lanceolate, dark green, with white veins, the side veins running into two or three marginal spines. 1883. Garden hybrid. A hardy perennial, useful for rockwork and carpet-bedding.

CHAMÆPITHYS. Included under **Ajuga** (which *see*).

CHAMÆRANTHEMUM. Two or three species, all Brazilian, make up this genus. Flowers white or yellowish, solitary or in spikes; corolla tube long and slender, the limb of five spreading, imbricated, flat lobes; stamens four, didynamous, affixed towards the middle of the tube, included. Leaves rather large, membranous, entire, sometimes variegated. To the species, &c., described on p. 306, Vol. I., the following should be added:

C. Gaudichaudii (Gaudichaud's). *fl.* distant, disposed in a solitary, terminal spike 1½in. long. *l.* sub-cordate-ovate, acute, 3in. to 3½in. long, 2¼in. broad; petioles ½in. long. Stem creeping at base. 1869. Plant softly velvety. (F. d. S. 1767.)

C. igneum. *Stenandrium igneum* is identical with this species.

C. nitidum (shining). A synonym of *Ebermaiera nitida*.

CHAMÆRIPHES. A synonym of **Chamærops** (which *see*).

CHAMÆROPS. SYN. *Chamæriphes*. According to the "Genera Plantarum," the two species are restricted to the Mediterranean region, but the "Index Kewensis" includes one or two others, natives of South America and Mauritius. *See also* **Acanthorhiza, Livistona,** and **Nannorhops.**

C. humilis dactylocarpa (finger-fruited). This variety is distinguished from the type in having elongated fruit. 1889. There is also a tall, tree-like variety—*arborescens*.

C. h. elegans (elegant). A very beautiful variety for indoor decoration. See Fig. 238.

C. macrocarpa is a variety of *C. humilis*.

In addition to *dactylocarpa* and *macrocarpa*, the following varieties are grown at Kew: *bilaminata*, *elegans*, and *tomentosa*.

CHAMÆSTEPHANUM. Included under **Schkuhria** (which *see*).

CHAMÆTHRINAX (from *chamai*, dwarf, and *Thrinax*, an allied genus). ORD. *Palmæ*. A small genus of stove Palms. *C. Hookeriana*, a native of Buenos Ayres, is in the Kew collection, but is not in general cultivation.

FIG. 238. CHAMÆROPS HUMILIS ELEGANS.

CHAMELUM (from *chamelos*, low, humble; in allusion to the habit of the plant). ORD. *Irideæ*. A small genus (two species) of half-hardy, perennial herbs, natives of Chili. Flowers two or more in a spathe, very shortly pedicellate; perianth yellow, the tube slenderly funnel-shaped, the lobes sub-equal, erecto-patent; stamens affixed to the throat, the filaments connate in a cylindrical tube; spathes terminal, solitary or numerously aggregate. Leaves few, linear, rather broad, or sub-terete. *C. luteum* is known to cultivation. It thrives in well-drained, sandy loam, and may be propagated by division of the rootstock. In many parts of England it would probably prove hardy.

C. luteum (yellow). *fl.*, perianth 2in. long, highly glabrous, the limb segments lanceolate-linear; spathes two or three, erect, 1½in. long, glabrous, striated and pubescent at apex, sharply mucronate; scape terete, eight lines long, two-flowered. *l.* linear-filiform, erect, recurved, 2½in. long, scarcely half-a-line broad, shortly whitish-pubescent. 1884. (R. G. 1129, f. 6-9.)

CHAMOMILLA (in part). Included under **Alyssum** (which *see*).

CHAMORCHIS. Included under **Herminium** (which *see*).

CHARDOON. *See* **Cardoon.**

CHARITY. *See* **Polemonium cæruleum.**

CHARLES'S SCEPTRE. *See* **Pedicularis Sceptrum-Carolinum.**

CHARLWOODIA. Included under **Cordyline** (which *see*).

CHARTACEOUS. Resembling parchment or tough writing-paper in texture.

CHASMANTHIUM. A synonym of **Uniola** (which *see*).

CHASTE TREE. *See* **Vitex Agnus-castus.**

CHATELANIA. A synonym of **Tolpis** (which *see*).

CHAYOTA. A synonym of **Sechium** (which *see*).

CHEILANTHES. Lip Fern. Including *Allosorus* (in part), *Myriopteris*, *Plecosorus*, *Schizopteris*. Upwards of sixty species, many of them extending beyond the tropics, are embraced in this genus, in which there is no British representative. It is strikingly distinct, and includes some of the most elegant and beautiful Ferns in cultivation. They are all of an evergreen nature, and although coming principally from the Tropics the majority of them thrive best in a house where the temperature seldom exceeds 60deg. with artificial heat; a good many of them are even suited with a minimum greenhouse temperature of 45deg. in winter. This is no doubt owing to their being found in their native habitats at great elevations and in dry, rocky, exposed situations. Anyhow, wherever Cheilanthes are seen at a disadvantage and in bad condition, it is invariably due to their being kept in an over-heated, close stove, and frequently syringed—treatment which produces shapeless, emaciated plants deprived of all beauty. They should be grown as near to the light as possible, either on shelves against the glass, or in hanging baskets suspended from the roof, for which purpose some of them are very well adapted. No overhead watering or syringing should at any time be allowed, as this is quite as injurious to them as any extra heat; but they should be supplied with an abundance of water at the roots, and for this purpose they must be either potted or basketed in good fibrous peat and sand, with their crowns kept well above the rim of the pot. The compost should be very porous, and to that effect a small portion of sandstone and charcoal broken up into little pieces should be added to it. For the successful management of these charming Ferns, the two great evils to be avoided are strong, close heat and overhead moisture, and the points most beneficial to their welfare are abundance of water at the roots, an open, porous compost for them to grow in, a somewhat airy atmosphere, and plenty of light overhead. Most of the Cheilanthes, if not all, reproduce themselves freely and true from spores, which germinate very readily and form young plants in a comparatively short time.

To those described on pp. 307-9, Vol. I., the following should be added:

C. aurea (golden). *sti.* tufted, 2in. to 3in. long, ebeneous, slightly scaly. *fronds* 3in. long, deltoid, twice or thrice pinnatifid, yellow-mealy above, the under-surface covered with dense yellow powder; pinnæ deltoid, the lowest much the largest. *sori*, involucres broad and membranous. Peru and Guatemala. Stove. SYNS. *C. Borsigiana*, *Aleuritopteris aurea*.

C. Borsigiana (Borsig's). A synonym of *C. aurea*.

FIG. 239. CHEILANTHES FARINOSA.

C. californica (Californian). A synonym of *Hypolepis californica*.

C. candida (white). A synonym of *Nothochlæna sulphurea*.

C. chlorophylla (green-fronded). *rhiz.* stout, paleaceous. *sti.* contiguous, 1ft. to 1½ft. long, erect, polished, naked, dark chestnut-brown. *fronds* 1ft. to 1½ft. long, 4in. to 8in. broad, ovate-lanceolate, tripinnatifid; pinnæ 3in. to 5in. long, ¾in. to 1½in. broad, distant, lanceolate; pinnules lanceolate, cut down to the rachis into numerous entire, linear-oblong segments. *sori* numerous, small, roundish, placed on both edges. South America, 1833. Greenhouse. SYN. *Hypolepis spectabilis* (H. S. F. ii, 33 B).

FIG. 240. FROND OF CHEILANTHES HIRTA.

C. cuneata (wedge-shaped). *sti.* red, turning blackish with age. *fronds* glabrous, coriaceous, dull green, tri- or quadripinnate, cuneate or broadly-ovate, 1ft. to 1½ft. long (of which more than half is naked); pinnæ and pinnules ovate, acuminate. *sori* continuous all along the margins of the segments. Mexico. Greenhouse. SYN. *C. rufescens* (of gardens).

Cheilanthes—*continued.*

C. dicksonioides (Dicksonia-like). A synonym of *Hypolepis tenuifolia.*

C. Ellisiana (Ellis's). A form of *C. hirta.*

C. farinosa. This widely-distributed Fern has the under-surface of its fronds thickly coated with fine white powder. See Fig. 239.

C. ferruginea (rusty). A garden synonym of *Nothochlæna ferruginea.*

C. hirta Ellisiana (Ellis's). *fronds* broader, more finely divided, and more upright than in the typical plant, a frond of which is shown in Fig. 240.

C. profusa (profuse). A synonym of *Pellæa involuta.*

C. pulveracea (powdery). A synonym of *Nothochlæna sulphurea.*

FIG. 241. CHEILANTHES RADIATA.

C. radiata. This pretty little stove Fern was, owing to its general appearance (see Fig. 241), for a long time considered to be a species of *Adiantum.*

C. rufescens (reddish). A garden synonym of *C. cuneata.*

CHEILOPLECTON. Included under **Pellæa** (which *see*).

CHEILOSANDRA. A synonym of **Rhynchotechum** (which *see*).

CHEIMATOBIA BRUMATA. *See* **Winter Moth.**

CHEIRANTHERA (from *cheir*, the hand, and *anthera*, an anther; in allusion to the prominent anthers). ORD. *Pittosporeæ.* A small genus (four species) of greenhouse shrubs or under-shrubs, with flexuous or somewhat twining branches. Flowers nodding or sub-erect; sepals distinct; petals obovate-oblong, spreading nearly to the base; stamens bent to one side of the flower, facing the incurved aspect of the attenuated ovary; filaments filiform, much shorter than the long anthers; peduncles terminal, one- or loosely many-flowered. Leaves narrow, entire.

Cheiranthera—*continued.*

C. linearis and *C. parviflora*, which are probably the only species in cultivation, require similar treatment to **Sollya** which *see*).

C. linearis (linear). *fl.* azure-blue; pedicels erect; inflorescence terminal, corymbose. November. *l.* alternate, linear, slightly acute, entire or almost incised at apex. Australia, 1822. An erect shrub. (F. d. S. 856.)

C. parviflora (small-flowered). *fl.* purple, solitary, star-shaped, 1in. across, terminal, on long peduncles. July. *l.* sub-sessile, linear- or oblong-ovate or lanceolate, acute or obtuse, the margins recurved. Stems wiry. Western Australia, 1892. An elegant twiner, closely resembling the well-known *Sollya heterophylla.* (B. M. 7261.)

CHEIRANTHODENDRON. A synonym of **Cheirostemon** (which *see*).

CHEIRANTHUS. About a dozen very variable species, natives of temperate regions, are retained in this genus. Others formerly included hereunder are now referred to **Erysimum, Malcolmia, Matthiola,** &c.

CHEIROGLOSSA. *See* **Ophioglossum.**

CHEIROPTERA. *See* **Bats.**

CHEIROSTEMON. SYN. *Cheiranthodendron.* This genus belongs to ORD. *Sterculiaceæ.*

CHEIROSTYLIS. About eight species, natives of India, the Malayan Archipelago, and tropical Africa, are included in this genus. Sepals connate to the middle in a tube; lip with a saccate or cymbiform base and a two-lobed, toothed or pectinate limb; columnar appendages long, fleshy. To the information given on p. 310, Vol. I., the following should be added:

C. marmorata. The correct name, according to the "Index Kewensis," is *Dossinia marmorata.*

C. grandiflora and *C. montana* (B. H. 1861, t. 18) have also been introduced, but are not in general cultivation.

CHELONANTHERA. The species formerly classed under this name are now referred to **Cœlogyne** and **Pholidota.**

CHELONE. As now limited, this genus embraces only four species, several plants formerly included here being now classed under **Pentstemon.** *C. glabra* is regarded by Dr. Asa Gray as a distinct species.

CHENOLEA (from *chen*, a goose, and *leia*, prey; the plant is said to be eaten by geese). ORD. *Chenopodiaceæ.* A genus including about a score species of greenhouse or hardy herbs or shrubs, widely distributed. *C. diffusa* has been introduced, but is of no horticultural value.

CHENOPODIUM. *Blitum* is included in this genus.

CHERLERIA. Included under **Arenaria** (which *see*).

CHERMES ABIETIS. *See* **Spruce-Gall Aphis.**

CHERMES OF THE APPLE. This name is sometimes applied to the **Apple Sucker** (*Psylla mali*) (which *see*). It is, however, correctly given to a genus, one species of which, *C. abietis* (known as the Spruce Gall Aphis) is injurious to young Spruce trees.

CHEROKEE ROSE. *See* **Rosa sinica.**

CHERRY. Stocks are of more importance in the case of this fruit than many imagine. On some land the Wild Gean is best for all forms of trees, while on others the Mahaleb is preferable for either dwarf, wall, or half-standard trees. For all land with a very dry subsoil—sand or gravel—the Mahaleb is superior; while, for all except dwarf trees on deeper and heavier soil, the Wild Gean is the more suitable.

Cherry—*continued.*

Gumming is usually induced by either bad drainage or winter pruning. The remedy is obvious in either case.

Varieties. The following are all worth attention:

Autumn Bigarreau. *See* **Bigarreau Belle Agathe.**

Bigarreau Belle Agathe, or **Autumn Bigarreau.** Fruit small, black, and very sweet; valuable for the long time it will hang on the trees after ripening.

Bigarreau de Hedelfingen. Fruit large, fine deep black, and with a rich, high flavour. A fine mid-season variety.

Bigarreau de Schreken. Fruit large, black, of a rich and refreshing flavour. A good early variety, answering well as a bush or a wall tree.

Early Red. Fruit very large, red, juicy, and rich. An excellent early variety.

Emperor Francis. Fruit large, red, of fine flavour. A valuable late variety.

Geans.—GUIGNE D'ANNONAY. Fruit large, black, flesh firm, juicy, and rich flavour. An excellent early variety. GUIGNE'S DE WINKLER. Fruit large, red, of very luscious flavour, and will hang a long time on the trees. Late. DUKE'S BELLE DE CHOISY. Fruit large, pale yellowish-red, of sweet and pleasing flavour. Mid-season.

Monstrueuse de Mezel. Fruit very large, pale rose, sometimes striped with red. Flesh firm, very juicy, and of high quality. A good bearer on all forms of trees. Mid-season.

Noir de Guben. Fruit large and lustrous in colour, of good flavour. An abundant bearer.

CHERRY MOTH (*Argyresthia nitidella*). Belonging to that little-understood group of Moths known as the *Tineidæ* is the genus above named. The species is of some economic importance, inasmuch as it is at certain seasons responsible for a great deal of mischief to Cherry trees. The first indication that the gardener has that anything is amiss with his crop is the falling of the fruit in immense numbers, just after the "set." By many this is ascribed to night frosts, east winds, and the like; whereas in the majority of cases the injury is due to the attack of the minute caterpillar of the above-named abundant Moth (Fig. 242), its presence being detected by the minute hole to be found in the fallen fruits.

FIG. 242. CHERRY MOTH.

About midsummer the Moths are on the wing, and though observed in goodly numbers around Cherry trees, there is nothing in the insect's appearance to cause the gardener to view it with suspicion—clad in the simplest of attire, light brown, with whitish margins, and a dark brown band towards the centre. One characteristic of the genus is the peculiar resting position of these insects, which look as if they were trying to stand upon their heads, by reason of the position of the body. When egg-laying takes place, the Moths select the shoots of the tree for the purpose. The eggs remain unhatched through the winter, and are not affected by the severest cold.

As the spring approaches, and the embyrò fruit is forming, the caterpillars hatch out, and commence to work their way into the undeveloped fruits. They thus feed for about a fortnight, when the fruits fall to the ground in the manner indicated. The caterpillars are greenish, but afterwards take on a dull grey. They pupate in the fruits in a white cocoon.

By way of remedial measures nothing can be done, and the gardener is obliged to trust to the birds to preserve the balance. It will, however, be found good policy to collect the fallen fruits in spring and burn them.

CHEVALIERIA or **CHEVALLIERA.** Included under **Æchmea** (which *see*).

CHIAZOSPERMUM. Included under **Hypecoum** (which *see*).

CHICH PEA. *See* **Cicer arietinum.**

CHICKEN GRAPE. *See* **Vitis cordifolia.**

CHICKLING VETCH. *See* **Lathyrus sativus.**

CHICKWEED WINTERGREEN. *See* **Trientalis.**

CHILIAN CROCUS. *See* **Tecophilæa cyanocrocea.**

CHILIANDRA. A synonym of **Rhynchotechum** (which *see*).

CHILIAN NUT. *See* **Guevina Avellana.**

CHILIANTHUS (from *chiloi*, a thousand, and *anthos*, a flower; the flowers are very numerous). ORD. *Loganiaceæ.* A small genus (four species) of greenhouse, tomentose, South African trees or shrubs, closely allied to *Buddleia*, but having exserted anthers; they bear dense cymes of small flowers disposed in a terminal panicle, and opposite, entire or toothed leaves. *C. oleaceus* has been introduced. For culture, *see* **Buddleia.**

C. arboreus (tree-like). A synonym of *C. oleaceus.*

C. oleaceus (olive-like). *fl.* white, very pretty; stamen much longer than the corolla; panicles corymbiform, densely many-flowered. September. *l.* opposite, shortly petiolate, oblong-lanceolate, entire, 1½in. to 3½in. long, white-tomentose beneath. Branches also tomentose, flexuous. *h.* 6ft. 1816. SYN. *C. arboreus.*

CHILIOPHYLLUM (of De Candolle). Included under **Zaluzania** (which *see*).

CHILOCALYX (of Turczaninow). A synonym of **Atalantia** (which *see*).

CHILODIA. Included under **Prostanthera** (which *see*).

CHILOGNATHA. *See* **Millipedes.**

CHILOSTIGMA. A synonym of *Aptosimum.* *See* **Ohlendorffia.**

CHIMAPHILA UMBELLATA. A synonym of **C. corymbosa** (which *see*).

CHIMONANTHUS. SYN. *Meratia.* This genus is monotypic.

CHINA ROSE. *See* **Rosa indica.**

CHINESE ARTICHOKE. *See* **Crosnes.**

CHINESE HAWTHORN. *See* **Photinia serrulata.**

CHINESE KIDNEY-BEAN. *See* **Wistaria chinensis.**

CHINESE LARCH. *See* **Pseudolarix.**

CHINESE PARASOL. *See* **Sterculia platanifolia.**

CHINESE PEPPER. *See* **Xanthoxylum piperitum.**

CHINESE PRIMROSE. *See* **Primula sinensis.**

CHINESE SACRED LILY. *See* **Narcissus.**

CHINESE YEW. *See* **Cephalotaxus** and **Podocarpus chinensis.**

CHIOCOCCA. SYN. *Siphonandra.* Tropical America is the home of this genus, which embraces six to eight species.

CHIOGENES (from *chion*, snow, and *genos*, offspring; in allusion to the snow-white berries). Creeping Snowberry. SYNS. *Lasierpa, Phalerocarpus.* ORD. *Vacciniaceæ.* A monotypic genus. The species is a hardy, slender, trailing or creeping, marsh-loving evergreen, requiring similar culture to **Oxycoccus** (which *see*).

C. hispidula (slightly hispid). *fl.* white, very small and inconspicuous, solitary in the axils of the small, Thyme-like leaves, on short, nodding peduncles. April. *fr.* a white, globular berry, minutely bristly, slightly spicy, but otherwise insipid, ripe late in the summer. Branches filiform, strigose-hispid. North America, 1815. SYNS. *Gaultheria serpyllifolia, Phalerocarpus serpyllifolia.*

CHIONASPIS EUONYMI. *See* **Scale.**

CHIONASPIS FRAXINI. *See* **Ash Bark Scale.**

CHIONODOXA. The four species of this genus are natives of the Orient. To those described on p. 315, Vol. I., the following should be added:

C. gigantea (gigantic). A synonym of *C. Luciliæ grandiflora*

C. grandiflora (large-flowered). *fl.* violet-blue, white in the centre, larger than in *C. Luciliæ.* Plant also more robust. 1891. A garden variety.

C. Luciliæ. *See* **Chionscilla.**

C. L. grandiflora (large-flowered). *fl.* soft violet-blue with a small white centre, larger and more numerous than in the type, Asia Minor, 1873. SYN. *C. gigantea* (Gn., Sept. 3, 1892, t. 873).

Chionodoxa—*continued.*

C. sardensis (Sardis). *fl.* similarly coloured to those of *C. Luciliæ*, but not shading lighter in the centre; perianth stellate-infundibuliform, the limb twice exceeding the tube; pedicels cernuous; scape two- to six-flowered. *l.* convolute-channelled. 1887. (Gn. xxviii., p. 178; R. G. 1255 B-C.)

CHIONOPHILA (from *chion*, snow, and *phileo*, to love; the plant is found growing on the snow-capped Rocky Mountains of Colorado). ORD. *Scrophularineæ*. A monotypic genus. This species is a dwarf, hardy perennial, glabrous or nearly so, thriving in well-drained soil on the rockery. It may be propagated by seeds or by division.

C. Jamesii (Dr. James's). *fl.* few or many in a dense spike, mostly secund; corolla dull cream-colour, above ¼in. long. Summer. *l.* thickish, entire, mostly radical in a tuft, spathulate or lanceolate, tapering into a scarious, sheathing base; those on the scape-like flowering stems one or two pairs or occasionally alternate, linear. *h.* 1in. to 3in. 1888. (G. & F. 1888, i., p. 79, f. 15.)

CHIONSCILLA (name compounded from *Chionodoxa* and *Scilla*). ORD. *Liliaceæ*. This name is applied to a series of natural hybrids between *Scilla bifolia* and *Chionodoxa Luciliæ*. For culture, see **Scilla**.

C. Alleni (Allen's) is a very handsome plant, in colour and general habit resembling a good *C. Luciliæ*, but the perianth segments are cut to the base; in structure the plant comes near to *Scilla bifolia*. 1889. (G. C. 1897, i., p. 191, f. 57.)

CHIRITA. SYN. *Calosacme*. Including *Liebigia* and *Tromsdorffia* (of R. Brown). This genus embraces about twenty species, mostly Indian, a few being West Malayan and Chinese; it is very closely allied to *Didymocarpus*, but the stigma is "said to be sub-entire in *Didymocarpus*, bifid in *Chirita*; in *Chirita* it varies with age" (C. B. Clarke). To the species described on pp. 315-6, Vol. I., the following should be added:

C. depressa (depressed). *fl.* violet, 1¼in. long; corolla tube somewhat inflated, thrice as long as the rounded lobes; cymes few-flowered, shortly pedunculate. June. *l.* rosulate, shortly and broadly petiolate, broadly ovate, obtuse, bluntly serrated. Rhizome short, stout. China, 1889. Greenhouse. A dwarf species, soon forming a dense mass of foliage. (B. M. 7213.)

C. hamosa (hooked). *fl.*, corolla ⅜in. long, the tube slender, nearly white, the mouth pale blue or somewhat rose-coloured; peduncles connate and adnate to the petiole. *l.* opposite, ovate or elliptic, acute, 1in. to 6in. long, ½in. to 4in. broad, rounded at base, weakly hairy on both surfaces. Stem varying from ½in. to 20in. in length. India, 1896. SYN. *Rottlera hamosa* (R. H. 1896, p. 184).

C. Horsfieldii (Horsfield's). *fl.* drooping; corolla pale yellowish-white, with a purple tinge near the base, tubular, the limb of five spreading lobes; peduncles aggregated. February. *l.* large, opposite, spreading, ovate or elliptical, acuminate, serrated, hairy above, rough with harsh down. Stem herbaceous, 1½ft. to 2ft. high. Java, 1847. SYNS. *Liebigia speciosa* (B. M. 4315), *Tromsdorffia speciosa*.

C. Walkeri (Walker's). *fl.*, larger peduncles one- to five-flowered. Otherwise like *C. Moonii*. Ceylon, 1845. (B. M. 4327, under name of *C. Walkeriæ*.)

CHIRONIA. Fourteen species of this genus have been described. To those given on p. 316, Vol. I., the following should be added. Several plants formerly included here are now referred to **Exacum, Orphium, and Sabbatia.**

C. angustifolia (narrow-leaved). A synonym of *Orphium frutescens*.

C. decussata (decussate). A synonym of *Orphium frutescens*.

C. frutescens (shrubby). A synonym of *Orphium frutescens*.

C. palustris (marsh-loving). *fl.* rose-red, numerous, in branching, leafy cymes; calyx ¼in. long; corolla nearly 2in. across, the segments obtuse. Summer. *l.*, radical ones densely tufted, 4in. to 5in. long, very narrow-spathulate, obtuse; cauline ones sessile, connate by their bases. Stem stout, 1ft. to 1½ft. high. (B. M. 7101.)

C. pedunculatis (long-pedunculate). *fl.* reddish-purple, 1¼in. across, borne on long pedicels; corolla tube terete, equalling the ovate, acuminate lobes. July to October. *l.* sessile, cordate or rounded at base, ovate-lanceolate, acute or acuminate, three-nerved. 1835 and 1887. Plant decumbent. (B. M. 7047; B. R. 1803.) SYN. *C. trinervis*, of gardens (P. M. B. iii. 149).

C. trinervis (three-nerved). An old garden name for *C. pedunculatis*.

CHLÆNACEÆ. A small natural order (eight species) of trees and shrubs, of botanical interest, confined to Madagascar, and ranking between *Dipterocarpeæ* and *Malvaceæ*.

CHLAMYDOSTYLIS. A synonym of **Nemastylis** (which *see*).

CHLAMYSPORUM. A synonym of **Thysanotus** (which *see*).

CHLIDANTHUS. SYN. *Coleophyllum*. This is a monotypic genus, the species being that described on p. 316, Vol. I.

CHLOIDIA. A synonym of **Corymbis** (which *see*).

CHLOÖPSIS. A synonym of **Ophiopogon** (which *see*).

CHLORITA VIRIDULA. *See* **Potato Insect Pests.**

CHLOROCODON (from *chloros*, green, and *kodon*, a bell; in allusion to the colour and shape of the flowers). Mundi-root. ORD. *Asclepiadeæ*. A monotypic genus. The species is a tall, leafy, warm-greenhouse climber, allied to *Periploca*. It thrives in any good soil, and is increased by cuttings of the ripened shoots, inserted in sand, under a bell-glass, in bottom-heat. The aromatic roots are extensively collected and sold by the native tribes, being used as a stomachic.

C. Whitei (A. S. White's). *fl.* pale green, between rotate and campanulate, ⅜in. across, the segments purple towards the base internally, where there is a thickened ring swelling into five notched lobes; cymes axillary, corymbose, many-flowered. August. *l.* opposite, shortly petiolate, 6in. to 10in. long, broadly oval-oblong, abruptly acuminate, cordate at base. Natal, 1869. (B. M. 5898; G. C. 1895, ii., p. 224; R. H. 1895, p. 375.)

CHLOROPHORA (from *chloros*, greenish, and *phoreo*, to bear; alluding to the economic properties of *C. tinctoria*). ORD. *Urticaceæ*. A genus comprising only two species of milky, stove trees; one is a native of tropical America, and the other is tropical African. Flowers dicœcious, the males in cylindrical spikes, the females in globose or oblong heads; inflorescences of both sexes shortly pedunculate, solitary in the axils. Leaves alternate, petiolate, entire or toothed, penniveined; stipules lateral, caducous. The following species thrives in almost any soil, and is readily propagated by cuttings of the half-ripened wood.

C. tinctoria (dyers'). Fustic-tree. *fl.*, male inflorescence 1¼in. to 2¾in. long; females ¼in. to ½in. in diameter; peduncles pubescent or puberulous. *l.* distichous, 2in. to 6in. long, 1¾in. to 2¾in. broad, ovate or ovate-elliptic, entire or toothed, rarely lobed; petioles ¼in. to ½in. long. *h.* 20ft. Tropical America, 1739. Yellow, brown, olive, and green dyes are extracted from the wood. SYN. *Maclura tinctoria*.

CHLOROPHYTUM. SYNS. *Asphodelopsis*, *Hartwegia* (of Nees), *Schidospermum*. The species are natives of Asia, tropical and South Africa, and America; they only differ from *Anthericum* in the capsule being acute-angled, and in the filaments being usually more or less dilated towards the middle. The following species call for description. For culture, *see* **Anthericum.**

C. arundinaceum (Reed-like). *fl.* white; perianth segments ¼in. to ⅓in. long; raceme 3in. to 8in. long, simple or shortly branched; scape stout, 6in. to 20in. long. *l.* oblanceolate, obtuse, acute, or acuminate, 6in. to 18in. long, 1¼in. to 2in. broad, usually narrowed into a broad petiole. Eastern Himalayas, 1876. Half-hardy.

C. brachystachyum (short-spiked). *fl.* white, small, in a dense raceme. *l.* Eucomis-like, 8in. long. Nyassaland, 1893. Stove.

C. elatum (tall). *fl.*, perianth whitish, ⅓in. long; racemes lax, ascending, 6in. to 12in. long; scape 3ft. to 4ft. long, including the inflorescence, which is copiously paniculate. *l.* twelve to twenty, lanceolate, firm, 1½ft. to 2ft. long, 1in. broad, with about thirty distinct ribs. South Africa. Greenhouse. (Ref. B. 216.)

C. e. variegatum (variegated). The correct name of *Anthericum variegatum*.

C. Kirkii (Kirk's). *fl.*, perianth white, greenish outside, ¼in. long; raceme lax, simple, 4in. to 5in. long; peduncle shorter than the leaves. Summer. *l.* about six to a stem, thin, lanceolate, 1½ft. long, ¼in. to 1in. broad. Mozambique, 1882. Stove.

C. rhizomatosum (rhizomatous). *fl.*, perianth ¼in. long, the segments white, with a brown keel; racemes two, lax, erect, 3in. to 4in. long; peduncle shorter than the leaves. August. *l.*, produced ones about six to a stem, firm, linear, acuminate, 6in. to 9in. long, ¼in. to ⅓in. broad, not petiolate. Rootstock vertical, ¼in. in diameter, bearing many surperposed relics of old leaves. Mozambique, 1885. Stove.

CHLOROSIS, or **BLANCHING**, is a disease found in many kinds of fruit-trees, as well as upon the Vine. As its second name suggests, it is characterised by a loss of colour in the foliage, which, instead of being green and healthy-looking, presents a yellowish, sickly appearance. In France the disease is very prevalent on Vines, especially

Chlorosis, or Blanching—*continued.*

those on soil containing lime. Though the leaves are most affected, the shoots in their vicinity also participate. The disease is to trees what anæmia is to the human subject. It is due to a lack of iron in the soil, and the remedy is therefore obvious, although it must be inferred that the disease sometimes entirely baffles the cultivator. Apricots, Peaches, and many other fruits are affected, as well as Cucumbers and their allies. So far as Vines are concerned, French growers have found it advantageous to change their stocks, using those which are found growing wild upon similar soils.

CHOCOLATE-NUT TREE. *See* **Theobroma Cacao.**

CHOCO-PLANT. *See* **Sechium edule.**

CHŒNOMELES, or CHÆNOMELES. A synonym of **Cydonia** (which *see*).

CHOIROMYCES ALBUS. *See* **Truffles.**

CHOISYA. *Juliana* is synonymous with this genus.

CHOKE-BERRY. *See* **Pyrus arbutifolia.**

CHOMELIA. Syn. *Anisomeris.* About a score species, natives of tropical America, are included in this genus.

CHOMELIA (of Linnæus). A synonym of **Webera** (which *see*).

CHONDRORHYNCHA. Colombia is the home of the few species included in this genus. Sepals sub-equal, narrow-oblong; petals much broader; lip articulated with the foot of the column, sessile, broad, erect, concave, undivided; pollen masses four. To the species described on p. 317, Vol. I., the following should be added:

C. bicolor (two-coloured). *fl.* white, with some purple markings on the middle and base of the lip; sepals 1in. long, the dorsal one ¼in. broad, the lateral ones ⅓in. broad; petals oblong, obtuse, ⅔in. long; lip nearly 1in. long, somewhat three-lobed; peduncles 2in. long, one-flowered. *l.* 1½ft. to 2ft. long, linear-lanceolate, acuminate. Costa Rica, 1894. Plant tufted.

C. fimbriata (fringed). The correct name of *Stenia fimbriata.*

C. Lendyana (Lendy's). *fl.*, sepals and petals whitish-yellow, the lateral sepals reverse and retrorse, the petals very large; lip darker than the sepals and petals, large, elliptic, with a central, bidentate callus. 1886.

CHONEMORPHA (from *chone*, a funnel, and *morpha*, a form; in allusion to the shape of the flowers). Ord. *Apocynaceæ.* A genus embracing about four species of tall-climbing, stove shrubs, natives of India and the Malayan Archipelago, and closely allied to *Trachelospermum.* Flowers white, rather large, in loose, branched cymes. Leaves opposite, ample. *C. macrophylla*, the only species introduced, thrives in a compost of sandy loam and peat, and may be increased by cuttings.

C. macrophylla (large-leaved). *fl.* sweet-scented; calyx ⅓in. long, tubular; corolla tube very short, hairy within, the throat 1½in. long, the limb 3in. broad. July. *l.* 10in. long and broad, opposite, orbicular to obovate, cuspidate, cuneate at base, pale and pubescent beneath. India, &c. 1884. (B. M. 7492.)

C. pubescens (downy). A synonym of *Holarrhena antidysenterica.*

CHORETIS. Included under **Hymenocallis** (which *see*).

CHORISIA (commemorative of J. L. Choris, an artist who accompanied Kotzebue round the world). Ord. *Malvaceæ.* A small genus (three species) of prickly, stove trees, found in tropical America. Flowers reddish, rather large; calyx cup-shaped, irregularly two- to five-lobed; staminal column five-toothed or five-cleft at apex; peduncles axillary or sub-racemose, with two or three bracteoles under the flowers. Leaves digitate; leaflets five to seven, entire or serrated. *C. speciosa*, the only species introduced, requires a rich, loamy soil. It may be propagated by seeds, sown in sandy soil, with bottom-heat.

C. speciosa (showy). *fl.* axillary, solitary, 3in. in diameter; calyx silky inside; petals yellowish, with dark brown rays on the densely pubescent back, oblong, spreading; stamens in a long tube surrounding the style. *l.* on long petioles; leaflets lanceolate, acute, serrated. Brazil, 1883. An ornamental tree.

CHORISTES. A synonym of **Deppea** (which *see*).

CHORIZEMA. About fifteen species, confined to Australia, are included in this genus. Flowers usually orange or red, in terminal racemes or rarely axillary; petals clawed; standard emarginate, rather longer than the oblong wings; keel much shorter than the wings. To the species, &c., described on p. 318, Vol. I., the following should be added:

C. cordatum. There is a variety *splendens.* 1883.

C. flavum (yellow). A synonym of *C. cordatum.* (G. M. B. i. 73.)

C. nervosum (nerved). *fl.* orange-crimson; standard about ¼in. long; racemes loose, few-flowered. Summer. *l.* broadly orbicular-cordate, pungent-pointed, much undulated, ¼in. long, often broader than long. *h.* 2ft. 1852. (L. J. F. 383.)

C. ovatum (ovate). A synonym of *C. rhombeum.* (B. R. 1523; P. M. B. iv. 153.)

C. rhombeum (of Loddiges). A synonym of *C. diversifolium.* (L. B. C. 1619.)

C. spartioides (Spartium-like). A synonym of *Isotropis striata.*

C. superbum (superb). A synonym of *C. cordatum.* (I. H. t. 29.)

CHOROZEMA. *See* **Chorizema.**

CHOTEKIA. A synonym of **Dysophylla** (which *see*).

CHRISTOPHER, HERB. *See* **Actæa spicata.**

Fig. 243. Chrysalidocarpus lutescens.

CHRYSALIDOCARPUS. Though somewhat rare in cultivation, *C. lutescens* is so elegant and decorative (see Fig. 243) that it should be included, if possible, in any select list of Palms.

CHRYSANTHEMUM. Including *Balsamita*, *Ismelia*, and *Leucanthemum.* Nearly 120 species have been referred to this genus, but not more than eighty are distinct as such; they are found in Europe, Asia (mostly temperate and North), America (mostly North), North and South Africa, and the Canary Islands. *C. Leucanthemum* (Ox-eye Daisy), *C. segetum* (Corn Marigold), and *C. Parthenium* (Feverfew Chrysanthemum) are well-known British representatives.

Not one of the Japanese sorts grown twenty years ago is met with now for exhibition or for any other purpose, and their names have practically disappeared

Chrysanthemum—*continued.*

from even Chrysanthemum specialists' catalogues. With the Incurved section, very few indeed of those most valued a quarter of a century ago are now considered worth cultivating. In the Anemone section there has likewise been the same advance; while the Early-flowering varieties, of which there is such a magnificent selection, were practically unknown. The same also applies to the Single and the Hirsute varieties, the single sorts in many instances being very pretty and most useful for cutting. In the Pompone and Reflexed sections there is the least advance, and it is a question if the last-named will ever become favourites. The thing to be regretted in connection with the exhibition Chrysanthemum is the tendency to coarseness in the flowers.

LATE-FLOWERING VARIETIES. Many growers plant out all their varieties with a view to increase or improve their stamina, and thus obtain better cuttings than those taken from pampered pot plants. A still better plan is to procure cuttings from a distance, where the conditions as regards soil and situation are totally different. Plants raised from these cuttings almost invariably produce far superior flowers to those obtained from home-grown ones.

When cuttings are received somewhat limp, they should be placed in lukewarm water for an hour; this will freshen them up and make them in good condition for potting. In November, or as early in December as the cuttings become large enough, take those growths that spring from the soil (not those on the stem, unless the stock is short), selecting those that are short, sturdy, and with good foliage. Carefully cut away the two lower leaves and insert the cuttings at once singly in small "sixties." These should be well drained and filled with a compost of leaf-mould and loam in equal proportions, with sufficient sand added to make the whole porous. Immediately after the cuttings are put in a thorough soaking should be given to settle the soil about them, and also to prevent the foliage from drooping. A low pit or frame, with a hot-water pipe round, is an excellent place to stand them, maintaining a temperature of 45deg., and keeping the place closed until the cuttings have rooted. If air is admitted by ventilation before the rooting process is completed, the foliage will be sure to flag. If the sun comes out brightly, lightly damp the foliage overhead with a syringe; this tends to keep the leaves plump.

The process of rooting varies considerably. Some varieties make roots very quickly, while others are very slow. Those that strike first should be removed to a cooler and more airy position, but safe from frost. The plants should be kept close to the glass to obtain all the light possible and induce a sturdy habit; unless this is done, particularly while the days are short, the plants become drawn and weakly. The plants should never suffer from lack of water from the time of their insertion as cuttings until after they have flowered. At the same time, continued saturation must be avoided.

By the end of March the cuttings will have filled their pots with roots, and should be potted into 5in. size, draining carefully, and covering the drainage with moss, to keep it free. At this potting the compost should consist of three parts good fibrous loam and one part well-decayed leaf-mould or spent horse-droppings, with a 5in. potful of fine bone-meal to every barrow-load of soil, thoroughly mixing the whole. If the loam is of a very heavy character, a little silver-sand may be added; but it is advisable not to make the soil too light. Press the soil moderately firm, and leave a space about ½in. deep at the top of the pot for water. If the plants are watered well a little time before potting, it will not be necessary to water them again for a day or so. When it is necessary, give a good soaking, using a fine rose on the pot in order to avoid displacement of the soil.

After potting, a cold frame, with the floor covered with coal-ashes, is the most suitable place for the plants, but still keeping them close to the glass, and also somewhat close for a few days, until the roots have started taking possession of the new soil. Afterwards air may be admitted freely on warm or sunny days; in fact, when the weather is very mild the lights may with advantage be taken right off. Any attempt at coddling will end in leggy plants, with no foliage at their base. Towards the end of April the lights may be left off the frames entirely, except in very cold weather, and by the middle of May the plants may be stood outside in an open, sunny position. By the end of May or early in June the plants may be transferred to their flowering pots. If required for exhibition, 8in. pots will be quite large enough; but if extra large plants are required

Chrysanthemum—*continued.*

for quantities of cut blossoms or conservatory decoration, 10in. or even larger-sized pots may be employed. The compost at this final potting should consist of three parts rich fibrous loam and one part dry horse-droppings, with a 7in. potful of bone-meal to each large barrow-load of soil; or failing bone-meal a similar quantity of Thomson's Manure may be used instead. The drainage of the pots ought to be carefully arranged (inverted oyster-shells are first-rate) and covered with moss, while a sprinkling of soot will keep out worms for a considerable period. The soil should be rammed moderately hard, and must not fill the pot. A space of 2in. or 3in. at the top should be allowed for a top-dressing later on.

From this time onwards, the plants will demand constant attention in watering, staking, and tying, and ample space should be provided for each plant. A very good position for them is by the side of a sunny walk, in a single line. By having stakes driven in at intervals, with stout string running from each other, the plants may be securely tied thereto, and thus prevented from being blown down or injured by strong winds, while the sun and light have full play upon both sides of the plants, ensuring thorough ripening of the wood. Some growers advise giving no liquid or other manures until the flower-buds have formed, but a little weak liquid manure, or a top-dressing of soot or soot-water, certainly improves the health and colour of the growth. Immediately the flower-buds are formed, a mulch of fibrous loam and decayed manure, in equal proportions, will prove highly beneficial, and from the time of the flower-bud formation until the flowers begin to expand frequent applications of diluted liquid manure, or some of the prepared chemical manures, will be very serviceable, bearing in mind that the roots can only take up or use a limited amount of plant-food, and any great excess above their requirements is likely to do more harm than good.

Stopping, bud-taking, &c., are comparatively simple matters, and depend a great deal upon the purpose for which the plants are grown. If for exhibition blossoms, it will be found advisable not to pinch or stop the shoots at all, but at each break to select from three to five of the strongest and best shoots, and rub out all the others. About the middle of August, or from then to early in September, these growths form buds (termed crown buds), and all except the centre or largest bud are pinched out. If these buds form in July or very early in August, they are too early for exhibition in November; consequently, they are taken out, and another shoot is made, which produces a "terminal," or second crown bud.

Between these crown and terminal buds there is a great difference; in many cases the colour is quite distinct on the same plant, as may be proved by allowing one shoot to produce a crown, and one a terminal bud. For this reason, some varieties are best from one, and some from the other. In describing the sorts for exhibition, it will be noticed that it is stated which is the best bud to choose. If possible, the buds should all be secured by the end of August. Very fine blossoms are obtained from buds formed early in September, but there is always a risk of their not being in time, and also a doubt as to their proving up to the exhibition standard. Immediately the buds are formed, it is advisable to lightly spray the plants with Bordeaux Mixture to prevent Mildew or other fungoid attacks.

At the end of September or early in October, the plants may be placed in a cool, light, airy house, where a little fire heat may be turned on to expel damp, especially in dull or foggy weather. Plenty of ventilation should be given whenever the weather is favourable, and any needless spilling of water about the house ought to be avoided, otherwise it will be apt to cause the flowers to "damp." While the blossoms are expanding it will be necessary to pull out a few of the petals, as some are almost sure to be awkward or out of place, and would, if allowed to remain, spoil the symmetry of a blossom.

When fully developed, an Incurved flower should be deep, full in the centre, towards which all the petals should incurve, and be also fresh and of good colour. The Japanese section should have all their flowers deep, wide, with good petals, and well coloured. The same applies in a lesser degree to the Reflexed; while the Anemone section ought to have the centre, or cushion, well developed, free from petals, and the outer florets or guard-petals in a well-formed circle round the cushion.

The dressing of flowers for exhibition is extensively practised by Chrysanthemum growers, and consists in the

Chrysanthemum—*continued.*

early removal of all malformed or useless petals. For instance, in an Incurved blossom some of the petals are ill-formed or twisted, and if allowed to remain would spoil an otherwise good flower; and the same applies to the Anemone section. Ivory tweezers and a fine small brush are employed to curl and fix the petals in a correct and symmetrical form. With a little practice on spare flowers it will not be found difficult to arrange the petals properly and thus improve the appearance of the flowers, although perhaps a little reducing them in size.

In arranging the blossoms on the exhibition-boards (Fig. 244), the finest or largest flowers should be at the back, the colours so arranged as to give the best effect, and the blossoms raised sufficiently to show their depth and true character. Good taste, neatness, and punctuality in staging, are quite as requisite to the man who would become a successful exhibitor as fine flowers.

For the supply of cut flowers, or for plants intended only for decorative purposes, the details of culture are a little different from those which obtain when dealing with plants for exhibition. To furnish flowers in November, the cuttings should be "struck" or rooted as advised in November; but for flowers at Christmas and the New Year, January is soon

Chrysanthemum—*continued.*

frame, in the compost already described. Immediately it is observed that the cuttings have rooted, ventilation should be given gradually, and the plants kept strong and short-jointed, pinching out all side-shoots as they appear, and only permitting one stem to grow. When the cutting-pot is well filled with roots, a shift into a 5in. or 6in. pot should be given; in this the plant should flower. By confining the growth to one stem, a short, strong plant, about 1ft. high, and with one large, well-coloured flower at the top, will be the result. These little plants are very useful for room-decoration, as they fit very well into vases, and continue fresh for a week or longer. More than one flower-bud will form, but all except the largest and best buds should be removed.

By sowing seed there is always a chance of raising new varieties equal to, and sometimes distinct from, existing varieties. Most of the leading seedsmen now advertise seed for sale. The best time to sow is in January or February, placing it in gentle heat to germinate, and afterwards keeping the seedlings close to the glass. Potting should be done as often as necessary, until finally the plants are in 7in. or 8in. pots, in which they should flower. It is always advisable to pot all the seedlings, however weak and

FIG. 244. EXHIBITION CHRYSANTHEMUM BLOSSOMS ARRANGED ON A BOARD.

enough to put in cuttings, growing them on sturdily as previously suggested, and also potting them similarly; but, instead of waiting for the plants to branch out naturally, it is advisable to pinch out points of the shoots several times to obtain dwarf and bushy specimens. All stopping or pinching of the shoots should, however, cease by the end of July. Proper attention to staking must be paid; and when the plants form their flower-buds in September, it is wise to cut away all the buds except three or four on each shoot. If all the buds were left, the lower ones on each shoot would fail to open except in the case of the Pompones; with these all the buds should be retained. It will be found that this early removal of useless buds greatly improves the quality of the flowers, making them more valuable for home use or for market.

The remarks already made on feeding, mulching, and spraying with a fungicide are applicable to bush-plants; in fact, to grow any Chrysanthemum thoroughly well, freedom from insect or fungoid pests and generous treatment are absolutely essential. In pinching or taking out the tops of the Japanese varieties in April or May, it is well to cut the shoots back 2in. or 3in. These points make splendid cuttings, and will root readily if placed in a cool close

delicate they may appear, as there is often the very best amongst the weakest, and to throw such away as worthless might be the means of discarding the only good variety in the whole batch. On the other hand, equally as satisfactory varieties occasionally originate from strong and moderately strong-growing varieties, showing the uncertainty of pinning faith to either strong or weak ones as the most likely to produce anything specially noteworthy. As a rule, the blossoms the first year are very disappointing, the major portion of the flowers coming single and semi-double, and a novice would probably throw them all away; this is a mistake to be avoided, for out of a large quantity raised from seed we have never found a really good flower the first year. The better plan is to carefully select those combining good colour and width of flower with the largest number of petals or florets, and from such take cuttings in November, growing them on in the usual manner. If any of them are of merit, they will show their true character in the second year, and the grower can decide if they are worth retaining.

To the species and varieties described on pp. 318-24, Vol. I., the following should be added. Except where otherwise stated, the species are hardy perennials. *See also* **Pyrethrum.**

Chrysanthemum—*continued.*

C. arcticum (Arctic). *fl.-heads* white, tinged with lilac or rose; ray florets nearly 1in. long; pappus none; involucral bracts brown-margined. Summer. *l.* cuneate, with a long-tapering base or petiole, crenately toothed or incised at the summit; uppermost ones small, nearly entire. *h.* 9in. to 12in. Arctic Alaska, Japan, &c., 1801. A useful plant for the rockery. (R. G. 785.)

FIG. 245. FLOWER OF CHRYSANTHEMUM EDITH TABOR.

C. Broussonetii (Broussonet's). *fl.-heads* 3in. across; ray florets pale lilac, tinged with yellow at base; disk dark purple, changing to golden-yellow; peduncles elongated. May. *l.* distant, ovate or obovate, pinnatifid; segments lanceolate, often again pinnatifid and toothed. *h.* 2ft. to 3ft. Canary Islands, 1858. SYN. *Ismelia Broussonetii* (B. M. 5067).

C. cinerariæfolium (Cineraria-leaved). *fl.-heads* 1½in. in diameter; involucral bracts rounded and whitish at apex; ray florets white, tridentate; disk yellow. July and August. *l.* pinnatisect; segments narrow-elongated, few-lobed, pinnatifid or pinnatisect, spreading. Stem erect, slender, one-headed. Dalmatia. (B. M. 6781.)

C. grandiflorum (large-flowered). *fl.-heads* yellow, 1in. across. *l.* serrated; radical ones obovate; cauline ones lanceolate, sessile, inciso-serrated. Stems simple, one-headed, hairy. Algeria, 1884. Biennial. SYN. *Balsamita grandiflora.*

C. hæmatomma (red-eyed). *fl.-heads* rose-coloured, 3½in. to 4in. across, borne in great profusion in its native country; but the plant is described as "of too straggling a habit for it to become a favourite pot plant." Madeira, 1888. Half-hardy.

C. indicum (Indian). The plant from which the numerous garden varieties have sprung, and which is now only seen in those forms. It is closely allied to *C. sinense.* SYNS. *C. japonicum, C. tripartitum.*

C. inodorum (scentless). A synonym of *Matricaria inodora.*

C. japonicum (Japanese). A synonym of *C. indicum.*

C. lacustre (lake-loving).* *fl.-heads* white, numerous. Autumn. *l.* broader and more fleshy than in *C. maximum* (with which this species has been confused), not so much narrowed at base, and more regularly toothed. Portugal. (G. C. 1889, v., p. 589, f. 100.)

C. maximum (greatest). *fl.-heads* white, solitary; involucral scales oblong, whitish; whitish-margined at apex; ray florets about 2in. long. *l.*, lower ones petiolate, cuneate at base, lanceolate, toothed from the middle to the apex; cauline ones sessile, broadly linear-lanceolate, serrated. Stem ascending, erect, simple or somewhat branched towards the base. *h.* sometimes 10ft. Pyrenees. (G. C. n. s., xxvi., p. 273.)

C. multicaule (many-stemmed). *fl.-heads* golden-yellow, solitary at the ends of the stems or branches, 1½in. to 2½in. in diameter;

Chrysanthemum—*continued.*

ray florets twelve to twenty, broadly oblong, obscurely crenate at the tip. July and August. *l.* succulent, very variable, linear-spathulate, trisected or pinnatifid. Stems many, terete, simple or branched, 6in. to 12in. high. Algeria, 1887. A glaucous, hardy annual. (B. M. 6930.)

C. nipponicum (Nippon). *fl.* resembling Marguerites, 2½in. to 3½in. across, having numerous white rays and a yellow disk. *l.* coriaceous, dark green, oblong-spathulate, 3½in. long, the margins irregularly denticulate. China, 1895. This species is distinguished from its herbaceous congeners in having shrubby stems, attaining 1½ft. in height. It has been described as "a dwarf, compact, shrubby Ox-eye Daisy."

C. serotinum (late). *See* **Pyrethrum uliginosum.**

C. tripartitum (three-parted). A synonym of *C. indicum.*

C. Zawadskii (Zawadski's). *fl.-heads* rose-tinted, numerous; involucral scales ciliated. *l.* pinnatifid. Stems sub-shrubby, corymbose, pubescent above. Galicia, &c. Habit tufted.

Japanese. From careful observations made, it seems that about ten years is the life of an exhibition variety in the Japanese class. In fact, it must be a very good variety indeed to stand as long as that on the show table. With all other classes it is more difficult to raise new varieties of such merit as will entitle them to a place on the exhibition stands; consequently, they retain their hold upon the public for a much longer period. The following are splendid varieties for exhibition:

ANNIE PREVOST, pure white, with incurving florets; the plant has a strong dwarf habit, height 3ft.; AUSTRALIE, soft amaranth, florets broad and long, a grand exhibition variety, crown bud; BEAUTY OF ADELAIDE, mauve-pink, florets long and deep, crown bud; BEAUTY OF THRUMPTON, rich rosy-purple, with reflexed florets, flowers of large size and good form, height 4½ft.; BELLUM, clear pink, florets incurving, very handsome, terminal bud; BOULE D'OR, beautiful straw colour, florets

FIG. 246. FLOWERS OF CHRYSANTHEMUM GOLDEN SHOWER.

broad, deep, and incurved, crown bud; CHARLES DAVIS, bronzy-buff shade, a grand flower, with long, straight florets, crown bud; C. B. HAYWOOD, white, long, stiff florets, immense flower, crown or terminal buds; C. HARMAN PAYNE, dark purple, florets

Chrysanthemum—*continued.*

FIG. 247. FLOWER OF CHRYSANTHEMUM MR. A. G. HUBBUCK.

long and somewhat coarse, enormous flower from a crown bud; C. W. RICHARDSON, lovely yellow, florets long and beautifully curled, terminal bud; DAKOTA, deep yellow, the florets being mixed up together in a most attractive form, height 5ft.; DUKE OF WELLINGTON, salmon-buff, florets long and very broad, splendid terminal bud; EDITH DASHWOOD, delicate pink or rose, with very long florets, which are gracefully twisted, a very pretty, large variety, height 5ft.; EDITH TABOR (Fig. 245), lemon-yellow, florets long, broad, and deep, crown bud; EDWIN MOLYNEUX, rich deep crimson, with golden reverse, one of the finest varieties when well grown, crown bud; EMILY TOWERS, rosy-pink, with a silver centre to the florets, which are beautifully twisted, forming a deep fine flower, height 4ft.; ERNEST CANNELL, deep fawn, florets deep, broad, and incurved, very fine, crown bud; ETOILE DE LYON, lilac-rose, florets long, broad, and reflexed, enormous flower, crown or terminal bud, though usually the best colour is found on the terminal bud; FLORENCE DAVIS, white, with green centre, fine form, crown bud; GEORGE FOSTER, rich golden-yellow, florets broad and slightly twisted as they incurve, height 4½ft.; GOLDEN SHOWER (Fig. 246), fiery yellow, florets long, narrow, and drooping, flowers small, but valuable for decoration, height 5½ft.; GRAPHIC, rosy-mauve, florets twisted and incurving, terminal bud; HENRY WEEKS, bright rich crimson, florets broad, a grand flower, height 4ft.; HERBERT J. CUTBUSH, deep red, marked with yellow, a good front row flower, crown bud; H. J. JONES, intense crimson, florets flat, broad, and handsome, height 4½ft.; JOHN POCKETT, a mixture of rich crimson and bright bronze, a deep and beautiful flower, height 4ft.; JOSEPH CHAMBERLAIN, very rich crimson, with a golden reverse to the broad florets, a seedling from E. MOLYNEUX, with a better habit and finer flower than its parent, height 4½ft.; JULIA SCARAMANZA, bronzy terra-cotta, florets long and deep, crown bud; KING OF BUFFS, salmon-buff, very large, and of good form and substance, crown bud; LADY CRAWSHAW, white, faintly shaded with pink, the florets being beautifully twisted, height 5ft.; LADY E. CLARKE, pure white sport from MRS. C. HARMAN PAYNE, and, like its parent, of large size, height 5½ft.; LADY

Chrysanthemum—*continued.*

HANHAM, golden rosy-cerise, a splendid variety, crown bud; LITTLE NELL, pure white, florets broad and deep, a fine acquisition, height 5ft.; MADAME CARNOT, pure white, very large, one of the best, crown bud; MR. A. G. HUBBUCK (Fig. 247), chestnut-red, with gold reverse, very fine, crown bud; MDLLE. THERESE REY, ivory-white, splendid when well grown, crown bud; MRS. H. WEEKS (Fig. 248), pure white, suffused with pink, a large fine flower, height 7ft., crown bud, a late variety; MRS. G. W. PALMER, deep bronze, immense flower, with broad florets, crown bud; MRS. HERMANN KLOSS, deep orange, almost bronze, very large, crown bud; MRS. C. E. SHEA, creamy-white, florets curled and twisted, very fine, crown bud; MRS. J. BEGGS, soft pink, a deep, massive new variety, of great promise, crown bud; MRS. W. H. LEES, white, tinged with pink, a deep and imposing flower, crown bud; MRS. COOMBES, rosy-mauve, florets long and drooping, an immense flower that should prove valuable for exhibition, height 4½ft.; M. CHENON DE LECHE, deep rose, florets long and drooping, extra good, crown bud; MRS. RITSON, a magnificent pure white sport from VIVIAND MOREL, this variety promises to be constant in character, height 4ft.; MRS. W. MEASE, a sulphur-yellow sport from MADAME CARNOT, height 4½ft.; MRS. WHITE POPHAM, white, shaded with carmine, florets long, drooping, and handsomely twisted, height 5ft.; MONS. PANKOUCKE (Fig. 249), clear yellow, a large deep flower, height 4ft., crown bud; MOOR PARK, golden-buff, marked with crimson, a deep flower, with long twisted florets, height 4½ft.; MONS. FATYER, soft yellow, very large and handsome, height 4½ft.; NELLIE POCKETT, creamy white, florets long, rather narrow, and twisted, a deep and lovely flower, height 5ft.; NINA DABBS, deep yellow, slightly shaded with green, florets broad and spreading, a large and deep flower, height 5ft.; NIVEUS, probably the purest white, a lovely flower, of good size, crown bud; NYANZA, dark crimson, florets incurved, must be well grown, crown bud; OLIVE OCLEE, rich deep bronze, florets incurved, good on crown or terminal buds; OWEN'S MEMORIAL, rich crimson-red, florets broad, drooping, and slightly twisted, very large, height 4ft.; PONDEROSUM, white,

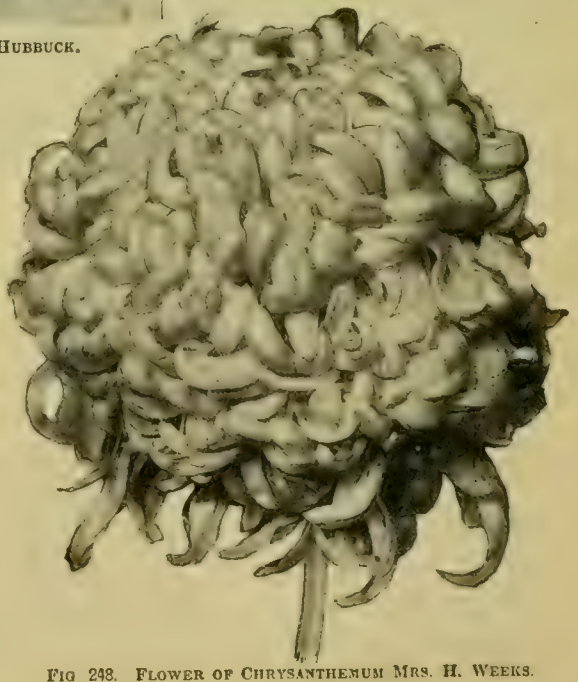

FIG 248. FLOWER OF CHRYSANTHEMUM MRS. H. WEEKS.

FIG. 249. FLOWER OF CHRYSANTHEMUM MONS. PANKOUCKE.

FIG. 250. FLOWER OF CHRYSANTHEMUM WHAT HO!

flowers of immense width and depth, terminal bud; PHŒBUS, a charming yellow, florets long and reflexed, crown bud; PRIDE OF MADFORD, crimson-cerise, a beautifully-formed flower, crown bud; R. HOOPER PEARSON, one of the best of all the yellow varieties, and of dwarf, sturdy habit in growth, a decided acquisition, height 3ft.; R. J. UPTON, canary-yellow, florets long and flat, large and distinct, height 5ft.; ROYAL STANDARD, deep crimson, flower of fine substance, very promising, crown bud; SNOWDON, pure white, of great size and beauty, crown bud; SWANLEY GIANT, lilac-pink, florets incurving, massive, crown bud; VICAR OF BRAY, crimson, shading to orange, very fine, crown bud; VIVIAND MOREL, blush-mauve, an indispensable variety, crown or terminal buds; WHAT HO! (Fig. 250), a semi-double flower of most curious form, the creamy-white florets of great length, that twist towards the points, height 5½ft.; YELLOW MADAME CARNOT, this has all the excellent qualities of the white form, crown bud.

FIG. 251. CHRYSANTHEMUM ETOILE DE LYON.

Some of the foregoing varieties being only suitable for providing very large exhibition blossoms, the following are named as excellent for supplying medium-sized flowers, most useful for cutting or decorative purposes. A lengthy description is unnecessary, and only the habit and colour of flower of each variety are given.

ANNIE CLIBRAN, pink, medium height; BOUQUET DE DAME, pure white, dwarf; ELAINE, pure white, medium height, early; ETOILE DE LYON (Fig. 251), lilac-rose, medium height; FLORENCE PERCY, white, medium height; GASPARD BOUCHARLAT, deep orange, medium height; GOLDEN DART, buttercup-yellow, dwarf, very late; KING OF PLUMES, deep yellow, medium height; LADY SELBORNE, white, medium height, early; L. CANNING, pure white, dwarf, very late; MADAME WALKER, rosy-mauve, rather tall, flowers quilled; MARGOT (Fig. 252), blush white,

FIG. 252. CHRYSANTHEMUM MARGOT.

dwarf habit; MDLLE. LACROIX, white, medium height, a favourite; M. FREEMAN, rosy-pink, dwarf; MR. CHAS. E. SHEA, yellow spot from MDLLE. LACROIX; OWEN'S BRILLIANT, deep crimson, medium height; ROSEUM SUPERBUM, salmon-pink, tall; SOURCE D'OR, deep bronze, medium height; W. HOLMES, deep crimson, dwarf; W. ROBINSON, salmon-orange, tall.

Hirsute. The Hirsute or Hairy Chrysanthemum has evidently come to stay. The following are all distinct varieties, and the plants of vigorous habit:

ABBE PIERRA ARTHUR, pure white, petals long and usually drooping, a fine large flower; BELLE DES GORDES, rich rosy-red, florets nicely incurved, fine; CAPTAIN L. CHAURE, yellow, florets incurved, a large massive flower; ESAU, salmon-blush, shading to yellow, a pretty variety; GOLD DUST, golden-yellow, florets incurved, a very pleasing flower, plants dwarf; GOLDEN HAIR, golden-yellow, the florets being very hairy; HAIRY WONDER (Fig. 253), reddish-bronze, the most massive and best hirsute variety; LOUIS BOEHMER, a shade of purplish-pink, very hairy, good habit; MADAME M. MARCHANT, rosy-pink, large flower, and plant of sturdy habit; M. FERNAND BERTIN, white, shading to red, a large, bold flower; MIDNIGHT, bronze, flower very large and very hairy; MRS. C. B. FREEMAN, golden-yellow sport from LOUIS BOEHMER; MRS. W. J. GODFREY, probably the best white hirsute variety, good habit; SOUVENIR DE L'AMI COYE, white, of good size, and dwarf sturdy habit.

Singles. These are particularly serviceable for cut flowers, being light, graceful, and remarkably free-flowering. A few varieties should be grown in every garden. Their culture is identical with that already described for bush plants. It may be stated that the Single Chrysanthemum flowers usually continue fresh longer than the other sections, and damping of the flowers very rarely occurs, even in bad weather. The following varieties may be recommended:

ALICE, white, with yellow disk, large; ANNIE HEARD, white, yellow disk, dwarf; DOLLY VARDEN, rosy-pink, flowers small, and produced in great clusters, very dwarf; DOROTHY WOODERSON, soft pink, large; D. WINDSOR, chestnut, large and fine; EMILY WELLS, lovely clear pink, very pretty, rather small; EUCHARIS, pure white, large beautiful flower, very dwarf; FRAMFIELD BEAUTY, deep crimson, extra good; GOLDEN STAR, pure yellow, large and excellent; KATE HAWTHORN, one of the finest yellows, splendid; MARY ANDERSON, white, tinged with pink, small and pretty; MISS ROSE, soft pink, small and lovely; MRS. A. E. STUBBS (Fig. 254), pure white, of fine form and great beauty, height 3ft.; REV. W. E. REMFREY, deep crimson, excellent; TERRA COTTA, terra-cotta, dwarf, and very free.

Incurved. Except for purposes of exhibition, these beautiful, though somewhat formal-shaped, flowers are losing ground; in fact, the Japanese have almost ousted the

Incurved from many gardens. Though it must be admitted that the less formal Japanese class are the more beautiful, it is more difficult to grow a really deep, well-formed flower of an Incurved variety than it is to produce a fine Japanese blossom. Not only is considerable cultural skill requisite, but a knowledge of dressing or petal manipulation is essential to have Incurved blossoms sufficiently good in character to put on the exhibition table successfully. In the list of varieties only those suitable for show purposes are named, with the bud that usually gives the best flower:

ALFRED SALTER, lilac, a deep, well-formed flower, must be grown strongly, crown bud; AUSTIN CANNELL, purple-maroon, large, and of good form, crown bud; BARON HIRSCH, chestnut-red, a well-formed, large flower, crown bud; BONNIE DUNDEE (Fig. 255), beautiful orange shade, a perfect flower when well grown, terminal bud; C. B. WHITNALL, purple, fine form, the crown bud should be selected early in August; CHAS. H. CURTIS, rich yellow, extra good and indispensable, crown or terminal buds; D. B. CRANE, bronze-buff, deep flower, of good form, terminal bud; DUCHESS OF FIFE, white, a splendid new variety, full of promise, crown bud; EMPRESS OF INDIA, pure white, a magnificent flower, but must be grown well, crown bud; GEORGE HAIGH, carmine-rose, shaded with yellow, deep flower, of good shape, crown bud; J. AGATE, pure white, deep flower, of splendid form, crown bud; JEANNE D'ARC, white, tipped with purple, a deep flower, of medium size, crown bud; JOHN FULFORD, reddish-crimson, a large flower, of good form, terminal bud; JOHN LAMBERT, pale buff, a deep and fine flower, must be grown strong, crown bud; LORD ALCESTER, pale primrose, splendid flower if grown strong, crown bud; LORD ROSEBERY, mauve, large and telling flower, terminal bud; LORD WOLSELEY, bronzy-red, a deep,

FIG. 253. FLOWER OF CHRYSANTHEMUM HAIRY WONDER.

Chrysanthemum—*continued.*

FIG. 254. CHRYSANTHEMUM MRS. A. E. STUBBS.

Chrysanthemum—*continued.*

well-shaped flower, terminal or crown buds; LUCY KENDALL, coral-red, a pretty, well-formed flower, crown bud; LYNE, JUN., golden-bronze, of good form, crown bud; MADAME DARIER, nankeen yellow, extra good shape and size, crown bud; MAJOR BONNAFFON, much in the same form and colour as CHAS. H. CURTIS, and by many is considered synonymous, crown or terminal buds; MISS M. A. HAGGAS, primrose, a lovely deep flower, crown bud; MR. JAMES MURRAY, bright pink, a fine new variety, of good substance, terminal bud; MRS. F. W. FLIGHT, white, a deep massive flower, well incurved, crown bud; MRS. HEALE, white, a medium-sized and perfect flower, crown bud; MRS. R. C. KINGSTON, soft pink or mauve, blossoms of large size, crown bud; PRINCE ALFRED, rosy-carmine, an old variety still worth growing, crown bud; PRINCESS OF WALES, blush, only good when well grown, then it is fine, crown bud; QUEEN OF ENGLAND, blush, a splendid flower when strongly grown, crown bud; ROBERT CANNELL, deep bronzy-red, very fine form, crown buds, late; ROBERT PETFIELD, silvery-mauve, large flower, well incurved, terminal bud; SIR TREVOR LAWRENCE, pure white, a massive flower, of good shape, crown bud; THE EGYPTIAN, deep red, very large, a new variety of promise; WILLIAM TUNNINGTON, reddish-chestnut, must be grown strong, terminal bud.

Reflexed. The true Reflexed Chrysanthemum has usually a moderately large flower, with the florets or petals straight and reflexing towards their points. It is neither so ornamental nor so useful as most of the other classes; and although some of the varieties are well adapted for making a display in the conservatory, they are not much admired. Only those varieties suitable for developing nice sturdy plants, with a floriferous habit, are mentioned. If four buds are retained at the point of each shoot, and all the others are removed, the plant will make a very good display for several weeks.

BOULE DE NEIGE, pure white, valuable for its late flowering; CHEVALIER DOMAGE, deep yellow, a well-known old favourite; CLARA JEAL, pure white, a new and very pleasing variety; CULLINGFORDII, crimson-scarlet, should be grown for its freedom and fine colour; DOROTHY OXBERRY, soft pink, a pleasing colour; FELICITY, creamy-white, wonderfully free-flowering and of good habit;

FIG. 255. FLOWER OF CHRYSANTHEMUM BONNIE DUNDEE.

FIG. 256. FLOWER OF CHRYSANTHEMUM GOLDEN CHRISTINE.

Chrysanthemum—*continued.*

GOLDEN CHRISTINE (Fig. 256), golden-buff, a well-known old favourite, formerly much grown; KING OF CRIMSONS, rich dark crimson, dwarf habit; MISS FLORENCE LUNN, light amaranth, flowers large and very full; PHIDIAS, rose-blush, dwarf, and an abundant blossomer; PROGNE, amaranth, violet-scented, small flower, very free; the WHITE, PINK, and PEACH CHRISTINE varieties are all three well worth growing, being of dwarf habit and free flowering (see Fig. 257).

FIG. 257. FLOWER OF CHRYSANTHEMUM PINK CHRISTINE.

Anemones. These may be divided into three sections—Japanese, Large, and Pompones, the first being the most admired, and also the most extensively cultivated. To have very fine flowers of the first two sections the plants should be carefully disbudded, leaving only one bud to each shoot; but with the Pompone class no disbudding is

FIG. 258. FLOWER OF CHRYSANTHEMUM ROBIN ADAIR.

Chrysanthemum—*continued.*

FIG. 259. FLOWER OF CHRYSANTHEMUM DELAWARE.

either necessary or desirable. The plants of these latter should be pinched or stopped several times during growth to induce a bushy habit, to be covered later with a mass of small flowers.

Japanese. BELINDA, disk rose, guard-petals dark crimson; CINDERELLA, pure white; DUCHESS OF WESTMINSTER, disk pinkish-bronze, guard-petals blush; FABIAN DE MEDIANA, disk

FIG. 260. FLOWER OF CHRYSANTHEMUM MRS. JUDGE BENEDICT.

Chrysanthemum—*continued.*

purple, guard-petals lilac; JAMES WESTON, white; JEANNE MARTY, blush-white, a very fine full flower; MABEL MILLER, white, large and excellent; MADAME CLOS, disk white, guard-petals rose; MARSIA JONES, one of the finest whites; MR. HUGH H. GARDINER, deep rose, very fine; RIDER HAGGARD, deep rose and pink, the largest Japanese Anemone; ROBIN ADAIR (Fig. 258), blush-white, tinged with lilac, an extra good variety; SOUVENIR DE MADAME BLANDINERIES, a handsome crimson; TAM O' SHANTER, rosy-lilac, a splendid flower; W. W. ASTOR, salmon-blush, one of the best.

Large. DELAWARE (Fig. 259), white, very large handsome flowers; DESCARTES, crimson, with very prominent disk, a fine variety; EMPEROR, blush, with paler centre or disk, large and good; EMPRESS, blush, disk lilac, prominent, and of good form; GEO. HAWKINS, a lovely golden-yellow; GLUCK, golden-yellow, a well-known old variety; LADY MARGARET, pure white, of fine shape, a tall grower; MADAME ROBERT OWEN, pure white, large and excellent, dwarf habit; MISS ANNIE LOW, a yellow LADY MARGARET; MISS CATERER, pure white, of splendid form and habit; MRS. C. J. SALTER, buff-orange, pretty and effective; MRS. JUDGE BENEDICT (Fig. 260), pale flesh, with a prominent lemon disk, an excellent variety, height 3ft.; NOUVELLE ALVEOLE, a shade of blush-lilac, fine flowers; ROBIN ADAIR, blush, with a good disk, fine flowers, height 4ft.; STONEACRE GEM, yellow, shading to red, excellent.

Pompones. ASTARTE, amber and gold, dwarf; CALLIOPE, ruby-red, very striking flower; EMILY ROWBOTTOM, creamy-white, fine; ERIC, deep orange-buff; MADAME MONTELS, white, yellow disk; MAGENTA KING, magenta, yellow disk; MR. ASTIE, golden-yellow, dwarf; PERLE, rosy-lilac; REINE DES ANEMONES, white, fine for cutting; VIRGINALE, white, rather large flower, valuable for its lateness.

Pompones. This class, with its small flowers borne in great profusion, should find a place in every garden where Chrysanthemums are grown; for not only are the plants of dwarf habit, and covered with blossom, but the flowers, being small, can be employed for purposes for which the large-flowered classes would be useless. A few of the best of this pretty section are as follow:

AURORE BOREALE, bronze-orange; BOB, very dark crimson; CEDO NULLI, white, golden, and lilac, three very fine varieties; COMTE DE MORNY, bright purple; FLORENCE CARR, deep bronze; HARRY HICKS, soft pink; LA PURITE, pure white, very useful for wreaths, &c.; MARION, deep orange; OUR FRED, blush-pink; PRINCE OF ORANGE, pale orange; ROSINANTE, blush, very fine; SNOWDROP, white, remarkably small flower, pretty; WILLIAM PAYNE, deep orange, dwarf and free.

EARLY-FLOWERING VARIETIES. Though the early-flowering Chrysanthemums have not made the advance in public favour that they should have done, considering their great utility alike for garden decoration and for furnishing cut flowers for home use or for market, there is strong evidence that their merits are beginning to be more fully recognised, and that their culture is extending in all directions. In time, no doubt they will occupy much of the space now devoted to plants which neither produce such a good display in the flower garden nor supply so many cut flowers for so long a period.

In forming a collection of early-flowering Chrysanthemums, it is always advisable to grow two lots of plants of the same varieties, one in pots, and another outside in a nice sunny position. The former will be extremely useful for room or conservatory decoration, and should any of the plants outside prove tender and unable to withstand the rigour of winter, or fail to throw up cuttings for propagating, their stock may be grown from the pot plants, and the risk of losing choice varieties is reduced to a minimum. Unless duplicates are thus grown, it is practically certain that losses will occur amongst the outside plants, and usually most highly-prized varieties are those to disappear.

With all early-flowering varieties the end of February or beginning of March will be quite soon enough to put in cuttings. If inserted earlier they seldom make such good or such floriferous plants as those put in later, which grow on freely without a check. In taking cuttings, it is always best to choose those shoots springing from the soil, avoiding those which may have formed on the stem below where it was cut down; the latter never make such large or vigorous plants as those struck from suckers coming through the soil. In preparing the cuttings, carefully remove a few of the lower leaves, and then insert singly in small pots, properly drained, using a sandy compost of loam and leaf-mould, in equal proportions, thoroughly mixed. Press the soil firmly about the cutting, and immediately afterwards give a good watering, which tends to settle the soil, and to prevent the foliage from flagging. A close cold frame is a very suitable

Chrysanthemum—*continued.*

place to stand the pots in, keeping it quite close until the cuttings are rooted and beginning to grow. Every care should be taken to see that the plants have sufficient water.

As soon as it is seen that the cuttings have taken root, air should be gradually admitted on all favourable occasions in order to keep the plants sturdy and strong. About the first week in April the plants may be shifted into larger pots (say large "sixties"). By the middle of May these pots will be full of roots, and the plants may be either transferred to the pots in which they are intended to flower, or they may be put out in a sunny place, where the soil has been deeply dug and well manured during the past winter. If potted, a compost of three parts fibrous loam and one part spent horse-droppings mixed together, with a little bone-meal added, will prove excellent.

Naturally, some varieties are much taller than others, and in the list appended the average height of each is mentioned, indicating which sorts are best for back and front rows respectively. A fine effect may be produced by a judicious blending of colours; or the beds in large gardens may be planted with one variety only, thus giving a mass of one colour, as is done in many of the large public parks. The plants should be supported by neat stakes early, otherwise many will be broken by the wind, and thus cause unsightly blanks in the beds. If the soil is rich and deep, and the plants are strong and healthy, 2½ft. or 3ft. between each will be a suitable distance; if the soil is poor or shallow, 1ft. less space should be given. On all soils, however, it is advisable to make fresh plantations each year.

Japanese, or **Large-Flowered.** The following varieties have proved most meritorious in a large collection:

ALBERT CHAUSSON, orange-red, very fine in pots or beds, height 2½ft.; ALFRED DROZ, soft yellow, borne in profusion, height 2ft.; BARONNE G. C. DE BRAILLES, pale pink, very large and fine, height 3ft.; COMTESSE FOUCHER DE CARIEL, orange-yellow, excellent and free, height 2ft.; CORAL QUEEN, lovely coral, a charming variety, height 3ft.; CRIMSON QUEEN, deep crimson, a great favourite, and of fine habit, height 2ft.; DE LA BOUÈRE, amaranth, large and fine, height 2ft.; DORCAS, white, bushy habit and free-flowering, height 2ft.; EDIE WRIGHT, pale pink, passing to white with age, excellent in every respect, height 2ft.; EDITH SYRATT, soft pink, wonderfully free and dwarf, height 1½ft.; GASPARD BOUCHARLAT, a lovely orange colour, produced in profusion, height 2ft.; GENERAL HAWKES, crimson-amaranth, very free, height 2ft.; GEORGE WERMIG, rich soft yellow, a well-known old favourite, height 2½ft.; HARVEST HOME, bronzy-red, tipped with gold, very handsome and free, height 2½ft.; LADY FITZWYGRAM, a splendid early white, height 2ft.; MADAME DESGRANGES, white, well known for its excellence, height 2½ft.; MADAME EULALIE MOREL, a beautiful cerise and gold, height 3ft.; MADAME MARIE MASSE, lilac-mauve, one of the best, height 2ft.; MYTCHETT WHITE, snowy white, a magnificent variety, height 1½ft.; PREFET CASSAGNEAU, deep crimson, fine habit, height 2ft.; RYECROFT GLORY, deep orange, most effective, height 1½ft.; SAM BARLOW, a charming salmon-pink, very free, height 3ft.; THE DON, lilac, profuse and early, height 2ft.; VICE-PRESIDENT HARDY, deep red, good habit, height 3½ft.

Pompones. The small compact-flowered Pompone varieties are greatly admired by many, and are extremely useful for cutting purposes or for massing in beds. Amongst the many varieties in commerce, the following may be described as of high merit:

ALICE BUTCHER, red, shaded with orange, excellent, height 2½ft.; ANASTASIO, pale purple, very dwarf and bushy, height 1½ft.; BLANCH COLOMB, ivory-white, free and pretty, height 2ft.; CANARI, yellow, flowers in great abundance, height 1½ft.; EARLY BLUSH, soft blush, very fine variety, height 2ft.; FREDERICK PELE, crimson and gold, makes an effective bed, height 3ft.; GOLDEN FLEECE, straw-yellow, one of the best of its colour, height 2ft.; L'AMI CONDERCHET, primrose, probably the best Pompone, height 1ft.; LONGFELLOW, pure white, splendid for cutting or for beds, height 2½ft.; MADAME JOLIVART, white, tinged with pink, very pretty, height 2ft.; MRS. CULLINGFORD, white, excellent, height 3½ft.; MISS DAVIS, soft pink, a sport from MRS. CULLINGFORD, but dwarfer; M. JULES PAQUET, white, and violet-rose, height 1ft.; MR. SELLEY, a blush-white, very pretty and effective, height 1½ft.; PIERCY'S SEEDLING, deep yellow, wonderfully free, height 2ft.; SILVERSMITH, white, of large size, a most useful variety, height 3ft.; STRATHMEATH, a soft rosy-pink, excellent, height 2ft.; TOREADOR, a rich crimson and gold, height 2½ft.; YELLOW L'AMI CONDERCHET, deep yellow, sport from L'AMI CONDERCHET.

INSECT AND OTHER PESTS. Aphides are amongst the most destructive insects infesting Chrysanthemums, and

Chrysanthemum—*continued.*

they multiply very rapidly. Frequently they are present in incredible numbers, though the "green-flies" at any rate approximate so closely to their surroundings that they are not so readily seen as the "black-fly" (*Aphis rumicis*), which is also troublesome. Under glass, the new vaporising insecticides are the best remedies to employ: they are easily applied, and very effective and cheap. Before using any insecticide it will be well to remove any of the Ladybirds and their larvæ, the leech-like larvæ of Hawk-fly (*Syrphus*), or even the gaily-apparelled, if gauzy-looking, Lace-wing Flies. They are the natural enemies of Aphides, and will consume vast numbers in a short time. Outdoors, a weak solution of carbolic soft-soap will be sufficient to cleanse the plants of "green-fly" and "black-fly," both of which species, as already stated, are at times troublesome. This will be rendered more effective if applied lukewarm.

Earwigs are most destructive at times to Chrysanthemum blossoms, and in a single night will disfigure the best of flowers, rendering them quite unfit for show. They should always be trapped with loosely-rolled tissue-paper, old dusters laid in the vicinity of the plants, or by means of an inverted flower-pot half-filled with hay and stood upon the stakes. It may here be stated that Earwigs, though as a rule vegetarians and destructive to many plants, occasionally forsake such a diet for one of flesh, and then they even render the gardener service by devouring Aphides, Thrips, and other injurious pests.

Occasionally the leaves of Chrysanthemums and closely-allied plants suffer from the attacks of that plague of the Marguerite-grower, *Phytomyza affinis*. This fly deposits its eggs upon the foliage; the larvæ are in due time hatched out, and feed between the two surfaces. Their presence is revealed by a blister-like swelling and by white or light-coloured zigzag tracks over the leaves. Feeding as they do, the pests are difficult to eradicate by means of insecticides; but, by way of prevention, the leaves of the plants may be sprayed with a weak emulsion of paraffin or with a quassia-chip solution; or fumigation will make the leaves distasteful to the perfect insect. The old-fashioned method of squeezing the insects between finger and thumb has much to recommend it. Sometimes plants are so badly attacked that nothing short of removing and burning the infested leaves is of any use.

Thrips are sometimes destructive to the shoots, but they may be destroyed by syringing them with the preparation suggested for Aphides on outside plants.

Ants are injurious to the buds, and will penetrate them if but a beginning has been made. They should be trapped by means of pieces of sponge dipped into a sweet liquid or by some bones containing a little meat. In the latter case the insects should be brushed off into boiling water, while in the former the sponge should be dropped into a vessel of boiling water.

Cockroaches of several kinds attack the blossoms, though on account of their night-feeding propensities they are seldom seen, and less often suspected. Heat, however, being absolutely necessary to the welfare of these insects, it is only where this is applied that Cockroaches are really troublesome. Phosphorus paste or the Ballinkin-rain Ant Destroyer may be employed in keeping down these insects.

Woodlice, like the Cockroaches, will considerably damage the blossoms. As a rule, they are strong in numbers, and once thoroughly established, they are difficult to oust. Vegetable traps, in the form of sliced or hollow potato, may be tried; but usually flower-pots half filled with hay and turned upon their sides are the most effective, as the Woodlice shelter there after their midnight revels, and may easily be shaken out and destroyed. More effective still is the trap where the inside of the pot is smeared with a sugary mixture composed of treacle, foots-sugar, and beer.

Slugs infest the Chrysanthemum, and take toll of the blossoms. They are nocturnal, and should be enticed with bran or brewers' grains, and then collected and destroyed.

Leather-jackets are the destructive larvæ of the Crane-fly, or Daddy Long-legs. They abound in pastures and lands, and therefore they may be readily introduced with the potting-soil. They feed for a long time as larvæ, and would quickly destroy the roots of any Chrysanthemum. The soil should be carefully examined at potting-

Chrysanthemum—*continued.*

time, and if any of the insects are noticed they should be destroyed.

Mildew, though not a formidable fungus disease like Leaf-Rust, described below, is undesirable, and has a debilitating effect upon its host-plant. The Mildew usually found upon Chrysanthemums is due to the presence of a specific fungus, *Oidium chrysanthemi*, a relative of that pest of the Vine, *Oidium Tuckeri*. Powdered sulphur, or better still, spraying with sulphide of potassium of the strength recommended for Leaf-Rust, will be found effectual, especially if combined with plenty of light and air, and fluctuations of temperature are avoided.

Leaf-Spot (*Septoria chrysanthemi*) is a disfiguring and weakening fungus disease characterised by dark brown spots on the foliage. They are at first small, but gradually increase in size, and the leaves fall. Spraying, as before recommended, is the remedy.

The condition of the blossoms popularly described as "damping" is too well known. Frequently it is present with the Mildew attack above noted, the conditions of the atmosphere being favourable for the development of either. Chrysanthemums in foggy towns are more liable to the condition than those grown where fogs are comparatively light. An atmosphere surcharged with moisture is also fatal, and therefore a buoyant one should prevail. Another prolific source of "damping" is due to the use, or rather to the abuse, of stimulants.

CHRYSANTHEMUM LEAF-RUST (*Puccinia hieracii*). Within the last year or so growers of Chrysanthemums have suffered not a little from the ravages of this destructive Rust-fungus. In several cases, practically whole collections have been destroyed, and in a great many more the loss has been extremely heavy. The generic name at once singles the pest out as a near relative of the much-dreaded Hollyhock fungus, and the specific one suggests that it is not the Chrysanthemum alone that it affects, but the Hawkweeds, many of which are among the commonest wayside flowers. It is necessary—indeed, important—to know this, as it to a certain extent accounts for the transference of the Rust by various agencies from weeds to cultivated plants. Nor are the Hawkweeds alone host-plants of the pest. Burdock, Knapweed, Thistle, and Groundsel are quite as commonly infested.

The Rust is found occasionally on the upper-surface as well as upon the under-surface of the leaves, which after a time are found to be covered with a number of brownish spots of varying size. Sometimes such spots are separate, at others they coalesce, until practically the whole leaf is involved; finally the leaf assumes a still more unhealthy hue—first yellow and then brown—and falls. Prior to this latter stage, however, the numberless spores which have formed have been distributed over an extended surface. Then it is that the parasite is readily carried by insect and other agencies into non-infected areas. In fact, a collection which, say a week or so before, presented a healthy appearance and without the slightest trace of fungus, could practically be ruined in that short time. First one plant, then another, become involved, and the collection goes from bad to worse. The actual time occupied by one of the spores in developing, once it has found a congenial resting-place, varies, but from eight to ten days at most would probably cover it.

Here it may be well to state that the first manifestations of the disease to the gardener are usually the formation of the now familiar Rust. Long ere this, however, the insidious pest has been working unseen on the leaf-tissues by means of mycelium. In fact, the "Rust" is the outward and visible sign that one kind of fruit has been matured—that known as uredospores, or summer spores—and it is by means of this that the area of infestation is increased. This is where the value of spraying comes in, as it prevents such spores as fall, or are carried upon the foliage, from germinating.

If spraying with a fungicide be not adopted, then later in the year (towards autumn) other spores are produced. These are named teleutospores. By means of these the plant-disease is usually carried over the winter, though in certain cases it may be continued by means of the summer spores. The grower would therefore be wise to burn such plants before they have arrived at the stage when the winter spores are formed. If this be not done the teleutospores are dispersed in various ways, many falling

Chrysanthemum Leaf-Rust—*continued.*

upon the soil. They will not germinate the same season, but they assuredly will do so in the ensuing spring, commencing again the cycle of life, unless the grower sprays his plants from the earliest times.

There is absolutely no cure when once the Leaf-Rust fungus has asserted itself. It is, however, possible to stay its progress by spraying with sulphide of potassium (a common fungicide with rosarians and others), at the rate of 1oz. to 3galls. of water, used lukewarm. This will destroy the spores before they can enter the foliage. Affected plants should also be isolated. As a precautionary measure, too, growers would be well advised to spray periodically—say, every eight or ten days—throughout the season. Still, notwithstanding the spraying, some of the spores will doubtless find a suitable resting-place. Where, therefore, the disease has been known to exist, very great care should be exercised by the gardener in collecting every leaf and stem from plants which have been infested, and instead of consigning them to the rubbish-heap they should be burned, otherwise next season the chances are that a severer attack will be experienced.

CHRYSANTHEMUM LEAF-SPOT. *See* **Chrysanthemum.**

CHRYSEIS. A synonym of **Eschscholtzia** (which *see*).

CHRYSIPHIALA. Included under **Stenomesson** (which *see*). *C. latifolia*, however, is a synonym of **Urceolina latifolia.**

CHRYSOBAPHUS. A synonym of **Anœctochilus** (which *see*).

CHRYSOBOTRYA. Included under **Ribes** (which *see*).

CHRYSOCEPHALUM. A synonym of **Helichrysum** (which *see*).

CHRYSOCOMA LINOSYRIS. *See* **Aster Linosyris.**

CHRYSOGLOSSUM (from *chrysos*, yellow, and *glossum*, a tongue; in allusion to the colour of the lip). ORD. *Orchideæ*. A small genus (four or five species) of stove, terrestrial Orchids, with the habit of *Tainia*, natives of India and Malaya. Flowers mediocre, shortly pedicellate, disposed in a lax raceme; pollen masses two, free. Pseudo-bulbs narrow or wanting, one-leaved. *C. villosum* is in the Kew Collection. For culture, *see* **Calanthe.**

C. villosum (villous). *fl.* yellow, banded with purple, villous, ¾in. in diameter; lateral sepals decurved; petals curved upwards; mid-lobe of lip panduriform; scape (with raceme) 1ft. to 2ft. long. *l.* solitary, 6in. to 12in. long, broadly elliptic or ovate, villous; petiole 1in. to 2in. long. Perak and Java.

CHRYSOMELIDÆ. *See* **Phyllotreta.**

CHRYSOPA VULGARIS. *See* **Lacewing Flies.**

CHRYSOPHYLLUM. SYNS. *Cainito, Nycteristion.* This genus comprises about sixty species, mostly tropical American, a few being found in Africa, tropical Asia, Australia, and the Sandwich Islands. To those described on p. 325, Vol. I., the following should be added:

C. imperiale (imperial). *fl.* yellowish-green, fascicled at the sides of a branch as thick as the finger, pedicellate; corolla subrotate, five-lobed. April. *fr.* the size of a small Apple, obtusely five-angled. *l.* 3ft. long, 10in. broad, petiolate, obovate-oblong or oblong-oblanceolate, acute or obtuse, deeply serrated. Brazil. (B. M. 6823.) SYN. *Theophrasta imperialis* (I. H. xxi. 184; R. G. 1864, 453).

CHRYSORRHOË. Included under **Verticordia** (which *see*).

CHRYSOSTEMMA. Included under **Coreopsis** (which *see*).

CHRYSOTHAMNUS. A synonym of **Bigelovia** (which *see*).

CHRYSOTHEMIS. A synonym of **Tussacia** (which *see*).

CHRYSOXYLON. A synonym of **Pogonopus** (which *see*).

CHTHAMALIA. A synonym of **Lachnostoma** (which *see*).

CHUSQUEA (said to be the native name of some of the species in the West Indies). SYNS. *Dendragrostis, Rettbergia.* ORD. *Gramineæ*. A genus embracing about thirty species of suffruticose or arborescent, sometimes climbing, American Grasses. Flowers in terminal panicles; spikelets one-flowered, variously paniculate. Leaves often rather small for the tribe (*Bambuseæ*), flat, articulated with the sheaths. *C. abietifolia*, the only species known to cultivation in this country, is an interesting and graceful, stove, climbing Bamboo. It thrives in well-drained loam, and is propagated either by means of imported seeds or by division of the rootstock.

C. abietifolia (Abies-leaved). *fl.* in racemes, terminating the leafy branches; spikelets green and purple, ¼in. to ½in. long, December. *l.* ½in. to ⅔in. long, ⅛in. broad, strict, erect, sessile on the sheath, linear-lanceolate, acuminate. Stems wiry, smooth, terete. Jamaica, 1885. (B. M. 6811.)

CHYLODIA. A synonym of **Wulffia** (which *see*).

CHYSIS. The cultural requirements of these Orchids are a light position in the warm intermediate or Cattleya house, and during the growing season an abundant supply of moisture, both at the roots and in the atmosphere. After growth has become matured less moisture and lighter and more airy conditions should prevail. Full exposure to the autumn sun in a vinery, where the leaves have fallen, suits them admirably. The pots used should be drained to two-thirds their depth with clean broken crocks, and the potting compost may consist of fibrous peat and sphagnum, with a liberal sprinkling of rough sand or broken crocks. The best season to pot is when the young growths commence to emit new roots from their base.

The six or eight species referred to this genus are natives of Mexico and Colombia. To those described on pp. 326-7, Vol. I., the following should be added:

C. aurea maculata (spotted). *fl.*, sepals and petals tawny-yellow, zoned with purple, white at base; side lobes of lip yellow, stained brownish-purple at base, the middle lobe purple with pale markings. Venezuela, 1850. (B. M. 4576.)

C. Bruennowiana (Bruennow's). *fl.* of a pinkish hue, medium-sized. Peru, 1893. This closely resembles *C. aurea* in habit, but is regarded as a distinct species. SYN. *C. Oweniana.*

C. Limminghei (Comte Alfred de Limminghe's). *fl.* 2in. across; sepals and petals white, with a purple blotch at apex; side lobes of lip reddish-purple and yellow inside, pale buff-yellow outside, incurved towards the column, the middle lobe bright purple, streaked with yellow, emarginate; column white above, yellow spotted with red opposite the lip. Tabasco, Mexico, 1857. This is now classed as a distinct species. (B. M. 5265, as a var. of *aurea*; I. H. 1860, t. 240; W. S. O. i., t. 34.)

C. Oweniana (Owen's). A synonym of *C. Bruennowiana.*

C. undulata (wavy). *fl.* ten to twelve in a raceme; sepals and petals of a lively orange-yellow; lip cream-coloured, marked with numerous lines of pink. Pseudo-bulbs 1½ft. high. Native country unknown. A rare but handsome species.

The following are hybrids:

chelsoniensis ..... *bractescens* and *lævis* (Veitch).
langleyensis ..... *bractescens* and *Sedenii* (Veitch).
Sedenii ..... *Limminghei* and *bractescens* (Veitch).

CHYTROGLOSSA (from *chytros*, a well, and *glossa*, a tongue; in allusion to the hollow at the base of the lip). ORD. *Orchideæ*. A small genus (two species) of stove, epiphytal Orchids, with very short stems, natives of Brazil. Flowers mediocre, shortly pedicellate; sepals and petals similar, free, spreading; lip continuous with the base of the column, obscurely three-lobed, with one or two callosities at base; column short; raceme recurved or pendulous. Leaves sub-distichously fascicled, oblong-elliptic or linear, flat. These plants should be grown on blocks, in a hot, damp stove.

C. aurata (golden). *fl.*, sepals green and yellow, petals white, the base of the column and lip spotted with purple; dorsal sepal and petals forming a kind of helmet over the column; raceme glaucous, zigzag. *l.* few, lanceolate, acute, 2in. to 3in. long. 1865. (J. H. S. ser. ii., vol. i., t. 3.)

Chytroglossa—*continued.*

C. Marileoniæ (Marie Léonie's). *fl.* having a three-lobed lip, with a two-starred callus at base. Otherwise resembling *C. aurata.* 1865.

CICATRICE, CICATRIX. The scar left by a falling leaf or other organ.

CICELY, SWEET. *See* **Myrrhis odorata.**

CICENDIA (a name of doubtful derivation). ORD. *Gentianeæ.* A monotypic genus. The species, *C. pusilla*, is a dwarf, much-branched annual, native of Western Europe (Britain), with small, pink, white, or pale yellow flowers; it is of no horticultural value.

CICER (from *kikos*, strength; in allusion to the properties anciently attributed to the seeds). ORD. *Leguminosæ.* A small genus (about seven species) of stove or greenhouse, annual or perennial herbs, natives of the Mediterranean region and West and Central Asia. *C. arietinum* (Chich Pea) is widely cultivated as pulse, but has no horticultural value (B. M. 2274).

CICINDELA CAMPESTRIS. *See* **Tiger Beetles.**

CIDARIA. A genus of Moths, several species of which are hurtful in gardens. The commonest are *C. associata* (*C. dotata*, Gn.) and *C. prunata* (*C. ribesiaria*). The larvæ of the former feed upon Currants, and those of the latter upon both Gooseberries and Currants. The perfect insects of *C. associata* are about 1½in. in wing-expanse, and are flying in July. The fore-wings are pale ochreous yellow, with three reddish-brown zigzag lines—two before and one behind the middle. The hind-wings are much paler. The larvæ are slender, pale green, with a pale yellow stripe on each side; they are feeding during May and June.

C. prunata is rather larger than *C. associata*, but has brown fore-wings, with indistinct darker striæ, and grey hind-wings. It is on the wing in July. The larva is green or brown, with a darker brown white-spotted ring, and some whitish triangular spots bordered with brown. It feeds in May and June.

C. fulvata (Barred Yellow Moth) is a third species, not so common in gardens, but nevertheless destructive to Roses. The Moth itself is about 1in. in wing-expanse; it has bright yellow fore-wings, with basal patch rusty red, and having a wavy edge; there is also a middle reddish band suffused with a darker colour, as well as a yellow costal blotch. The hind-wings are whitish-yellow. The larva is found in May and June; it is pale green, with darker green dorsal lines and yellow stripes at side.

As these are chewing insects, the bushes had better be sprayed with Paris Green (1oz. to 20galls. of water), taking care that in the case of the Gooseberries and the Currants the fruit is not required for culinary purposes until some time after. Or powdered hellebore, if dusted on in the early morning, will be similarly efficacious; but this, too, is a powerful poison, and must be used with care.

CIENFUEGIA. A synonym of **Fugosia** (which *see*).

CIENFUGOSIA. A synonym of **Fugosia** (which *see*).

CIMICIFUGA PALMATA. A synonym of **Trautvetteria palmata** (which *see*).

CIMINALIS. A synonym of **Gentiana** (which *see*).

CINCHONA. Quina; Quino; Quinquina. SYN. *Kinkina.* Thirty-six species are comprised in this genus. To those described on p. 327, Vol. I., the following variety should be added:

C. Calisaya Josephiana (Joseph de Jussieu's). A very distinct variety, with whitish, very fragrant flowers. Bolivia and Peru, 1866. (B. M. 6052.)

C. Condaminea (Condaminea). A synonym of *C. officinalis.*

CINERARIA. SYN. *Xenocarpus.* Of the twenty-five species included in this genus, twenty-two are natives of South and three of tropical Africa. Leaves alternate or radical, often broad and incised-toothed or variously pinnatisect, rarely entire. To the species and varieties described on pp. 329-30, Vol. I., the following should be added. Several plants formerly included here are now referred to **Senecio.**

C. albicans (whitish). *fl.-heads* clear yellow, ¼in. to ⅜in. in diameter; corymb terminal, few-headed. *l.* somewhat reniform or nearly circular in outline, cordate at base, five- to seven-

Cineraria—*continued.*

lobed; lobes equally trilobulate and many-toothed. Stems 1ft. to 1½ft. high, clothed with cottony tomentum. Natal, 1895. Half hardy.

C. aurita (eared). A garden synonym of *Senecio Heritieri.*

C. cruenta. The correct name is *Doronicum cruentum.*

C. gigantea (gigantic). A synonym of *Senecio Smithii.*

C. lanata (woolly). A synonym of *Senecio Heritieri.*

C. longifolia. The correct name is *Senecio brachychætus.*

C. Lynchii (Lynch's). A garden hybrid between *C. multiflora* and *C. cruenta.* 1897.

C. maritima. The correct name is *Senecio Cineraria.*

C. m. aureo-variegata (golden-variegated). *l.* green, margined with creamy-yellow. 1893. A pretty variety. (J. H. xxvi., p. 438, f. 78.)

C. m. candidissima (whitest). In this variety the foliage is remarkably white and compact.

CINNAMODENDRON. A couple of species form this genus, one being a native of the Antilles and the other Brazilian. Bracts three; sepals and petals four or five, sub-equal; cymes few-flowered. For culture, *see* **Canella.**

CINNAMOMUM. *Camphora* is included in this genus by the authors of the "Genera Plantarum." *C. Camphora* is the correct name of *Camphora officinalis.* The following species is worth description:

C. zeylanicum (Cingalese). Cinnamon-tree. *fl* yellowish-white, in terminal racemes. *fr.* berry-like. *l.* opposite, petiolate, ovate-oblong, entire, coriaceous, glabrous, 3in. to 4in. long. *h.* very variable. Ceylon. SYN. *Laurus Cinnamomum.*

CIONIDIUM. *See* **Deparia.**

CIPURA. SYN. *Marica* (of Schreber). *C. martinicensis* is synonymous with *Trimezia martinicensis.*

CIRCUMCISED. Divided in a transverse, circular manner.

CIRRHÆA. *C. saccata* (B. M. 3726) and *C. viridi-purpurea* (B. M. 2978) are included among the Kew collection of Orchids; but, as observed on p. 330, Vol. I., the species of this genus are rarely seen in cultivation.

CIRRHOPETALUM. SYNS. *Hippoglossum, Zygoglossum.* The species of this genus are mostly natives of the East Indies (thirty-eight are described in Hooker's "Flora of British India") or the Malayan Archipelago; one is found in the Mascarene Islands, another in China, and a third in Australia. To those described on pp. 330-1, Vol. I., the following should be added:

C. Amesianum (Hon. F. L. Ames's). *fl.* rather large, six to ten in a nodding spike; lateral sepals yellowish-white, shaded with rosy-purple at the base, united; dorsal sepal and petals yellow, fringed with reddish-brown; lip reddish-brown; scapes nodding. *l.* broad. Pseudo-bulbs quadrangular. Tropical Asia. (L. vii., t. 314.)

C. appendiculatum (having an appendage). *fl.* solitary, about 8in. long; upper sepal white, with three purple lines, and bearing at the apex a long, slender, purple plume; petals white, with one purple line, and a brush-like plume at the end of each; lip of two shades of bright purple, thick, tongue-like, and the long, lower sepals whitish with purplish marks, and united (or so closely placed as to appear to be so), each finishing up in a slender point Bengal, 1898. A most remarkable species. (G. C. 1898, ii. pp. 391, 415, f. 118.)

C. Blepharistes (eyelid-like). *fl.*, lateral sepals pale yellowish-green, with faint red nerves, coherent, 1in. long; petals yellow, tipped with red; raceme short, erect, dense-flowered. *l.* 2in. to 3in. long, oblong, very thick. Pseudo-bulbs 1½in. to 3in. long, oblong. Khasia, &c.

C. brevipes (short-stalked). *fl.* rose-pink, three to four in an umbel; lateral sepals free, 1in. long; scape ½in. to 1in. long. *l.* 2in. long, linear-oblong. Pseudo-bulbs erect, 1in. to 1½in. long. Rhizome long and slender. Sikkim Himalaya.

C. cæspitosum (tufted). *fl.* pale ochreous-yellow, cellular or papillose; lateral sepals ⅜in. long; umbel few-flowered. April. *l.* 4in. to 6in. long, linear- or oblong-lanceolate. Pseudo-bulbs ovoid. Khasia, &c., 1837.

C. Collettii (Collett's). *fl.* dark purple and yellow; dorsal sepal ⅜in. long; lateral ones 4in. to 5in. long, with filiform tips; umbel many-flowered; scape 3in. to 6in. long, very robust. *l.* 1in. to 1½in. long, sessile ovate to elliptic-oblong, thick. Pseudo-bulbs very small. Rhizome very stout. Eastern Birma, 1891. The largest and most beautiful of the Indian species. (B. M. 7193.)

Cirrhopetalum—*continued.*

C. compactum (compact). *fl.* pale straw-yellow, small, sub-umbellate, nodding; lateral sepals about ¼in. long. September. *l.* 1in. to 1¼in. long, elliptic-oblong, fleshy, sessile. Pseudo-bulbs ½in. long. Tenasserim, 1895.

C. cornutum (horned). *fl.* arranged in a radiating umbel; lateral sepals reddish-brown, 1½in. long, convex, coherent; dorsal sepal and petals green, blotched with purplish-brown; scape long and slender. *l.* 6in. to 10in. long, linear-oblong. Pseudo-bulbs 1in. to 5in. long, ovoid or columnar. Sikkim and Khasia, 1852. A pretty and curious species. (B. M. 4753.)

C. Curtisii (Curtis's). *fl.* white, pink, and yellow, small, disposed in an umbel; scape 4in. long. *l.* linear-oblong, 4in. long. Pseudo-bulbs ovoid, ½in. long. Rhizome flexuous. Malacca, 1897. Allied to *C. Cumingii*. (B. M. 7554.)

C. elegantulum (somewhat elegant). This is described as a species "too small to be showy, though the flowers are pretty enough, being striped with maroon-purple on a pale ground." Madras, 1891.

C. fimbriatum (fringed). *fl.* green, with long red cilia to the petals; lateral sepals 1in. to 1½in. long; umbels many-flowered. April. Pseudo-bulbs globose, smooth, leafless when flowering. Bombay, 1838. (B. M. 4391.)

C. Gamblei (Gamble's). *fl.* yellow, streaked and dotted with red; lateral sepals ½in. long; scape 1in. to 2in. long, very slender. *l.* 1in. to 2in. long, linear-oblong or -lanceolate. Pseudo-bulbs ½in. long, ovoid. Nilghiri Hills.

C. gamosepalum (with united sepals). *fl.*, dorsal sepal and petals bright red, the lateral ones speckled with purple, ¾in. long and at first coherent, at length widely divergent; scape slender, 4in. long. *l.* 2in. to 5in. long, linear-oblong or oblanceolate. Pseudo-bulbs 1in. to 1½in. long. Tenasserim, &c.

C. gracillimum (very slender). *fl.* reddish-purple, in shape like those of *C. vaginatum*; lateral sepals 1½in. long; scape slender, 6in. to 7in. long. *l.* 2½in. long, oblong, attenuated at base. Pseudo-bulbs ¾in. long, tetragonal-ovoid, one-leaved. Rhizome creeping. Birma (?).

C. grandiflorum (large-flowered). *fl.* purple; sepals acuminate, the lateral ones 2in. long, the dorsal one cymbiform, ciliated; scape as long as the leaves, stout. *l.* 3in. to 5in. long, linear-oblong, shortly petiolate. Pseudo-bulbs conical. Ceylon, 1895.

C. graveolens (strongly-scented). *fl.* strongly scented; sepals and petals yellowish-green, speckled with red; lip reddish-brown, changing to deep purple; raceme 7in. across, about thirteen-flowered; scape 6in. high. *l.* 1ft. long, 5in. broad. New Guinea, 1896.

C. guttulatum (slightly striped). *fl.*, sepals yellowish or greenish, speckled with purple, spreading, the lateral ones ½in. to ¾in. long; lip short; umbel few-flowered; scape 6in. to 10in. long, sprinkled with purple. *l.* 6in. to 10in. long. Pseudo-bulbs 1in. to 2in. long, ovoid. Sub-tropical Himalaya, 1837. (B. M. 4267.) SYN. *Bulbophyllum umbellatum* (B. R. 1844, t. 44).

C. Lendyanum (Lendy's). *fl.* whitish, with a greenish-yellow hue; lateral sepals free, twice as long as the ligulate, acuminate upper one; petals ligulate, acuminate; lip compressed, bicarinate on the narrow upper side; raceme umbellate. *l.* cuneate-oblong, acute, minutely bilobed, purple beneath. Pseudo-bulbs pyriform-tetragonal, reddish. 1887.

C. Macræi (Macrae's). *fl.* between umbellate and racemose; sepals pale yellow and scarlet, the lateral ones 3in. long, coherent, with long, filiform tips; scape 6in. long, very slender. April. *l.* 3in. to 5in. long, oblong, petiolate. Pseudo-bulbs scarcely as large as nutmegs. Ceylon, 1839. (B. M. 4422.)

C. maculosum (spotted). *fl.* pale yellowish-green, unspotted [*sic*], two to five in an umbel; lateral sepals ½in. to ¾in. long; scape stout, 2in. to 3in. long. *l.* 5in. to 6in. long, linear, notched. Rhizome slender. Western Himalaya, 1841.

C. Makoyanum (Makoy's). *fl.* pale yellow, dotted with red, 1½in. long, twelve to fourteen in a star-like umbel; scape very slender, erect, reddish-brown. January. *l.* oblong-oblanceolate. Pseudo-bulbs sparse, narrow-pitcher-shaped. Rhizome robust, creeping. East Indies (?), 1892. (B. M. 7259.)

C. Mastersianum (Dr. Masters'). *fl.* deep yellow, 1½in. long, with the upper half of the lateral sepals brown and the lip brownish-purple; umbels six- to eight-flowered, borne on purplish, drooping scapes. *l.* 4in. to 5in. long, 1in. broad. Pseudo-bulbs ovoid-quadrangular, one-leaved. Dutch Indies, 1890. (L. vi., t. 255.)

C. Medusæ. The correct name is *Bulbophyllum Medusæ*.

C. mysorense (Mysore). *fl.* almost white, except the lip, which is purple; lateral sepals ½in. long; scape 3in. to 4in. long. September. *l.* 3½in. long, linear-oblong, attenuated at base. Pseudo-bulbs ¾in. to 1in. long, tetragonal-ovoid, one-leaved, distant. Hills of Mysore, 1891. Allied to *C. maculosum*.

C. nodosum (having prominent nodes). *fl.* densely speckled with reddish-brown on a darker ground, sub-racemose, 1½in.

Cirrhopetalum—*continued.*

long; scape 3½in. long, six- or seven-flowered. *l.* 5½in. long, linear-oblong, narrowed at base. Pseudo-bulbs distant, the intervals on the rhizome showing several thickened nodes. Southern India, 1892. Allied to *C. Macræi*.

C. Obrienianum (O'Brien's). *fl.* yellow and maroon, small, borne on a scape 9in. long. *l.* oblong, 2¼in. long. Pseudo-bulbs ovoid, ½in. long. Borneo, 1893. Allied to *C. Makoyanum*.

C. ornatissimum (very ornate). *fl.* pale yellow, streaked and stained with purple, about the size of those of *C. Thouarsii*;

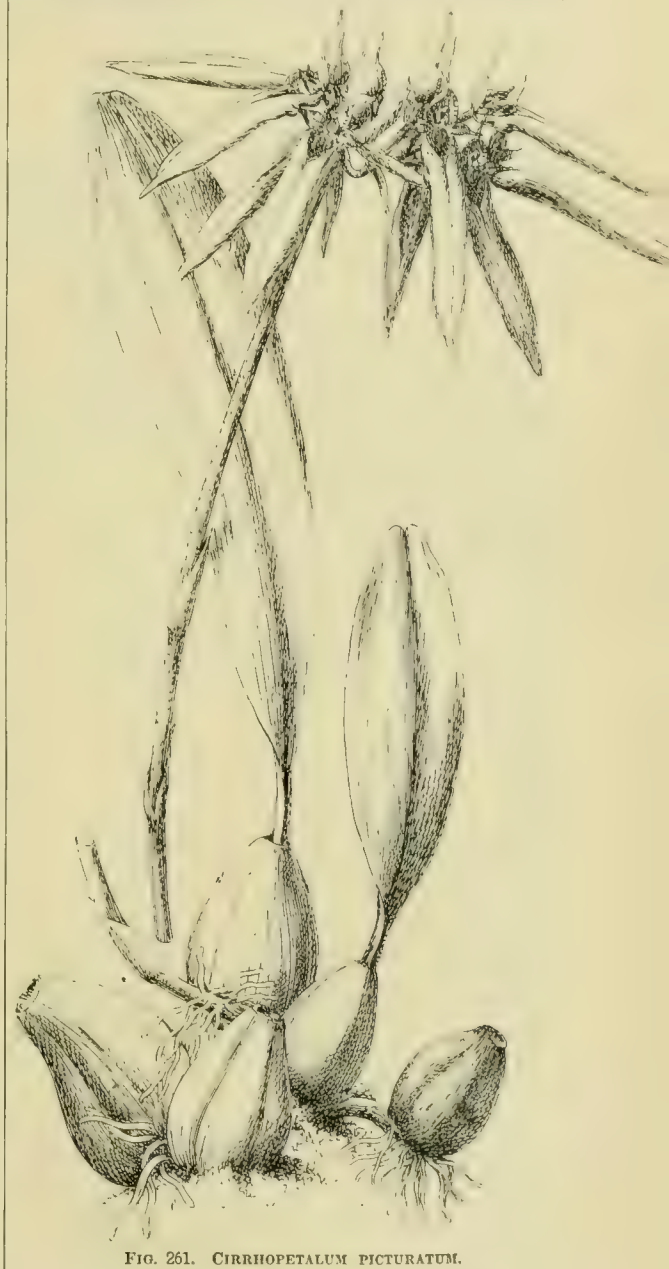

FIG. 261. CIRRHOPETALUM PICTURATUM.

dorsal sepal fringed at apex, the lateral ones prolonged into slender tails; lip deep purple, reflexed, with a curved claw; umbel four- or five-flowered; scape short. *l.* oblong, 4in. to 5in. long. Pseudo-bulbs ovoid, 1in. to 1½in. long. Sikkim Himalaya, 1889. (B. M. 7229; W. O. A., t. 369.)

Cirrhopetalum—*continued.*

C. picturatum (adorned). *fl.* 2in. or more in length; upper sepals ½in. long, with a terminal, purple thread ½in. long; lateral sepals connivent in a pale, dirty green, convex blade; petals very small; umbel about ten-flowered; scape green, speckled with purple, 8in. to 10in. long; sheaths speckled red. *l.* solitary, 3in. to 6in. long, 1½in. broad, linear-oblong. Pseudo-bulbs tufted. Moulmein, 1885. See Fig. 261. (B. M. 6802.)

C. pulchrum (beautiful). *fl.*, dorsal sepal purple, dotted with fuscous-purple, the lateral ones connate in a yellow, purple-blotched, linear-oblong, obtuse lamina, 1½in. long; petals purple, falcate; lip purple, linear-oblong, recurved; pedicels ½in. long; umbel about seven-flowered; scape erect, 4in. to 5in. long. *l.* oblong, obtuse and emarginate at apex, narrowed at base, thick. Halmahera, 1886.

C. refractum (bent back). A synonym of *C. Wallichii.*

C. robustum (robust). *fl.* 2½in. long; sepals and petals greenish-yellow, tinged with purple; lip deep reddish-purple; scape very stout, bearing an eleven-flowered umbel 7½in. across. *l.* thick and leathery, 13in. long, 4in. broad. Pseudo-bulbs large, ovate, angled. New Guinea, 1893. Probably the largest species known. (B. M. 7557; G. C. 1895, ii., p. 771, f. 116.)

C. Rothschildianum (Hon. W. Rothschild's). *fl.* bright crimson-purple, blotched with yellow on the sepals. Pseudo-bulbs ovate or pyriform. Darjeeling, 1895. A new species, closely allied to *C. Collettii.* (G. C. 1895, xviii., p. 608, f. 102.)

C. setiferum (bristle-bearing). *fl.* umbellate, 2in. long; sepals and petals bristly; scape slender, 9in. to 10in. long, four- to six-flowered. August. *l.* 9in. to 10in. long, narrow-oblong, obtuse. Pseudo-bulbs 1in. long, 1in. to 2in. distant. Himalayas, 1891. Allied to *C. picturatum.*

C. stragularium (curtained). *fl.*, middle sepal spotted purple, purple at top, elliptic, cucullate, the lateral ones sulphur, blotched and spotted purple; petals yellowish, spotted purple, brownish-purple at apex; lip numerously spotted with blackish-purple, curved, with two divaricate angles near the base, convolute. *l.* petiolate, cuneate-oblong, blunt, 6in. to 7in. long. 1887. This "may be the same as *C. pulchrum*" (H. G. Reichenbach).

C. Thwaitesii (Thwaites'). *fl.* pale straw-coloured; lateral sepals ½in. long, lanceolate, widely spreading, twice as long as the ovate dorsal one; petals acute. Ceylon (at 4000ft. to 7000ft. elevation). According to Hooker, there is some confusion regarding this species.

C. vaginatum (sheathed). *fl.* pale yellow, 1in. or more in length; dorsal sepal many times longer than the lateral ones; lip two-ridged; scape 2in. to 3in. long, laxly sheathed. *l.* 2in. to 4in. long, oblong, emarginate. Pseudo-bulbs ½in. to 1in. long, conical. Rhizome very stout. Penang, &c., 1843.

C. Wallichii (Wallich's). *fl.* reddish-brown; lateral sepals 1in. to 1½in. long, three or four times as long as the dorsal one; umbels few-flowered; scape equalling or exceeding the leaves. *l.* 2in. to 4in. long, elliptic-oblong. Pseudo-bulbs ¾in. to 1in. long, sub-globose, ovoid or elongated. Temperate Himalaya, 1837. SYN. *C. refractum.*

C. Wendlandianum (Wendland's). *fl.* of a wine-purple colour; sepals ciliated with a few trembling, clavate hairs, and having tails 6in. to 7in. long. British Birma, 1891. Something in the way of *C. Collettii.* (R. X. O., t. 243.)

C. Whiteanum (White's). *fl.* light straw-yellow, with a bright yellow lip. Moluccas (?), 1895. This species is allied to *C. vaginatum,* but has pseudo-bulbs and leaves scarcely half as large.

C. Wightii (Wight's). *fl.* ochreous-green; sepals having a marginal line of red specks, the lateral ones ¾in. long; umbels six- to eight-flowered; scape shorter or longer than the leaf, speckled with red. *l.* 1½in. to 2½in. long, elliptic or linear-oblong. Pseudo-bulbs ovoid. Rhizome stout. Ceylon.

The following species are grown at Kew, but are rarely met with elsewhere: *C. concinnum, C. delitescens, C. mundulum, C. proliferum.*

CISSUS. To the species described on p. 331, Vol. I., the following should now be added. *See also* **Ampelopsis** and **Vitis.**

C. incisa (cut). *fl.* in a somewhat corymbose or compoundly umbellate panicle. *fr.* black, shining, as large as small peas. *l.* thick, pale green, glabrous, the lowest three-lobed, the upper ones trifolioliate; leaflets 1in. to 2in. long, sometimes two- or three-lobed. Stem woody. *h.* 4ft. to 5ft. United States.

C. i. Rocheana (Roche's). *fr.* more globose than in the type. Central Africa. (R. H. 1884, p. 272.)

C. mexicana (Mexican). *fr.* red or white, large, and of a fine flavour. *l.* something like those of the common Vine. Stems annual. Sinaloa, Mexico, 1888.

Cissus—*continued.*

C. velutinus (velvety). *fl.* of an intense coral-red; peduncle at least twice as long as in *C. discolor;* cyme larger and laxer *l.* green, broadly veined with white above, blood-red beneath. Habit as *C. discolor.* Habitat unknown. (B. M. 5207.)

CISTELLA. A synonym of **Geodorum** (which *see*).

CISTUS. Including *Halimium.* About a score species are sufficiently distinct to rank as such: they are all natives of Europe, North Africa, and the Asiatic shore of the Mediterranean.

C. corbariensis. *See* **C. salvifolius corbariensis.**

C. florentinus. *See* **C. monspeliensis florentinus.**

C. guttatus (striped). A synonym of *Helianthemum gutta'um.*

C. tauricus (Taurian). This is one of the varieties of *C. creticus.*

CISTUS, GROUND. *See* **Rhodothamnus Chamæcistus.**

CITRIOBATUS (from *Citros,* a Citron, and *batos,* a thorn; the plant is known in Australia as the Orange Thorn). ORD. *Pittosporeæ.* A small genus (two species) of greenhouse, evergreen, rigid, much-branched, Australian shrubs, with small, solitary flowers, and insignificant, entire or toothed leaves. Both species have been introduced, but they are of little horticultural value.

CITRONELLA. A synonym of **Villaresia** (which *see*).

CITRUS. This genus embraces, according to Hooker, about seven species, natives of tropical Asia and Australia, and several of them broadly cultivated over the tropical regions of the globe. Calyx cup-shaped or urceolate, three- to five-cleft; petals four to eight, linear-oblong, thick, imbricated; stamens twenty to sixty. Fruit globose or oblong, fleshy, many-celled. To the species, &c., described on p. 335, Vol. I., the following varieties should be added:

C. Aurantium Bergamia. Bergamot Orange. *fl.* small, very sweet-scented. *fr.* pale yellow, globose or pear-shaped; pulp acidulous, with a pleasant aroma. (B. M. 7194.)

C. A. Bigaradia. The correct name of *B. vulgaris.*

C. Bergamia. A variety of *C. Aurantium.*

C. Bigaradia. A synonym of *C. vulgaris.*

C. buxifolia (Box-leaved), of gardens. A synonym of *Severinia buxifolia.*

C. Daidai (Daidai). A variety of the Mandarin Orange (*C. nobilis*). 1839.

C. Limetta and **C. Limonum** are varieties of *C. medica.*

C. Lumia (Lumia). Sweet Lemon. *fl.* tinged with red. *fr.* ovoid-oblong, with a long mamilla; rind having convex vesicles. *l.* having a simply-margined petiole. A sub-variety of *C. medica Limetta.*

C. medica Riversii (Rivers'). Bijou Lemon. *fl.* white, small. *fr.* small, globose. *l.* elliptic, serrated, on short, wingless petioles. 1885. (B. M. 6807.)

C. sinensis (Chinese). Chinese Orange. *fl.* very white. *fr.* about as large as a Plum, a little flattened; pulp bitter, acidulous. A variety of *C. Aurantium.*

C. triptera (three-winged). A garden synonym of *C. trifoliata.*

CLADANTHUS (from *klados,* a branch, and *anthos,* a flower; the flowers are produced at the ends of the branches). ORD. *Compositæ.* A monotypic genus. The species, *C. proliferus,* a half-hardy, strong-smelling annual, native of the South of Spain and Northern Africa, has been introduced, but is of no particular horticultural value.

CLADIUM (from *klados,* a twig). ORD. *Cyperaceæ.* A genus embracing about a score species of stove, greenhouse or hardy Sedges, found in all except cold climates. Flowers bisexual; glumes few, concave; spikelets terete, usually panicled or cymose. *C. germanicum* is useful for naturalising in boggy situations.

C. germanicum (German). *fl.*, spikelets ¼in. long, crowded in pedicelled heads ½in. in diameter; cymes axillary and terminal, corymbose, the branches 1in. to 3in. long. July and August. *l.* 2ft. to 4ft. long, ¼in. in diameter, rigid, keeled. Stems 2ft. to 5ft. high, terete or obscurely trigonal. Europe (Britain), North Africa, &c. SYN. *C. Mariscus.*

C. Mariscus (Mariscus). A synonym of *C. germanicum.*

CLADIUS PADI. *See* **Rose Sawflies.**

CLADIUS PYRI is the name scientists have bestowed upon a most destructive species of Sawfly infesting the leaves of both Pear and Plum, and, like many other members of the same family, it is unfortunately double-brooded, appearing in spring and autumn. The perfect insects are on the wing towards the end of April, and the eggs are laid on the under-surfaces of the leaves of the food-plant. They hatch out in rather more than a month, and the young larvæ at once commence to feed upon the leaves. Unlike many Sawflies—that infesting the Cob-nut, for instance—they are seldom observed either when feeding or when at rest, for in the latter condition they remain curled up in the under-sides of the leaves of their food-plant. There is, however, ample evidence of their presence, as the epidermis of the leaves attacked is entirely removed, while a little later large holes are made.

As soon as these larvæ are detected a sheet should be procured, and the branches of the trees lightly tapped, as the insects will fall to the ground on the slightest alarm. Syringing such trees with soapsuds will also make it unpleasant for any that remain, and also cause the insects to drop to the ground, a sheet having been arranged for their reception. From this they may be easily collected and despatched. If allowed to remain, the larvæ, when full-fed, spin a cocoon in the soil, and in that pupate, the perfect insects emerging as before noted. The remedies recommended under **Gooseberry and Currant Sawfly** will also be found useful.

CLADOBIUM. A synonym of **Scaphyglottis** (which *see*).

FIG. 262. FLOWERS OF CLARKIA ELEGANS FLORE-PLENO.

CLADOSPORIUM DENDRITICUM. *See* **Apple and Pear Scab** and **Pear Fungi.**

CLADOSPORIUM FULVUM. *See* **Tomato Leaf-Rust.**

CLADOSTYLES. A synonym of **Evolvulus** (which *see*).

CLAIRISIA. A synonym of **Anredera** (which *see*).

CLANDESTINA. Included under **Lathræa** (which *see*). *C. rectiflora* is now known as *L. Clandestina.*

CLAPPERTONIA. A synonym of **Honckenya** (which *see*).

CLARCKIA. *See* **Clarkia.**

CLARIONEA. A synonym of **Perezia** (which *see*).

CLARKIA. Also spelt *Clarckia.* Including *Phæostoma.* Four species, natives of North America, form this genus. These very effective annuals are very largely employed for borders. Old kinds like *C. elegans* have been improved by the florist, and we now have forms that for effect surpass it easily—Purple King, Salmon Queen, Tom Thumb Rose, and White Queen.

C. elegans flore-pleno. There are some lovely double-flowered forms, white, pink, and violet. They are more ornamental than the singles (see Fig. 262).

CLASS. In botany this term is used for a group of related natural orders.

CLASSIFICATION. *See* **Botany.**

CLAUSENA. *C. Wampi* is the correct name of *Cookia punctata.*

CLAVICEPS PURPUREA. *See* **Ergot Fungus.**

CLAVIFORM. The same as **Clavate** (which *see*).

CLAVIJA. SYNS. *Horta, Zacintha* (of Vellozo). About twenty-five species, all tropical American, are here included. To those described on p. 336, Vol. I., the following should be added :

C. Ernstii (Ernst's). *fl.* pendulous, ¾in. long; corolla fleshy, the disk apricot-colour; racemes 2in. to 4in. long, drooping, many-flowered. July. *l.* clustered at the ends of the branches, on long petioles, coriaceous, 12in. to 16in. long, 4in. to 6in. broad, pale beneath, elliptic-oblong, oblong-lanceolate, or oblanceolate, acute or sub-acute, entire. Trunk (in native specimens) 4ft. to 5ft. high. Caraccas, 1879. (B. M. 6928.)

C. cauliflora (SYN. *Theophrasta antioquensis*) has also been introduced.

CLAY. The bringing of heavy Clay land into a good state of cultivation needs very careful management. The object should be to ridge up the ground in winter as rough as possible, and to expose as great a surface to the action of frost and wind as can be; the addition of strawy-manure, road-scrapings, decayed vegetable matter, burnt refuse, or anything that will render the Clay more porous and friable will be of great service. Burning is a very expensive operation, and it is doubtful whether it would not be more profitable to drain and improve the soil by the addition of other things, than to burn the surface.

CLAY-COLOURED WEEVIL. *See* **Weevils.**

CLAYING. This consists in the addition of Clay to a light, porous soil, to make it heavier and more retentive of moisture, and to improve its staple generally. It is also occasionally used for lining a pond or lake to make it retain water which would otherwise filter away through the bottom and sides. In some parts this is termed "puddling."

CLAYTONIA. About twenty-five species form this genus. To those described on p. 336, Vol. I., the following should be added :

C. alsinoides (Alsine-like). *fl.* white, pedicellate, solitary or racemose; petals having two sharp teeth. March to June. *l.*, radical ones petiolate, ovate, acuminate; upper ones opposite, mucronate. Colombia, 1794. A form of *C. sibirica.* (B. M. 1309.)

CLEARWING MOTHS. *See* **Sesia.**

CLEISOSTOMA. SYN. *Pomatocalpa.* Including *Echioglossum.* This genus comprises, according to the "Index Kewensis," upwards of forty species, mostly natives of the East Indies, the Malayan Archipelago, and tropical Australia. To those described on p. 337, Vol. I., the following should be added:

C. brevipes (short-footed). *fl.* ⅜in. in diameter; sepals and petals orange-yellow, with two purple bands; lip pale yellow; spike 1in. to 1½in. long, dense-flowered. *l.* 4in. long, distichous, uniform, linear-lanceolate, acute, fleshy. Stems tufted, 8in. to 12in. long. Sikkim Himalaya.

C. crassifolium (thick-leaved). *fl.* sea-green, ½in. in diameter, with a rosy lip, produced in nodding panicles from the axils of the leaves. *l.* 8in. to 10in. long, closely set, thick, leathery, much recurved, resembling those of a Vanda. India, 1850. (L. iii., t. 139; L. J. F. 397; P. F. G. iii. 29.)

C. Guibertii (Guibert's). *fl.* pale whitish-yellow, with cinnamon rings; sepals and petals cuneate-oblong, obtuse; lip pandurate; column short; panicle many-flowered. Habitat not recorded, 1862. (L., t. 9.)

C. ringens (gaping). *fl.* ochreous, having the middle lobe of the lip purple and an orange spot on the side lobes; spur very large, broad, cylindrical; raceme few-flowered. *l.* oblong, emarginate, 3in. to 4in. long, 1½in. broad. Philippines, 1888. A pretty little species.

C. Wendlandorum (Wendland's). *fl.* yellow, minute, papillose; raceme or panicle 4in. to 6in. long. *l.* 6in. to 10in. long, 1in. to 1½in. broad, broadly lorate, coriaceous, bilobed. Stems 1in. to 1½in. long, very stout. Tenasserim, &c.

C. Zollingerianum (Zollinger's). A new species, "of Vanda-like habit, but with very short spikes of only a single flower, which is 1in. across and white with red-brown spots" (G. C.). Sunda Islands, 1897.

CLEISTES. Included under **Pogonia** (which *see*).

CLEISTOCACTUS. Included under **Cereus** (which *see*).

CLEITRIA. A synonym of **Venidium** (which *see*).

CLEMATIS. Including *Viorna* and *Viticella.* *Atragene* (*see* Vol. I., p. 143) is also merged hereunder by Bentham and Hooker. About 100 species are included in this genus; they are mostly dispersed over temperate regions, and are rarely found within the tropics. To the species and varieties described on pp. 338-40, Vol. I., the following should be added:

C. Addisoni (Addison's). *fl.*, sepals dark violet-purple, except at the acute, reflexed tips, which are yellow. Alleghany Mountains, 1896. This hardy species is closely allied to *C. Viorna.* (G. & F. 1896, p. 324, f. 43.)

C. alpina (alpine). The correct name of *Atragene alpina.*

C. angustifolia (narrow-leaved). *fl.* yellowish-white, not very numerous, scented, long-pedicellate, disposed in very loose panicles at the tips of the branches; sepals four, truncate, the borders recurved. June and July. *l.*, leaflets four or five, lanceolate, acute, glabrous, long-petiolulate. Austria. Allied to *C. Flammula.*

C. apiifolia (Apium-leaved). *fl.* dull white, with six styles, paniculate. August and September. *l.* ternately cleft; segments ovate, acuminate, incised-toothed. *h.* 10ft. Japan. A strong, hardy climber.

C. barbellata (slightly-bearded). *fl.* dull purple, large; sepals oblong, acuminate, pubescent on both sides, the margins villous; anthers softly bearded on the back; pedicels naked. May. *l.* once ternately divided; leaflets ovate-lanceolate, acute, toothed or lobed. Western Temperate Himalayas. A woody, greenhouse climber. (B. M. 4794.) SYN. *C. nepaulensis.*

C. brevicaudata (short-tailed). *fl.* white, small; peduncles spreading, shorter than the leaves, crowded in panicles. *l.* pinnate; leaflets ovate-lanceolate, acuminate, deeply and sharply serrated, and covered with appressed hairs. China and Japan, 1888. Hardy. SYN. *C. Pieroti.*

C. cærulea. The correct name is *C. patens.*

C. californica (Californian). A variety of *C. ligusticifolia.*

C. coccinea (scarlet). A form of *C. Viorna.*

C. Colensoi (Colenso's). *fl.* greenish-yellow, very sweet-scented, 1½in. across; sepals silky; peduncles and pedicels slender. *l.* generally biternate or trifoliolate with the leaflets three-lobed or tripartite; leaflets ½in. to ¼in. long, ovate-cordate. New Zealand, 1844 and 1889. A slender, greenhouse climber. SYN. *C. hexasepala* (B. R. xxxii., t. 44).

C. connata (connate). *fl.* pale yellow; sepals oblong, subacute, not ribbed, pubescent outside, densely tomentose inside; panicles many-flowered. Autumn. *l.* pinnate; leaflets three to seven, distant, 2in. to 4in. long, broadly ovate-cordate, coarsely serrated or almost three-lobed. Himalayas. A large, woody, hardy climber.

Clematis—*continued.*

C. Davidiana (David's). SYN. *C. mongolica* (of gardens). *See under* **C. tubulosa.**

C. divaricata (divaricate). A synonym of *C. eriostemon.*

C. Douglasii (David Douglas's). *fl.* very deep purple inside, pearl outside, nodding; sepals 1½in. long, oblong, erect, spreading, much longer than the stamens. *l.* hairy, twice or thrice pinnatifid; segments linear, rather obtuse. Stem herbaceous, erect, simple, strongly striated, one-flowered. *h.* 1ft. North America, 1889. Hardy.

C. eriostemon (woolly-stamened). *fl.* bluish-violet; sepals oblong-deltoid, acuminate and revolute at apex, the margins undulated; peduncles three-flowered. Summer. *l.* usually pinnate; segments two or three pairs, thick, dark green, oval, the lateral ones entire, the terminal ones irregularly three-lobed. Tendrils wanting. *h.* 3ft. to 3½ft. Probably North America. (R. H. 1852, p. 341.) SYNS. *C. divaricata* (R. H. 1856, p. 341), *C. Hendersoni* (of gardens).

C. Fremontii (Fremont's). *fl.* purple, terminal, nodding; sepals thick, 1in. long, narrow-lanceolate, recurved at tip. *l.* three or four pairs, simple, coriaceous, sparingly villous, sessile, broadly ovate, 2in. to 4in. long, entire or few-toothed. Stems stout, erect, clustered, 6in. to 12in. high, usually branched. Kansas.

C. fusca (fuscous). *fl.* reddish-brown, campanulate, thickly covered with brownish wool. *fr.* forming a thick, globular head of plumose tails about 1in. across. Stems prostrate or climbing to a height of 6ft. or 8ft. China and Japan. A hardy perennial or under-shrub. SYN. *C. kamtschatica.*

C. graveolens (strongly-scented). A synonym of *C. orientalis.*

C. hakonensis (Hakon). *fl.* violet or violet-purple, spreading, 4½in. to 7in. in diameter; sepals four to six, elliptic or ovate-elliptic, narrowed or rounded and mucronate at apex. July to October. *l.* pinnate; leaflets five to seven, ovate, acuminate, rounded at base, very rarely three-lobed, dark green and glabrous above, villous beneath. Japan, 1860. A vigorous twiner. *C. Jackmanni* (of gardens) is one of the varieties of this species.

C. Hendersoni (Henderson's). A form of *C. reticulata.*

C. Hendersoni, of gardens. A synonym of *C. eriostemon.*

C. heracleæfolia (Heracleum-leaved). *fl.* purplish-blue, somewhat resembling those of a Hyacinth in shape; corymbs borne on short, erect peduncles, which, as well as the branches, are velvety-grey. *l.* pinnatisect; segments ovate-lanceolate, broadly incised-toothed, the ultimate ones three-lobed. *h.* 2ft. China. Hardy. SYN. *C. tubulosa.*

C. h. Hookerii (Hooker's). *fl.* lilac, tubular, ⅜in. long, pedicellate, disposed in axillary clusters. *l.* large, pinnately trifoliolate; leaflets elliptic, acute, dentate. North China, 1885. An ornamental, hardy shrub. (B. M. 6801, under name of *C. tubulosa Hookerii.*) *C. tubulosa* is now regarded as a synonym of *C. heracleæfolia.*

C. hexasepala (six-sepaled). A synonym of *C. Colensoi.*

C. Hookeri (Hooker's). A form of *C. tubulosa.*

C. Jackmanni (Jackmann's). A form of *C. hakonensis.* See p. 340, Vol. I.

C. kamtschatica (Kamtschatkan). A synonym of *C. fusca.*

C. ligusticifolia (Ligusticum-leaved). *fl.* white, fragrant, ⅜in. across, dicœcious, borne in paniculate corymbs. *l.* pinnate and ternate; leaflets oblong, acute, mostly lanceolate-cuneate, incisely toothed and trifid. *h.* 30ft. Rocky Mountains. A somewhat pubescent, hardy, more or less shrubby species.

C. l. californica (Californian). This differs from the type in having smaller, somewhat tomentose leaves. 1840.

C. mongolica (Mongol). A garden synonym of *C. Davidiana.*

C. montana. This is one of the most beautiful of spring-flowering subjects (see Fig. 263), but it requires plenty of space.

C. nepaulensis (Nepaul). A synonym of *C. barbellata.*

C. patens (spreading). The correct name of *C. cærulea.*

C. Pieroti (Pierot's). A synonym of *C. brevicaudata.*

C. Pitcheri. *C. Sargenti* is a form of this species.

C. P. lasiostylis (having a woolly style). *fl.* having the recurved portion of the sepals deep purplish-blue. *fr.* of a richer red and larger than in the type.

C. Pitcheri-coccinea (hybrid). A garden hybrid, intermediate in character between the two parents indicated by the name. 1893.

C. recta flore-pleno (double-flowered). *fl.* greenish-white, double, produced in elegant clusters. 1890.

C. reticulata (reticulated). *fl.* dull greenish and purplish, solitary, pendulous, on long peduncles; sepals connivent, recurved at the tips. September. *l.* leathery, prominently reticulated; upper ones simple, elliptic; lower ones pinnate, with

Clematis—*continued.*

seven to nine variable leaflets. Southern United States, 1880. A rambling, hardy or nearly hardy climber. (B. M. 6574.)

C. r. Hendersoni (Henderson's). *fl.* deep bluish-purple, sweet-scented, over 2in. across; sepals wrinkled. June to September. *h.* 8ft. to 10ft.

FIG. 263. CLEMATIS MONTANA.

C. rhodochlora (reddish-green). *fl.* about the size of those of *C. Viticella*; two smaller sepals vinous-red above, paler towards the base, whitish flushed with red beneath; larger sepals nearly double the size of the smaller ones, green, quite foliaceous. *l.* simple, broadly oval or sub-cordate, shortly stalked. 1887. Garden variety.

FIG. 264. FLOWER AND BUD OF CLEMATIS COUNTESS OF LOVELACE.

C. Robertsiana (Roberts's). *fl.* citron-yellow, nodding, 3in. to 5in. in diameter, terminal, solitary, on long peduncles; sepals four, lanceolate. *l.* on rather long petioles, biternately cut; leaflets ovate-lanceolate, 1in. to 2½in. long, mucronate-serrated. Branches slender, 4ft. to 5ft. long. Afghanistan. A sarmentose, hardy shrub.

Clematis—*continued.*

C. Sargenti (Sargent's). This is merely a small-flowered form of *C. Pitcheri*. North America, 1888.

C. Stanleyi (Lord Derby's). *fl.* rosy-white to purple, 2½in. across, cup-shaped, axillary; sepals spreading, broadly-obovate; peduncles one-flowered, longer than the leaves; panicle leafy. *l.* densely set, bi- or tri-pinnately parted, being cut into slender shreds. South and tropical Africa, 1890. A tall, stout, much-branched, greenhouse shrub, clothed in all parts with pale, silky hairs. (B. M. 7166; G. & F. iii., f. 65; G. C. 1890, viii., p. 326, f. 66; Gn. 1891, p. 789.)

C. stans (erect). *fl.* opal-blue, sub-verticillately clustered, pendulous; whorls disposed in a contracted, terminal panicle; sepals linear, acuminate, recurved. September. *l.* trifoliolate; leaflets obliquely roundish-ovate, acute, deeply toothed or somewhat lobed, wrinkled, the upper ones narrower. Stems erect, herbaceous, softly pubescent. *h.* 2ft. to 3ft. Japan. Hardy. (B. M. 6810.)

C. Suksdorffii (Suksdorff's). This little-known, hardy species of the *Flammula* section "resembles in habit and foliage the widely-distributed and variable *C. ligusticifolia*." North-West United States, 1896. (G. & F. 1896, p. 255, f. 36.)

C. texensis (Texan). A synonym of *C. Viorna coccinea*.

C. verticillaris is the correct name of *Atragene americana*.

C. Viorna coccinea. SYN. *C. texensis.* The garden variety *luteola* has the flowers yellow inside; in *parviflora* they are reddish inside and smaller. 1888. (R. H. 1888, p. 348.)

Varieties. Many new varieties have been added since those enumerated in Vol. I. appeared, but the following selections include the best:

ALBA MAGNA, pure white, with purplish-brown anthers, a lovely variety, free, and hardy; BARILLET DESCHAMPS, large double flowers of a mauve colour, with yellow stamens; BEAUTY OF WORCESTER, bluish-violet, with conspicuous white stamens, very beautiful, hardy, and a continuous blossomer from July to October; BELLE OF WOKING, silvery-grey, large double flowers; COUNTESS OF LOVELACE, bluish-lilac (Fig. 264); DUCHESS OF TECK, pure white, shaded with mauve on first opening; EDOUARD DESPOSSE, deep mauve, with red anthers, large, free, and fine; GLOIRE DE ST. JULIEN, white, flushed with mauve, large, and free; LA FRANCE, deep violet-purple, remarkably free and good; PRINCESS BEATRICE, silvery-lilac, of great size and substance, very fine, June to October; REINE BLANCHE, light mauve, excellent for bedding; SMITH'S SNOW-WHITE JACKMANII, pure white, constant blossomer from July to October.

CLEOME. Bentham and Hooker include *Peritoma* (p. 30, Vol. III.) under this genus. Several species formerly included here are now referred to **Polanisia.**

CLEOPHORA. A synonym of **Latania** (which *see*).

CLERODENDRON. SYN. *Agricolæa.* Including *Cyclonema.* This genus comprises about seventy species, most of them broadly dispersed over the warmer regions of the globe; a few are natives of America (mostly in the West Indies or Colombia), and one is broadly diffused over the maritime regions of tropical America.

The hardy varieties of *Clerodendron* flourish in ordinary garden soil, but the best results are obtained when they are grown in a compost of rough peat and fibrous loam. A sunny spot sheltered from east winds and late spring frosts should be selected. During the growing season, and especially if the soil is naturally dry, copious supplies of water should be given to the plants. *C. trichotomum* may be propagated by division of the roots, the thick, fleshy portions of which should be cut into short lengths and placed in pans of light soil in heat.

To those described on pp. 341-2, Vol. I., the following should be added. They require stove treatment.

C. Balfouri (Balfour's). A variety of *C. Thomsonæ.*

C. cephalanthum (flowers in heads). *fl.* disposed in dense, terminal heads; calyx purplish, large, five-lobed; corolla creamy-

Clerodendron—*continued.*

white, with a narrow tube 3in. to 4in. long and spreading segments; stamens much exserted. *l.* large, ovate, dark green; petioles hardening and forming stout hooks. Stems brown. Zanzibar, 1888. Climber.

C. delectum (chosen). *fl.* showy, freely produced in large, dichotomous cymes; calyx pure white; corolla of a deep, rich magenta-rose. 1885. A handsome garden variety, raised from *C. Thomsonæ Balfouri.*

C. grandiflorum (large-flowered). The correct name of *Ægiphila grandiflora.*

C. illustre (bright). *fl.*, calyx reddish-scarlet, sub-globose; corolla bright scarlet, the tube ¾in. long, the limb eight to nine lines in diameter; panicle branches and pedicels red. *l.* cordate, acute, 7in. to 8in. long, 6in. to 6½in. broad, repand-toothed, glabrous or nearly so above, scaly beneath. Celebes. A showy plant, producing its large panicles of flowers when only 1½ft. high.

C. macrosiphon (long-tubed). *fl.* forming a small, sub-sessile, terminal, reduced cyme; calyx ¼in. long; corolla white, the tube 4in. to 4½in. long, ⅓in. in diameter, hairy, erect, slightly curved; limb one-sided, 1½in. in diameter, five-lobed to the middle. May. *l.* 2in. to 3in. long, oblanceolate or elliptic-lanceolate, acuminate, coarsely and irregularly toothed or almost lobulate, the base gradually narrowed into a petiole. Zanzibar, 1881. A slender, erect shrub. (B. M. 6695.) SYN. *Cyclonema macrosiphon.*

C. Minahassæ (Minahassa). *fl.* yellowish-white, in broad, terminal, cymose panicles; anthers purple, exserted. *fr.* very ornamental, the calyx growing out so as to resemble a red flower 3in. across, with a round, blue berry in the centre. *l.* opposite, obovate, serrated. Stems square. Celebes, 1886. An ornamental shrub.

C. nutans (drooping). *fl.* white, scented, slightly ascending, ternate; calyx reddish-purple; corolla lobes obovate, obtuse, almost equal, flat; stamens longer than the corolla; panicles oblong, loosely pendulous. December. *l.* ternate or opposite, long-acuminate, entire, attenuated at base, very shortly petiolate. *h.* 2ft. to 4ft. Sylhet, &c., 1830. Shrub. (B. M. 3049.)

C. Rumphianum (Rumphius'). *fl.* at first flesh-coloured, deepening to red and crimson, long-tubed, in terminal panicles; stamens red, exserted. *l.* large, roundish-ovate, dark green. Java, 1887. A handsome shrub.

C. scandens (climbing). A synonym of *C. umbellatum.*

C. sinuatum (sinuate). *fl.* shortly pedicellate, disposed in an ample, capitate, compact panicle; corolla pure white, salver-shaped, the slender tube thrice as long as the calyx. February. *l.* petiolate, ovate or ovate-oblong, sub-cordate at base, acuminate at apex, lightly sinuate or angled. Branches copious, tetragonal, slender. *h.* 3ft. Sierra Leone, 1846. A pubescent shrub. (B. M. 4255.)

C. Thomsonæ Balfouri (Balfour's). *fl.* light crimson; calyx rather larger than in the parent. 1885.

C. umbellatum (umbelled). *fl.* few, in a terminal panicle; corolla whitish, reddish at the throat, the tube slender, 1in. long, the limb segments rather large, acute. July. *l.* oval, entire, 3in. long, 1in. broad, coriaceous, petiolate, acute, shining above, yellowish beneath. Stems twining, four-angled, highly glabrous, striated. *h.* 12ft. Western Tropical Africa, 1822. SYN. *C. scandens* (B. M. 4354).

C. viscosum is identical with *C. infortunatum.*

CLETHRA. This genus embraces about twenty-five species, natives of North and South America, Madeira, Japan, and the Malayan Archipelago. Leaves sparse, persistent or rarely deciduous, petiolate, entire, serrated, or toothed. To the species described on p. 342, Vol. I., the following should be added:

C. barbinervis (bearded on the nerves). *fl.* white, in a terminal, elongated, paniculate raceme; rachis, peduncle, and calyx rusty-pubescent *l.* petiolate, obovate or obovate-elliptic, acute, cuneate at base, argutely serrated, glabrous above, the under-surface bristly-pubescent on the primary veins and bearded in the axils of the veins. Japan, 1870. Hardy, deciduous.

C. canescens (hoary). *fl.* white, small, disposed in large, branching panicles, slightly fragrant. *l.* deep green, lanceolate. Java, 1896. A strong-growing shrub.

C. secundiflora (side-flowering). *fl.*, calyx segments obtuse, silky-pubescent; inflorescence side-flowering; pedicels and peduncles tomentose. *l.* oblong-lanceolate, denticulate, entire at base, shortly acuminate, glabrous above, below (as well as the petioles) hairy-pubescent. Habitat not recorded, 1877.

CLETHROPSIS. Included under **Alnus** (which *see*).

CLEYERA. Of the six species included hereunder, two are Indian or Japanese, and the rest are found in Mexico or in the Antilles. To those described on p. 183, Vol. I., the following should be added:

C. Fortunei (Fortune's). *fl.* about ½in. in diameter, solitary or fascicled in the axils or on nodes; calyx lobes reddish-brown;

Cleyera—*continued.*

petals pale yellow. September. *l.* 4in. to 6in. long, elliptic- or linear-lanceolate, bright green, variegated with golden-yellow and scarlet towards the margins. Japan (?), 1861. (B. M. 7434; G. C. 1895, ii., p. 10, f. 1.)

CLIANTHUS. *Donia* (of G. Don) is synonymous with this genus. *C. carneus* is synonymous with *Streblorhiza speciosus.*

CLIDANTHUS. *See* **Chlidanthus.**

CLIDEMIA. SYN. *Staphidium* (for the most part). *C. vittata* is the only species calling for mention here. For culture, *see* **Melastoma.**

C. vittata (striped).* *l.* elliptic, 8in. to 12in. long, 8in. broad, bullate and of an intense green above, with a very distinct silvery central stripe, beneath reddish-tomentose; petioles cylindrical, sulcate above, 2in. long, powdered. Stem and branches terete, robust, softly reddish-tomentose. Peru, 1873. A very ornamental plant. (I. H. n. s., xxii., t. 219.)

CLIFF BRAKE FERN. *See* **Pellæa.**

CLIFTONIA LIGUSTRINA. According to Bentham and Hooker, this is the correct name of *Mylocarium ligustrinum.*

CLIMBING CUCUMBER. *See* **Cyclanthera pedata.**

CLIMBING HYDRANGEA. *See* **Schizophragma hydrangeoides.**

CLINANTHUS. The original spelling of *Clitanthus*, now included under **Stenomesson** (which *see*).

CLINGSTONE. A term applied to Peaches and similar fruits, the flesh of which is not easily separable from the stone.

CLINOSTYLIS. A synonym of **Gloriosa** (which *see*).

CLINTONIA. SYN. *Xeniatrum.* Eight species are included in this genus: two are found on the Himalayas, in Siberia, and in Japan, and the remainder are North American. Flowers in terminal umbels or racemes, rarely solitary; perianth funnel-shaped, deciduous, with six sub-equal segments; stamens six, inserted at the base of the segments. Leaves sub-radical, narrow, ribbed.

C. pulchella (rather pretty). A synonym of *Downingia pulchella.*

CLIOCOCCA TENUIFOLIA. Included under **Linum** (which *see*).

CLIPPING HEDGES. Deciduous Hedges may with advantage be clipped once or twice during the growing season; if this is done with Beech Hedges they retain their foliage all winter, and make an excellent screen. Box Hedges may be clipped in the early autumn or spring. Holly Hedge, Laurels, and similar large-leaved plants should be trimmed with a knife.

CLITANTHUS [originally spelt *Clinanthus.*] Included under **Stenomesson** (which *see*).

CLITORIA. SYN. *Nauchea.* About twenty-seven species, scattered over the warmer parts of the globe, form this genus. Standard spoon-shaped, very large; wings and the incurved keel much shorter.

C. braziliana. The correct name is *Centrosema brasilianum.*

C. Broussonetii (Broussonet's). A synonym of *Cologania Broussonetii.*

C. multiflora (many-flowered). A synonym of *Vilmorinia multiflora.*

C. polyphylla (many-leaved). A synonym of *Barbiera polyphylla.*

C. virginiana (Virginian). A synonym of *Centrosema virginianum.*

CLIVEUCHARIS PULCHRA. A name given by M. E. Rodigas to a hybrid raised in M. Van Houtte's nursery out of a *Clivia* by the pollen of *Eucharis amazonica.*

CLIVIA. *Imantophyllum* is included by modern botanists under this genus, but for horticultural purposes it has been kept distinct in this work. Flowers bright reddish-yellow, scentless, many in an umbel; perianth funnel-shaped, erect or rather curved, the tube short, the

Clivia—*continued.*

segments ascending, sub-equal, obtuse; stamens inserted at the throat. Leaves numerous, distichous, persistent. Bulb imperfect, consisting only of the leaf-bases.

Varieties. ACQUISITION, orange-scarlet; ADMIRATION, a combination of creamy-white and orange-scarlet; AMBROISE VERSCHAFFELT, orange-red; CRUENTA, orange-red; DISTINCTION, orange-red, with white base; FAVOURITE, light orange-yellow, with paler throat; LADY WOLVERTON, orange-yellow; MDLLE. MARIE VAN HOUTTE, orange-scarlet, with deep yellow centre; METEOR, orange-scarlet; OPTIMA, orange-scarlet, banded with yellow, very large flowers; PRESIDENT, bright orange; STANSTEAD BEAUTY, soft orange; SUPERBUM, orange-red.

CLOT BUR. *See* **Xanthium.**

CLOVE. A small bulb, springing from the axils of the scales of a larger bulb; *e.g.*, a Clove of Garlic.

CLOVER, CALVARY. *See* **Medicago Echinus.**

CLUBBING and **CLUB-FOOT.** A disease of Cabbage and other *Cruciferæ* due to one of the so-called "Slime Fungi," *Plasmodiophora brassicæ*. *See* **Finger and Toes.**

CLUB GRASS. *See* **Scirpus.**

CLURAS. Although *C. miniata* is still much grown, yet some of the garden varieties surpass it for general excellence. Some of the best of these are Acquisition, Admiration, Distinction, Favourite, Lady Wolverton, Mdlle. Marie Van Houtte, Optime, President H. Rohan, and Van Houttei. Those who do not want named varieties will find in the seedlings some extremely beautiful kinds.

CLUSIA. About sixty species, all tropical or subtropical American, are included in this genus. Flowers dicœcious or polygamous, borne at the tips of the branches; sepals four to six; petals four to nine. To the species described on p. 344, Vol. I., the following should be added:

C. venosa (veined). *fl.* white or purplish, shortly pedicellate; petals four, about ¾in. long; peduncles three- to five-flowered. *fr.* reddish, berry-like, ovoid, with resinous pulp. *l.* 3in. to 4in. long, rounded or almost truncate at the top, veined on both sides, sub-sessile. *h.* 30ft. West Indies, 1733.

CLUSIACEÆ. Lindley's name for the **Guttiferæ** (which *see*).

CLUSTER. A popular term for bunches of Grapes, Currants, flowers, &c., but having no definite significance.

CLUSTER CUPS. *See* **Æcidium.**

CLUTIA. *See* **Cluytia.**

CLYNHYMENIA. A synonym of **Cryptarrhena** (which *see*).

CLYPEA. A synonym of **Stephania** (which *see*).

CLYTIA is also spelt *Clutia*. SYN. *Altora*.

CNEMIDIA. A synonym of **Tropidia** (which *see*).

CNICUS. Horse Thistle; Plumed Thistle. Most of the species are found in temperate Asia, Europe, North Africa, and America, a few being broadly dispersed. To those described on p. 345, Vol. I., the following should be added. *See also* **Chamæpeuce** (which is included hereunder by Bentham and Hooker).

C. oleraceus (pot-herb). *fl.-heads* whitish or yellowish-white; involucral scales linear-lanceolate, acute, almost unarmed. July. *l.* amplexicaul-cordate, spiny-ciliated, and, as well as the branches and stem, glabrous; lower ones pinnatifid; upper ones ovate, acute. *h.* 3ft. Europe, 1570. SYN. *Cirsium oleraceum*.

C. rhizocephalus (rooting-headed). *fl.-heads* yellowish, stemless. *l.* very spiny, hairy. Caucasus, 1897. SYN. *Cirsium rhizocephalum*.

C. Velenovskyi (Velonovsky's). *fl.-heads* red, beautiful, large, and numerous. *l.* during the first year very much like those of *Chamæpeuce diacantha*. Stems 4½ft. high. 1896. A hardy biennial. SYN. *Cirsium Velenovskyi*.

C. Provosti has also been introduced.

CNICUS (of Gærtner). A synonym of **Carbenia** (which *see*).

CNIDIUM. A synonym of **Selinum** (which *see*).

COAL. When within reasonable distance of the Welsh collieries, Anthracite Coal is probably the most economical fuel to use. It produces great heat with very little attention, is clean, smokeless, and, in addition, burns much longer than ordinary Coals.

COAL-ASHES. For heavy or tenacious soils these, if screened through a fine sieve before applying to the land, are valuable; they also act as gentle fertilisers, as they contain several forms of plant-food. On light land, Coal-Ashes are not advisable, as they would render it still lighter.

COBAMBA. A synonym of **Canscora** (which *see*).

COCCANTHERA. A synonym of **Codonanthe** (which *see*).

COCCINELLIDÆ. *See* **Beetles.**

COCCINIA. According to Bentham and Hooker, this is a synonym of **Cephalandra** (which *see*).

COCCOCYPSELUM [also spelt *Coccocipselum*]. SYNS. *Condalia*, *Lipostoma*. About sixteen species, confined to tropical America, are included in this genus. Berries blue, small, ovoid, two-celled, sometimes two-parted, many-seeded. To the species described on p. 346, Vol. I., the following should be added:

C. buxifolium (Box-leaved). A synonym of *Fernelia buxifolia*.

C. discolor (two-coloured). This species only differs from *C. campanuliflorum* in its fruit, which is a berry of an intense blue, crowned by the calyx. Brazil, 1882.

C. hirsutum (hairy). *fl.* sessile, six to eight in a head; corolla pale violet. *fr.* dark violet, ellipsoid, ⅜in. long, hairy, crowned with the subulate calyx-teeth. *l.* rather long-stalked, roundish-ovate, convex above, tinged with purple beneath. Stems prostrate, at length ascending. Central America, &c., 1860. Plant clothed with spreading hairs. (B. M. 7278.) SYN. *C. repens*, of Morren (B. H. 1866, p. 194, t. xiii., xiv., f. 3 to 5).

C. repens (of Morren). A synonym of *C. hirsutum*.

C. Tontanea (Tontanea). *fl.* white or blue; anthers shortly exserted; heads axillary, pedunculate, three- to five-flowered. *fr.* pretty. *l.* ovate, somewhat acute, hairy-pubescent. Cayenne, &c.

COCCOLOBA. Nearly eighty species of trees or shrubs (sometimes tall-climbing), all American, and mostly tropical, are included in this genus. Flowers shortly pedicellate, spicate-racemose; racemes simple or panicled, terminal or axillary. Leaves alternate, entire. To the species described on p. 346, Vol. I., the following should be added:

C. macrophylla (large-leaved). A synonym of *C. rugosa*.

C. platyclada (flat-branched). A synonym of *Muehlenbeckia platyclada*.

C. rugosa (wrinkled). *fl.* bright red, in a very dense, terminal, sub-sessile, erect raceme, 2ft. or more in length. July. *l.* distant, alternate, 1ft. or more in length, cordate-ovate, sessile, strongly nerved, wrinkled. Stem erect, simple or scarcely divided, 20ft. to 30ft. high, leafy from below to the top. Probably South America. SYN. *C. macrophylla* (B. M. 4536).

COCCOTORUS SCUTELLARIS. *See* **Plum Insect Pests.**

COCCULIDIUM. A synonym of **Cocculus** (which *see*).

COCCULUS. SYNS. *Cebatha*, *Cocculidium*, *Epibaterium*, *Leæba*, *Wendlandia* (of Willdenow). This genus includes about ten species, inhabiting the warmer parts of North America, Africa, and Asia.

COCCUS VITIS. *See* **Vine Scale Insects.**

COCHLEARIA. Includes *Armoracia* and **Ionopsidium** (which *see*), according to Bentham and Hooker.

COCHLIODA (from *kochlion*, a little snail; in reference to the curiously-shaped callus). ORD. *Orchideæ*. A genus embracing about ten species of stove or greenhouse, evergreen, epiphytal Orchids, natives of the Andes. Flowers often red, disposed in loose racemes, pedicellate; sepals equal, spreading, free, or the lateral ones more or less connate; petals nearly similar; claw of the lip erect, the lamina spreading, the lateral lobes round and often reflexed, the middle one narrow, entire or emarginate, not exceeding the sepals; column erect, often slightly incurved; scapes one or two, springing from under the pseudo-bulbs. Leaves oblong or narrow, coriaceous, contracted into the

Cochlioda—*continued.*

petioles. Pseudo-bulbs one- or two-leaved. The species here described should be grown in baskets suspended from the roof of the cool-house. Peat and moss form the most suitable compost; and abundance of water during the growing season is essential. Propagation may be effected by division of the pseudo-bulbs.

C. miniata (scarlet). This is supposed to be a natural hybrid between *C. Noezliana* and *C. vulcanica*. (L. 1897, t. 562.)

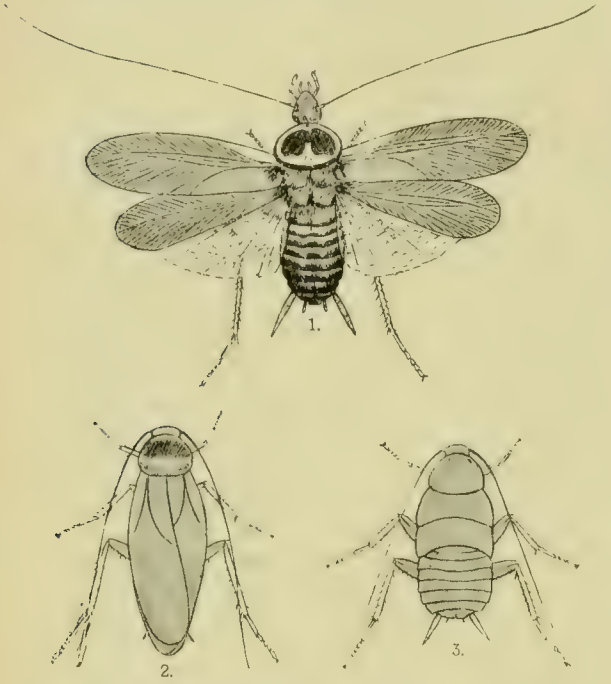

FIG. 265. PERIPLANETA AUSTRALASIÆ. 1, Imago (wings expanded); 2, Imago (wings closed); 3, Immature.

C. Noezliana (John Noezli's). *fl.* orange-scarlet, about 1in. across, with the disk of the lip yellow; lateral sepals narrower and longer than the dorsal one and petals; lip three-lobed, the middle lobe bluntly-obcordate; column triquetrous, dark; peduncles nodding or pendulous, racemose, many-flowered. *l.* linear-oblong, acute, 4in. to 6in. long. Pseudo-bulbs 1½in. to 2in. long, one-leaved. South America, 1891. (L. v., t. 266.) SYN. *Odontoglossum Noezlianum.* There is a form *aurantiaca*, with yellower flowers than in the type. 1896.

C. rosea (rosy). *fl.* wholly rosy-carmine, except the white tip of the column, about 1in. across; sepals and petals oblong-elliptic; lip cuneate at base, the small lateral lobes inclosing the disk, which bears a four-lobed callus, the middle one longer, linear, dilated at the end; racemes drooping, twelve- to twenty-flowered. Winter. *l.* ligulate-oblong. Pseudo-bulbs green, tinted violet, ovate, two-edged. Peru, 1851. SYNS. *Mesospinidium roseum, Odontoglossum roseum* (B. M. 6084; I. H. ser. iii. 66).

C. sanguinea (bloody). *fl.* numerous, bright rose-coloured, waxy in appearance; racemes slender, drooping, slightly branched. Summer and autumn. *l.* two, cuneate-ligulate. Pseudo-bulbs oval, compressed, banded with mottled brown. Peru and Ecuador, 1867. SYN. *Mesospinidium sanguineum* (B. M. 5627).

C. stricta (erect). *fl.* rose-coloured, numerous, erect, smaller than those of *C. rosea* (which they otherwise resemble); peduncle slender, erect. *l.* narrow, acute. Pseudo-bulbs ovate, compressed, bronzy-green. Colombia, 1897.

C. vulcanica (volcanic). *fl.* about 2in. across; sepals and petals dark rose; lip bright rose in front, paler on the disk, where there is a four-keeled callus; the side lobes roundish, the middle one emarginate; racemes unilateral, erect, twelve- to twenty-flowered; peduncle slender, erect. *l* oblong, keeled, 3in. to 5in. long. Pseudo-bulbs ovoid, compressed, more or less two-edged. Eastern Peru, 1872. SYN. *Mesospinidium vulcanicum* (B. M. 6001).

C. v. grandiflora (large-flowered). *fl.* deep rose-coloured, in racemose spikes, larger than in the type. 1893

COCHLOSPERMEÆ. Included under **Bixineæ** (which *see*).

COCHLOSPERMUM. *Azeredia, Maximiliana,* and *Wittelsbachia* are synonymous with this genus.

COCKCHAFERS (*Melolontha vulgaris*). These well-known Beetles seem to be on the increase, or perhaps their depredations are oftener brought home. As stated in Vol. I. they are most undesirable insects in the garden and park; but they are equally objectionable in the orchard and on the farm. As Beetles they feed upon the foliage of nearly all our deciduous shade-trees, as well as upon various fruit trees; while as grubs they are notoriously destructive to grass roots, corn roots, the commoner field crops grown for their roots, nursery beds containing seedlings, and even upon Strawberry-roots. On the Continent, more particularly in France and Germany, the Fir plantations suffer from their ravages, and, with all the insecticides available, man is largely dependent upon the birds and the bats for preserving the requisite balance, especially in the case of grass land.

In addition to the methods for their destruction recorded in Vol. I., gardeners and farmers should try beating the trees in infested districts over tarred boards. This is best done early in the day, when the pests may be found on the under-surfaces of the foliage. They are readily dislodged and should be collected and destroyed.

COCKLE BUR. *See* **Xanthium.**

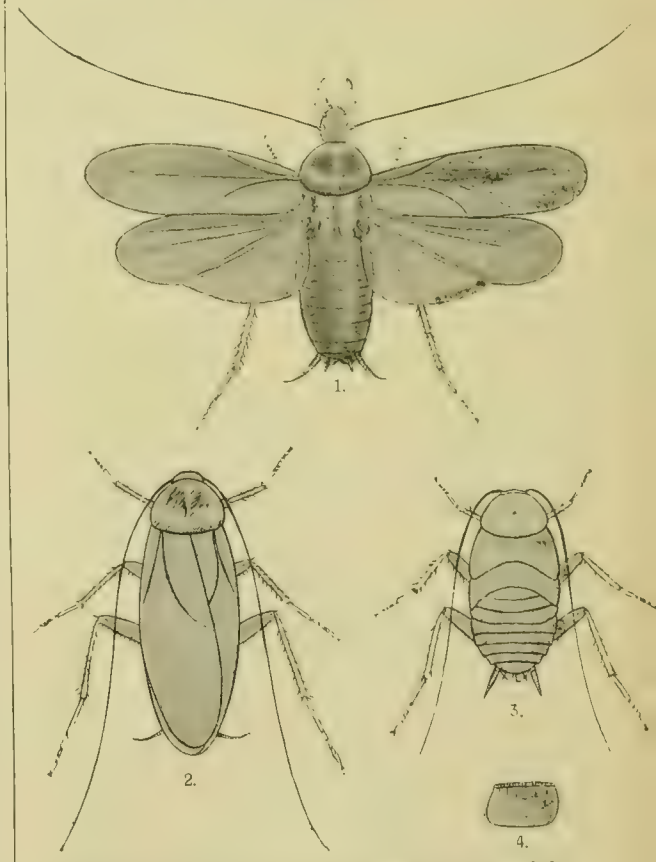

FIG. 266. PERIPLANETA AMERICANA. 1, Imago (wings expanded) 2, Imago (wings closed); 3, Immature; 4, Ootheca (egg-case).

COCKROACHES are Orthopterous insects, doing much damage to fruits under glass, choice flowers (like Orchids), the fronds of Ferns, and many other plants. In vineries they are exceedingly troublesome at times, feeding upon

Cockroaches—*continued.*

the shoots, stems, and footstalks. Twenty years ago the only species that could be characterised as a pest was the Common Cockroach, *Stylophaga* (*Periplaneta*) *orientalis*, which holds its midnight revels in kitchens. More recently, owing to an interchange of commerce, several other species have established themselves in goodly numbers, the heated structures found in gardens generally affording them the necessary warmth. At Kew and many other places where plants are constantly being received from abroad, numbers are taken. In the Palm House and in the forcing-pits at Kew, *P. australasiæ* is reported as doing much damage by attacking young shoots and axillary buds.

The newcomers are: *Periplaneta australasiæ*, already noted (Fig. 265); *P. americana* (Fig. 266); *Phyllodromia germanica* (Fig. 267), the Croton Bug of America;

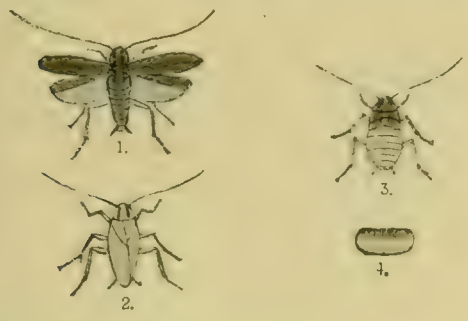

FIG. 267. PHYLLODROMIA GERMANICA. 1, Imago (wings expanded); 2, Imago (wings closed); 3, Immature; 4, Ootheca.

Rhyparobia (*Panchlora*) *maderæ* (Fig. 268); and *Leucophæa surinamensis* (Fig. 269). The first three are the commonest, the last two being but occasionally met with. First as to

Cockroaches—*continued.*

Cockroaches generally take a long time to arrive at maturity—five years, but *P. germanica* is an exception, arriving at maturity in about nine months. They are very difficult to exterminate once they have established themselves, so well are their ootheca (egg-cases) protected.

In addition to the insecticides mentioned in Vol. I., Snow's Magic Paste may be named. We have found this very effective.

FIG. 269. LEUCOPHÆA SURINAMENSIS (showing mature and immature insect).

COCKSCOMB. This name is applied to *Erythrina Crista-galli* and *Rhinanthus Crista-galli*, as well as to the genus *Celosia*.

COCKSPUR FLOWER. *See* **Plectranthus.**

COCKSPUR, WEST INDIAN. *See* **Pisonia aculeata.**

COCKTAIL BEETLES. *See* **Staphylinidæ.**

COCOA PLANT. *See* **Theobroma Cacao.**

COCOA ROOTS. A common name for the roots of *Caladium bicolor* and some other species of that genus.

COCO DE MER. *See* **Lodoicea.**

COCOS. Including *Glaziova*. Upwards of thirty species have been described, natives of tropical and sub-tropical America. Spadices erect, at length drooping; lower spathe

FIG. 268. RHYPAROBIA (PANCHLORA) MADERÆ (showing insect with expanded and unexpanded wings).

P. australasiæ: This is larger than *S. orientalis*, and has perfect wings in both sexes, whereas our kitchen pest is only winged in the case of the males. In colour it is a red-brown, with a yellow streak along the costal margin of the fore-wing at the basal half; the *pronotum* is almost black, but has a yellow margin. *P. americana* is also fully winged (see Fig. 266), and is minus the yellow markings found upon *P. australasiæ*; it is also larger. *P. germanica* is the smallest of the Cockroaches named above, being only about half the size of *S. orientalis*. It is variable as to colour, but usually some shade of light brown, and is winged in both sexes. So far, *P. germanica* has not invaded our plant-houses to the extent of the other two species; but inasmuch as Cockroaches generally are practically omnivorous, they must all be regarded as undesirable visitors.

the shorter, cleft at apex, the upper one fusiform or clavate, woody, sulcate at back. To the species described on pp. 348-9, Vol. I., the following should be added. *See also* **Syagrus** (which is included by botanists under *Cocos*) and **Acrocomia.**

C. Blumenavi (Blumenhaav's). A synonym of *C. eriospatha.*

C. butyracea (buttery). *fl.*, spadices as long as the spathe; branchlets simple, thickly clustered, 1ft. long, deflexed; spathe cylindrical-oblong, attenuated at both ends, 4ft. to 6ft. long. *l.* pinnate; pinnæ simple. Colombia, 1850. Plant unarmed.

C. capitata (headed). *fl.*, spadix long-pedunculate, the branches 4in. to 5in. long; spathe narrow-fusiform, 1½ft. to 2ft. long, sulcate. *l.* spreading, 6ft. or more in length, forming a dense head; pinnæ straight, sub-erect, complicate, linear, acuminate, rigid, glaucous beneath. Caudex thick, 10ft. to 12ft. high. Minas Geraes.

Cocos—*continued.*

C. Datil (native name). *fl.*, spadix 4ft. or more in length, with as many as 300 branches, and borne on a peduncle 16in. long; spathe incurved, beaked. *l.* 12ft. to 16ft. long; pinnæ linear, acuminate; sheath about 16in. long. Caudex tall, 4in. to 12in. in diameter, naked, narrowly-annulate. Argentine, 1889.

C. criospatha (woolly-spathed). *fl.*, spadix thick, contracted; rachis 8in. to 10in. long; branches sixty to ninety; spathe thick and woody above, ending in a long point, pale fuscous within, softly fuscous-woolly outside. *l.* longer than in *C. capitata*, pectinate, glaucescent; lower segments 1½ft. to 2ft. long, elongated, linear, very long-acuminate, the upper ones narrow-linear, all rigid. Caudex dwarf or tall. Brazil, 1889. SYN. *C. Blumenavi.*

FIG. 270. COCOS WEDDELIANA.

C. flexuosa (bending). *fl.*, spadix 1½ft. to 2ft. long, long-pedunculate; spathe 1½ft. long, woody, glabrous, deeply sulcate, fusiform, shortly beaked. *l.* somewhat crisped, about 6ft. long, lightly arcuate-spreading; segments seventy to ninety on each side, linear, acuminate-cuspidate, densely aggregated in twos or threes, the central ones 10in. to 14in. long. Caudex usually tall, rarely dwarf, flexuous, squamate with the persistent bases of the two-edged petioles. Brazil.

C. graminifolia (Grass-leaved). *fl.*, spadix 20in. to 28in. long; lower spathe very short, the upper one very narrow, fusiform, obtusely beaked; peduncle long, slender, compressed. *l.* slender, erecto-arcuate, crisped, 3ft. long; segments thirty to forty on each side, 8in. to 10in. long, about ¼in. broad, acuminate. Plant almost stemless. Brazil.

C. leiospatha (smooth-spathed). *fl.*, spadix 1½ft. or less in length, slender; spathe slightly woody, smooth on both surfaces.

Cocos—*continued.*

l. glaucous, 3ft. long, shortly petiolate; segments equidistant, linear, acuminate. Caudex dwarf, thick, naked below, with a densely-congested mass of persistent petioles towards the top. Brazil.

C. Marie Rose. A garden name for *C. Procopiana.*

C. Normanbyi (Normanby's). A synonym of *Ptychosperma Normanbyi.*

C. odorata (scented). *fl.*, spathe cylindrical, elongated, apiculate. *fr.* drupe-like, sub-globular, yellowish-green or pink, pulpy, scented. *l.* arched; leaflets in threes or fives, linear-lanceolate, conduplicate, acute, coriaceous, glaucescent beneath; petioles spiny. Stem short. South America, before 1893. (R. H. 1893, p. 346, *f.* 110.)

C. oleracea (pot-herb). *fl.*, spadix 1½ft. to 2ft. long, at first erect, then spreading or nodding; spathe 1½ft. to 2ft. long, longitudinally sulcate, tomentose outside when young. *l.* dense, 6ft. to 8ft. long; pinnæ linear, somewhat falcate, acute, obliquely adnate, slightly crisped, glaucous beneath. Caudex 60ft. to 80ft. high. Brazil, 1846. The buds are used economically by the natives.

C. petræa (rock-loving). *fl.*, spadix variable in size, usually about 1ft. long, the rachis simple or very rarely divided into two or three branches; lower spathe shortly two-winged, the upper one woody, fusiform-rostrate. *l.* few, slender, 1½ft. to 3ft. or more in length, shortly petiolate; segments aggregated in twos or threes, solitary towards the apex, linear, acuminate. Plant usually almost stemless. Brazil, Bolivia, &c., 1889.

C. Procopiana (Marianna Procopio Ferriera's). *fl.*, spadix 16in. long; spathe thickened, woody, narrow-fusiform. *l.* fifteen to twenty crowded in a dense head; segments usually in threes or fours, crisped, spreading, the lower ones 2ft. long and scarcely ⅛in. broad, the upper ones shortened. Caudex about 15ft. high. Brazil. SYN. *C. Marie Rose* (of gardens).

C. Pynaerti (Pynaert's). A seedling variety of *C. Weddeliana.*

C. Weddeliana Pynaerti (Pynaert's). *l.* gracefully arched; pinnules rather broader and more closely placed than in the species, which is shown in Fig. 270.

C. Yatay (native name). *fl.*, spadices 4½ft. long, drooping; lower spathe 2ft. long, coriaceous, the upper one 4½ft. long, longitudinally dehiscent above the middle. *l.* much crowded, 6ft. to 10ft. long, revolute-spreading, long-sheathing; segments fifty to sixty on each side, at length equidistant, linear, acuminate, the middle ones 3ft. long and ¼in. broad, the uppermost ones filiform; petioles spiny-serrated. Caudex 12ft. to 15ft. high and more than 1ft. in diameter, densely squamate with the petiole-bases above. Brazil.

The following species have also been introduced, but are at present very rare in cultivation: *C. Bonneti, C. insignis, C. odorata, C. Yurumaguas.*

CODAMBA. A synonym of **Canscora** (which *see*).

CODAZZIA. A synonym of **Delostoma** (which *see*).

CODIÆUM. According to the authors of the "Genera Plantarum," the number of distinct species is only four, and they are found in the South Pacific Islands, Australia, and the Malayan Archipelago. The garden varieties, however, are very numerous. To those described on pp. 350-5, Vol. I., the following should be added:

C. appendiculatum (having an appendage). *l.* having a terminal lobe borne on a filiform production of the midrib. Polynesia, 1875.

C. aureo-lineatum (golden-lined). *l.* green, with the exception of the margins and a line from the midrib, which are yellow. Fiji, 1878.

C. aureo-marmoratum (gold-marbled). *l.* 1ft. long, 3in. broad, dark olive-green, marbled with yellow. 1884.

C. aureo-punctatum (gold-dotted). *l.* linear, obtuse, bright green, dotted and spotted with yellow. 1883. A small form.

C. Austinianum (Austin's). *l.* erect, 6in. to 9in. long, 2in. broad, blotched and margined with creamy-white and suffused with pink, the margins undulated. 1883. A compact form, of dwarf, branching habit.

C. Beauty. *l.* lanceolate, green, variegated golden-yellow, the ground-colour eventually becoming a deep bronze, while the yellow variegations change into a rich rosy-crimson. South Pacific, 1887.

C. Bismarcki (Bismarck's) *l.* of a deep green, veined and blotched with yellow. Polynesia, 1876.

C. Bragæanum (José Terceiro Da Silva Braga's). *l.* pendulous, linear-lanceolate, 1½ft. to 1¾ft. long; many of the young ones pale yellow, marbled and mottled light green; others green, spotted golden-yellow; mature ones deep olive-green, spotted and speckled bright yellow, the midribs crimson. 1882.

Codiæum—*continued.*

C. Broomfieldii (Broomfield's). *l.* 9in. to 10in. long, 2in. to 2½in. wide, dark green, lined, spotted, blotched, and margined yellow, and having a central band of the same colour; midrib tinted red. 1887.

C. Bruce Findlay. *l.* large, oblong-ovate, freely variegated with yellow on the lines of the midrib and principal veins. 1882. A bold and handsome plant.

C. caudatum-tortile (twisted-tailed). *l.* pendulous, twisted, some of them deep olive-green, with a yellow central band and a crimson midrib; others almost wholly yellow, becoming suffused with crimson; others variously blotched and spotted. 1883. A graceful form.

C. contortum (twisted). *l.* ovate, acuminate, recurved, 6in. to 8in. long, having the cross-veins and margins sulphur-yellow on an olive-green ground. 1884. This plant resembles *C. volutum.*

C. cornigerum (horn-bearing). *l.* banded with orange-yellow. Polynesia, 1873.

C. Crœsus. *l.* oblong-lanceolate, bright green, blotched with yellow. 1883.

C. cronstadtii (Kronstadt). *l.* of medium size, lanceolate, twisted, curled, and crisped, tapering to a sharp point, deep, glossy green, variegated with light golden-yellow. 1882. An interesting plant.

C. Dayspring. *l.* oblong-elliptic, orange-yellow, edged dark green, the yellow parts becoming tinged with red on the older leaves. 1882.

C. Delight. *l.* oblong, acute, 6in. to 8in. long, 1¼in. to 2in. broad, when young bright yellow, margined green, the midrib and primary veins creamy, the central variegation changing with maturity to clear ivory-white, a few dots of the same colour being scattered along the margin. Antipodes, 1888.

C. eminens (eminent). *l.* broadly lanceolate, tapering, glossy green, the midrib and part of the lateral veins white. 1883. Habit dense.

C. excurrens (excurrent). *l.* oblong, stalked; midrib excurrent like a small horn near the apex of the leaf, which is variegated with greenish-yellow. 1884.

C. Exquisite. *l.* 6in. to 9in. long, 2in. broad, obovate, acuminate, arching, pale green, marbled and margined primrose and yellow.

C. Eyrei (Eyre's). *l.* long and narrow, twisted, recurved, freely variegated with yellow; petioles and young branches red. 1883.

C. formosum (handsome). *l.* green, spotted yellow, which afterwards changes to crimson; centre and principal veins yellow, becoming, with the margin, a bright magenta-purple; leafstalks crimson.

C. Goednoughtii (Goednought's). *l.* clear green, variegated with yellow. Santa Cruz, 1876.

C. Golden Queen. *l.* 8in. to 10in. long, 3in. broad, ovate, acuminate, deep green, spotted with gold, the centre wholly golden; petioles rose-colour.

C. heroicum (heroic). *l.* green, freely marked deep yellow, the veins, and often the half, or even the whole, leaf-surface, being yellow, occasionally flushed or lined rosy-crimson.

C. Jubilee. *l.* 10in. to 14in. long, 2in. broad, lanceolate, acuminate, with a broad, central stripe, cross veins, and a narrow margin of golden-yellow, which colour changes with maturity to a fiery-crimson. 1887.

C. Junius. *l.* long, narrow, varying in outline, the lower half lemon-yellow, becoming suffused crimson with age, the remaining portion bronzy-green; petioles and stems bright orange-scarlet. 1888.

C. Katharina. *l.* 9in. to 12in. long, 2in. broad, spiral, closely set, splashed and marbled crimson and scarlet. 1887.

C. lineare (linear). *l.* 4in. to 6in. long, linear, usually obtuse, but sometimes narrowed to the point, dark green, with a yellow midrib and a few lateral blotches of the same colour, occasionally almost wholly yellow.

C. Magnificent. *l.* ovate-lanceolate, 6in. to 8in. long, 2½in. broad, when young having a central variegation of golden-yellow; with maturity the margins become deep olive-green, while the midrib and primary veins, with a narrow band on each side the midrib, assume a bright carmine. 1888.

C. Monarch. *l.* oblong, acute, 1ft. long, 2½in. broad, dark green, spotted bright yellow. Antipodes, 1888.

C. Mrs. Swan. *l.* 6in. to 9in. long, 1½in. broad, lanceolate, acuminate, arching, the centre irregularly marked with golden-yellow, the margin of dark green spotted with golden-yellow; petioles and stem crimson.

C. musaicum (mosaic). *l.* oblong lanceolate, acuminate, wavy, crimson, with one or two series of irregular, green blotches on each side of the midrib; in the young leaves the crimson is replaced by a creamy colour, affording a very handsome variegation. 1883. SYN. *Croton musaicus* (R. H. 1882, 240).

C. Nestor. *l.* lanceolate, bright green, variegated with yellow and whitish, the variegation forming a broad, central stripe, the midrib bright magenta-crimson. Polynesia, 1887. A form of *C. medium variegatum.* See Fig. 271.

Codiæum—*continued.*

C. ornatum (adorned). *l.* green, blotched yellow, and with a narrow central band and long parallel veins of creamy-yellow, the yellow parts becoming crimson; occasionally the lines and blotches are rosy-pink, and the midrib is of a deep rosy-crimson

C. Phillipsii (Phillips'). *l.* linear-lanceolate, 8in. to 10in. long, ¾in. broad, the base rich golden-yellow, this colour extending half-way through, and continuing along the centre nearly the whole length. 1886.

C. picturatum (painted). *l.* blotched with red and yellow. New Hebrides, 1876.

C. Prince Henry. *l.* 1ft. to 1¼ft. long, 3in. broad, recurved, the midrib crimson and gold, furrowed, with a narrow margin, occasionally spotted on a dark, bronzy-green ground; markings changing with maturity to a deep blood-red.

C. Princess of Waldeck. *l.* broadly lanceolate, about 4in. long, the central portion of a bright, clear yellow, with a broad and distinct margin of deep green. 1882. A handsome variety.

C. recurvatum (recurved). *l.* recurved, lanceolate, acuminate, marked with yellow along the crimson midrib and lateral veins. 1883.

C. reginæ (Queen's). *l.* olive-green, with orange, yellow, and crimson markings. Polynesia, 1878.

C. ruberrimum (very red). This is one of the narrow, drooping-leaved forms, with the usual crimson and creamy variegation. 1884.

C. rubro-lineatum (red-lined). *l.* spreading, oblong-lanceolate, 1in. to 1½in. long, when first expanded pale yellow and green, many of them tinged rose, but deepening with age to golden-yellow or olive-green, the midrib and nerves, and in many cases the margin also, becoming crimson. 1882. A fine plant.

C. Russelli (Russell's). A seedling form of *C. pictum.* 1893. (J. H. xxvii., p. 493, f. 71, under the name of *Croton Russelli.*)

C. Sceptre. *l.* ribbon-like, dark bottle-green, spotted with fiery orange and yellow; midrib crimson. 1884.

FIG. 271. UPPER PORTION OF BRANCH OF CODIÆUM NESTOR.

C. Sunshine. *l.* 9in. to 10in. long, about 2in. wide, dark bronzy-green, when young blotched with yellow, which gradually changes into rosy-crimson, eventually becoming blood-red. South Sea Islands, 1887.

C. Thomsoni (Thomson's). One of the many seedling forms of *C. pictum.* 1893.

C. torquatum (chain-bearing). *l.* green, with yellow spots that change to red, broken up into chain-like segments. Polynesia, 1878.

C. Torrigianianum (Marchesi Torrigiani's). *l.* plain, about 1in. broad, at first ribbed and veined with yellow, subsequently assuming a high crimson tint along the midrib, margins, and transverse arching veins, the intermediate spaces being green; petioles and stem red. 1884. A handsome plant, in the way of *Queen Victoria.*

C. Van Oosterzeei (Van Oosterzee's). *l.* narrow-linear-lanceolate, acuminate, green, spotted with yellow. 1883. A small but distinct and ornamental shrub. (I. H. 1883, 502.)

C. Victory. *l.* 1ft. long, 2½in. broad, deep olive-green, with crimson veins and midrib, from which latter extends, in an arcuate manner, a coloration of reddish-crimson, the deep green between the primary veins being broken up in an irregular manner by the same bright colour; young ones orange-yellow, suffused crimson. 1888.

Codiæum—*continued.*

C. vittatum (striped). *l.* green, marked with a broad band of creamy-yellow, which runs out laterally along the bases of the distant primary veins; petiole (as well as the midrib in older leaves) bright ruby-red. 1887.

C. Wigmannii (Wigmann's). *l.* 8in. to 10in. long, ¼in. broad, irregular in form, rich green, blotched with yellow. 1886. A good decorative plant for the table.

CODLIN MOTH. *See* **Apple** or **Codlin Grub.**

CODONANTHE (from *kodon*, a bell, and *anthos*, a flower; in allusion to the shape of the corolla). SYNS. *Coccanthera*, *Hypocyrta* (in part). ORD. *Gesneraceæ*. A small genus (five species) of stove, herbaceous plants, found creeping or climbing over rocks and trees in Brazil and Guiana. Flowers whitish, solitary in the axils, shortly pedicellate; calyx free, with five linear segments; corolla tube declinate or decurved, the throat rather broad, the limb oblique, with five spreading lobes. Leaves opposite, entire, often rather small and slightly fleshy. For culture of *C. gracilis*, the only species introduced, *see* **Gesnera.**

C. gracilis (slender). *fl.* creamy-white, spotted with orange on the under-side of the tube within; peduncles short, red, single or in pairs, one-flowered. June. *l.* opposite, thick, fleshy, ovate, dark green above, pale and often blotched with red beneath. Stem branched, terete, purplish-brown, rooting from below the insertion of the leaves. Organ Mountains, 1850. SYN. *Hypocyrta gracilis* (B. M. 4531).

CODONIUM. A synonym of **Schœpfia** (which *see*).

CODONOPHORA. A synonym of **Paliavana** (which *see*).

CODONOPSIS. This genus includes about a dozen species, natives of the Himalayas, Yunan, Mandschuria, and Japan. To those described on p. 356, Vol. I., the following should be added:

C. clematidea is probably only a form of *C. ovata.*

C. lanceolata (lanceolate). *fl.* forming a short, simple raceme; corolla pale lilac outside, violet inside, the segments ovate-deltoid. *l.* on the stems alternate, those on the branchlets approximating, shortly petiolate, oblong-lanceolate, 1in. to 2in. long, entire or remotely crenulate. Stems twining, 2ft. to 3ft. long, purplish. China (cultivated in Japan), 1861. Tuberous-rooted. SYN. *Campanumœa lanceolata* (F. d. S. 927).

C. ovata (ovate). *fl.* pale blue; corolla broadly campanulate, 1in. to 1½in. long; peduncles 3in. to 6in. long, terminal. *l.* ovate, ¼in. to ⅜in. long, alternate and opposite, obtuse or acute, hairy on both surfaces; petioles ¼in. to ⅜in. long. Stems 6in. to 12in. long, decumbent, then erect. Himalayas, 1856. Half-hardy perennial. (G. C. 1856, p. 468.)

CŒLANTHA. A synonym of **Gentiana** (which *see*).

CŒLEBOGYNE. Included under **Alchornea** (which *see*).

CŒLIA. SYN. *Bothriochilus.* Of this genus there are about half-a-dozen species, natives of the West Indies, Central America, and Mexico. To those described on p. 356, Vol. I., the following should be added:

C. bella (beautiful). *fl.* three or four, erect, 2in. long; perianth yellowish-white, with rose-purple tips to the segments, and having an orange mid-lobe to the lip, tubular below, funnel-shaped above; scape 2in. to 4in. long, clothed with brown sheaths. Autumn to December. *l.* several, 6in. to 10in. long, elongate-ensiform, acuminate. Pseudo-bulbs 1½in. to 2in. long, globose or ovoid. Ile St. Catherine, 1832. (B. M. 6628; W. O. A. ii. 51.) SYNS. *Bifrenaria bella* (L. J. F. iii., 325), *Bothriochilus bellus.*

C. Mooreana, a garden form, is also in cultivation.

CŒLIOPSIS. *C. hyacinthosma* thrives under cool-house treatment.

CŒLOGLOSSUM. Included under **Habenaria** (which *see*).

CŒLOGYNE. SYNS. *Acanthoglossum*, *Chelonanthera* (in part). This genus embraces about fifty species, broadly dispersed over the East Indies and the Malayan Archipelago, one extending as far as South China.

The majority of the dwarf-growing section of Cœlogynes are best grown in pots or pans. The taller and more robust-growing varieties, such as *C. Dayana*, *C. Massangeana*, *C. tomentosa*, and the more recently introduced *C. Veitchii*, with its charming pendulous spikes of pure white flowers, are certainly better accommodated in baskets, which may be suspended near the roof-glass. The

Cœlogyne—*continued.*

plants under these conditions are brought nearer the light, which greatly assists them in maturing their growths, and thus induces them to flower more freely. Moreover, when the flowers are expanded, the baskets are more easily removed to positions in which to display their racemes of flower to the best advantage. The usual mixture of peat and sphagnum is the best potting material.

C. pandurata does best when placed on a block or teak raft, arranged horizontally on the stages, or suspended from the roof. A small quantity of fibrous peat and living sphagnum should be packed carefully and firmly around the base of the plant, to retain the desirable moisture at the roots. It requires a hot, humid atmosphere at all seasons of the year.

To those described on pp. 356-8, Vol. I., the following should be added:

C. Balfouriana (Balfour's). *fl.* coloured cinnabar, orange, and white, disposed in long, arched spikes. 1896. Described as a free-flowering and distinct species, but habitat not recorded.

C. birmanica (Birma). *fl.* having a shortly-toothed front border to the lip, and a nearly entire border round the anther; along the crests are several brown spots on a white ground. Birma, 1883. Probably only a trifling variety of *C. præcox.*

C. borneensis (Bornean). *fl.* small; sepals and petals whitish; lip marked with reddish-brown; raceme about 5in. long. *l.* obovate. Pseudo-bulbs ovoid, two-leaved. Borneo, 1893.

C. carinata (keeled). *fl.*, sepals and petals whitish-green, 1in. long; lip spotted with brown, three-lobed; scape 4in. to 8in. long, six-flowered. *l.* oblong-lanceolate, 5in. long. Pseudo-bulbs four-angled, 2in. long, two-leaved. New Guinea, 1895.

C. Clarkii (Clark's). *fl.*, sepals and petals light brown; lip of a yellowish-brown, margined with brown. Habitat not recorded, 1893.

C. concolor (one-coloured). *fl.*, sepals and petals dark rose; lip dark rose, with yellow blotches, in which are several brownish-crimson spots, elegantly fringed, the crest pale yellow. *l.* (and pseudo-bulbs) as in *C. præcox.* India. SYN. *Pleione concolor*

C. coronaria (crowned). A synonym of *Trichosma suavis.*

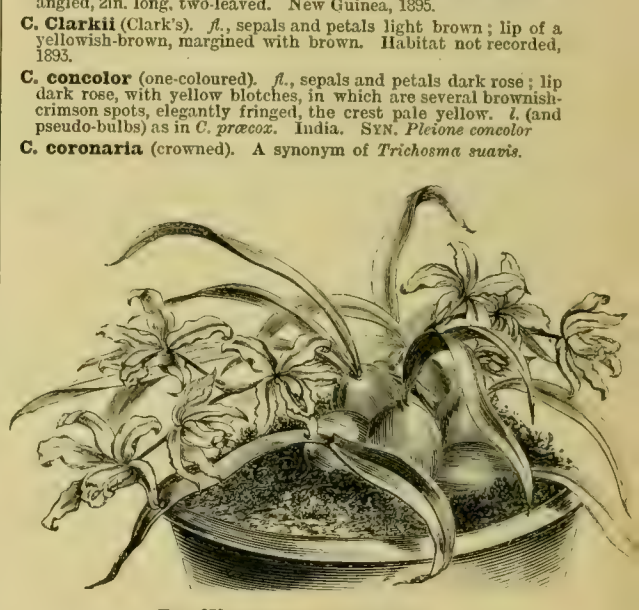

FIG. 272. CŒLOGYNE CRISTATA.

C. cristata. The habit of this beautiful and easily-grown species is shown in Fig. 272.

C. c. alba (white). *fl.* wholly white. Winter and spring. India. (L., t. 173; W. O. A. ii. 54.) SYN. *C. c. hololeuca.* See Fig. 273.

C. c. citrina (citron-colour). *fl.* having the centre of the lip stained delicate lemon-colour. Nepaul. SYN. *C. c. Lemoniana.*

C. c. hololeuca (wholly white). A synonym of *C. c. alba.*

C. c. Lemoniana (Lemon's). A synonym of *C. c. citrina.*

C. c. major (larger). *fl.* larger than in the type, with much broader and stouter sepals and petals. India.

C. c. maxima (greatest). A large-flowered variety, with unusually broad sepals and petals, and shallow side lobes to the lip. 1886.

C. cuprea (coppery). *fl.* somewhat resembling those of *C. speciosa*, but reduced in size, drooping; stalks bearing five to eight bracts. *l.* oblong. Pseudo-bulbs long, Onion-like. 1892.

C. Dayana (Day's). *fl.* light ochreous; sepals and petals ligulate, acute; lip broad, three-lobed, the side lobes striped dark brown, wavy, the middle lobe reniform, crenulate, with a dark brown

Cœlogyne—*continued.*

crescent, two keels running from the base of the lip to the base of the middle lobe, where they divide into six; inflorescence long, lax, many-flowered. *l.* stalked, oblong, acuminate. Pseudo-bulbs long, narrow, fusiform. Borneo, 1884. (G. C. n. s., xxvi., p. 44; W. O. A. vi. 247.)

C. elata (tall).* *fl.* medium-sized; sepals and petals white, narrowish; lip white, with a forked, yellow band in the centre, and two orange-striped crests on the disk; racemes erect, springing with the leaves from the apex of the pseudo-bulbs. *l.* sword-shaped, striated. Pseudo-bulbs tall, oblong, angled. Tongoo, Darjeeling (8000ft. to 9000ft.), 1837. (B. M. 5001.)

C. elegans (elegant). A synonym of *C. Huettneriana.*

C. fimbriata (fringed). *fl.*, sepals yellowish-green or brownish, ovate-lanceolate, ¾in. long; petals filiform; lip yellow, streaked with reddish-brown, the mid-lobe fringed, scape 1in. to 2in. long, one-flowered. October and November. *l.* sessile, 2in. to 5in. long, lanceolate. Pseudo-bulbs ovoid-oblong, ¾in. to 1½in. long. Khasia and China. (B. R. 868.)

C. flavida (yellowish). *fl.* yellow, ½in. across, sub-erect; scape slender, eight- to ten-flowered. Spring. *l.* 3in. to 6in. long, petiolate, narrow-lanceolate, acuminate. Pseudo-bulbs 1in. to 2in. long, distant, on a slender, scaly rhizome. Sikkim Himalaya, &c., 1838.

FIG. 273. CŒLOGYNE CRISTATA ALBA.

C. flexuosa (flexuous). *fl.* white, with a slight yellow stain across the middle of the lip, extended as a narrow line on either side of the disk to near the base, at which point the lip is very sharply constricted, producing a narrow, transverse channel underneath. Java, 1892.

C. Foërstermanni (Foërstermann's.) *fl.* white, with some yellowish-brown on the disk of the lip; sepals and petals ligulate, acute; lip trifid, the lateral laciniæ rounded, the middle one rounded and apiculate; peduncles sometimes forty-flowered. *l.* cartilaginous, ribbed, 1½ft. long, 3in. or more wide, on very short petioles. Sunda Islands, 1887.

C. fuliginosa (sooty). *fl.* expanding one at a time, 2in. across; sepals and petals brownish-white, with a rosy tinge; lip similarly coloured, the mid-lobe deep reddish-brown; racemes shorter than the leaves, two- or three-flowered. *l.* broadly lanceolate, 5in. to 7in. long. Pseudo-bulbs 2in. to 3in. long. Northern India, 1838. (B. M. 4440; L. J. F., t. 7.)

C. glandulosa (glandular). *fl.* pure white, 1¼in. in diameter, disposed in a nodding raceme; front lobe of the lip ovate, marked on the disk with yellow lines. *l.* oblong-lanceolate. Pseudo-bulbs ovate, sulcate. Nilghiri Mountains, 1882.

C. graminifolia (Grass-leaved).* *fl.* nearly 2in. across the petals; sepals white, narrowly oblong-lanceolate, acute; petals similar, but rather narrower; lip three-lobed, the lateral lobes white, streaked purple, oblong, the middle one orange-yellow, with three purple ridges; raceme two- to four-flowered; scape 1in. to 2in. long. January. *l.* two, Grass-like, 1ft. to 1½ft. long. Pseudo-bulbs 1in. to 1½in. long. Moulmein, 1883. (B. M. 7006.)

C. Hookeriana brachyglossa (short-lipped). *fl.*, lip white, with light sulphur on the disk, and with several reddish-brown spots, open, not at all abruptly convolute, yet the upright sides of the lip show lobes. 1887.

Cœlogyne—*continued.*

C. Huettneriana (Huettner's). *fl.* white, eight to ten in a raceme; lip toothed, with a rounded-ovate mid-lobe; bracts 1in. long, cymbiform; scape 7in. long. *l.* petiolate, oblong-lanceolate. Pseudo-bulbs fusiform, much wrinkled. Tenasserim. SYN. *C. elegans.*

C. humilis albata (white-clothed). In this variety the sepals and petals are snowy-white, and the lip is white, with light mauve-purple, radiating lines of small, confluent spots, and with an orange spot on each side of the anterior part.

C. javanica (Javanese). *fl.* yellowish-green, with a white lip and column; lip fringed and bearded; column petaloid; scape one-flowered, with leafless membranous sheaths often piercing the dead leaves. Pseudo-bulbs spherical. *h.* 2in. to 4in. Java.

C. lactea (milky). *fl.*, sepals and petals creamy-white, faintly tinged yellow; side laciniæ of lip light ochre, veined brown, mid-laciniæ bright yellow at base. *l.* 7in. to 8in. long, very thick, cuneate-oblong, acute, petiolate. Pseudo-bulbs light green, plump, short, wrinkled. Birma, 1883.

C. lamellata (lamellate). *fl.*, whitish-green; sepals and petals oblong-lanceolate, keeled, 1¼in. long; lip three-lobed, corrugated; scape erect, three-flowered. New Hebrides, 1895.

C. lentiginosa (freckled). *fl.* 1¼in. in diameter; sepals and petals pale green or straw-coloured; side-lobes of lip margined with brown, the large mid-lobe white with orange blotches; broadly clawed; raceme (including the scape) 4in. to 5in. long, sheathed up to the flowers, which number five to eight. *l.* linear-oblong, 6in. to 8in. long. Pseudo-bulbs 3in. to 4in. long, obtusely four-angled. Tenasserim, 1847. (B. M. 5958.)

C. Lowii (Low's). A synonym of *C. asperata.*

C. lurida (lurid). *fl.*, sepals and petals greenish-yellow, tinged with purple; lip white and purplish, three-lobed. Origin not recorded. 1896. (L. 1896, t. 532.)

C. maculata alba (white). A variety having white flowers. 1893.

C. m. Arthuriana (Arthur Veitch's). *fl.* smaller than in the type, having purple lines on the petals, and a continuous purple band around the front margin of the lip. 1881.

C. m. virginea (virgin-white). *fl.*, lip tinted with light sulphur, the nearly evanescent, purple lines in the middle very few. 1887.

FIG. 274. CŒLOGYNE MASSANGEANA.

C. Massangeana. A flower of this fine Malayan species is shown in Fig. 274.

C. Mayeriana (Mayer's). *fl.* having green sepals and petals, and a green and black lip, resembling those of *C pandurata.* Tropical Asia, 1894.

C. Micholitzii (Micholitz's). A provisional name for what is described as a new introduction from "the East." In habit it resembles *C. barbata*, and is said to have "scapes 2ft. high, bearing large, pure white flowers." 1895.

C. Mossiæ (Mrs. Moss's). *fl.* pure white, 1¼in. across, with a yellow, crescent-shaped mark on the lip; raceme 6in. long, about six-flowered. *l.* 6in. long. Pseudo-bulbs 1¼in. long, ovate, two-leaved. Nilghiri Mountains, 1894. Allied to *C. nervosa.* (G. C. 1894, xv., p. 400, f. 49.)

C. nervosa (nerved). *fl.*, sepals and petals white, acute, the former 1in. to 1¼in. long; lip white and yellowish-brown; bracts very large; scape erect, sheathed up to the few flowers. *l.* oblong-lanceolate, 4in. to 6in. long. Pseudo-bulbs, 2in. to 3in. long, ovoid, curved. Nilghiri Mountains.

C. ochracea (ochreous). *fl.* white, very fragrant, produced in erect racemes of about seven or eight; lip having two horseshoe-shaped blotches on the disk, which are bright ochreous-yellow, bordered orange. *l.* two or three, lanceolate. Pseudo-bulbs small, oblong. North-east India, 1844. (B. M. 4661; B. R. 1846, 69; L. J. F. 342.)

Cœlogyne—*continued.*

C. peltastes (half-moon-like). *fl.* resembling those of *C. pandurata*, except in the lip, which is creamy-white with yellowish-brown markings. Pseudo-bulbs crescent-shaped, rather wide and flat, concave, forming receptacles for water. Borneo, 1880. (L. vi., t. 258.)

C. præcox (early). The correct name of the plant described on p. 358, Vol. I., as *C. Wallichiana.*

C. p. tenera (slender). *fl.* pale lilac and yellow, having a few purple-mauve blotches on the lip. 1883.

C. prolifera (proliferous). *fl.* greenish-yellow, small; scape long, slender, many-flowered. *l.* 3in. to 7in. long, petiolate, lanceolate. Pseudo-bulbs 1½in. to 2½in. long, distant, ovoid or oblong, compressed. Tropical Himalayas, 1837.

C. pulchella (rather pretty). *fl.* pure white, with the exception of a brown blotch on the disk of the lip and a smaller one at the base; scapes terminal, slender, bearing several flowers. *l.* rather thick, oblong-lanceolate. Pseudo-bulbs ovoid-oblong, two-leaved. 1898.

C. purpurascens (purplish). *fl.* nearly white, small; scape 3in. to 4in. long, one- to three-flowered. *l.* 1in. to 4in. long, ½in. to ½in. broad, coriaceous, often purplish. Pseudo-bulbs very slender, one-leaved. Ceylon.

C. rigida (rigid). *fl.* yellow, with three red ridges on the disk of the lip; sepals ½in. long; scape (with the drooping raceme) 6in. to 8in. long, rigid. *l.* petiolate, elliptic-lanceolate, 4in. to 6in. long. Pseudo-bulbs 3in. to 5in. long, narrow-oblong. Tenasserim, 1837

C. Rochusseni (Rochussen's). *fl.* pedicellate, pendulous; sepals keeled, acuminate; petals smaller; raceme very long, flexuous. *l.* elliptic, lanceolate, or oblong-lanceolate. Pseudo-bulbs ovate or oblong, angled, two-leaved. Java.

C. Rossiana (Ross's). *fl.*, sepals and petals creamy-white, ligulate, acute; lip mostly ochre, the disk, broad claw, and top of the mid-lacinia white; column white, with a brown mid-line in front; bracts linear, acuminate. *l.* two, long-petiolate, cuneate-oblong-lanceolate, acute, more than 1ft. long and 1½in. broad. Pseudo-bulbs 2in. to 3in. long, nearly obpyriform. Birma, 1884. (B. M. 7172.)

C. Rumphii (Rumphius'). *fl.* disposed in a spike 6in. long; sepals and petals apple-green, the former lanceolate, the latter linear; lip pandurate, the side lobes spotted with red, the middle one pure white. *l.* 1ft. long, obovate. Pseudo-bulbs oblong. Amboyna, re-introduced 1896.

C. salmonicolor (salmon-coloured). *fl.* salmon-coloured, solitary, the three-lobed lip being somewhat tessellated with brown. *l.* solitary, cuneate-oblong, acuminate, undulated, green at base, coppery elsewhere. Pseudo-bulbs tetragonal, pear-shaped. Java or Sumatra, 1883. Allied to *C. speciosa*, but smaller.

C. Sanderæ (Mrs. Sander's). *fl.* white, 2in. across, with a yellow blotch on the lip and a fringe of long, brown hairs on the three parallel keels; scapes erect. *l.* ovate-lanceolate. Pseudo-bulbs ovate, tapering, 3in. to 4in. long. Upper Birma, 1893. Allied to *C. barbata.* (G. C. 1893, xiii., pp. 336, 360, f. 52; J. H. 1893, xxvi., p. 313, f. 59; R. t. 56.)

C. Sanderiana (Sander's).* *fl.* snow-white, large and showy; sepals ligulate, acute; petals lanceolate, acute, dilated above; side laciniæ of the lip marked with three brown stripes, the anterior lacinia yellow, with a few white marks, and having yellow crests; peduncles sometimes nine-flowered. *l.* petiolate, cuneate-oblong, acute, chartaceous. Pseudo-bulbs fusiform-cylindrical, two-leaved. Sunda Isles, 1887.

C. sparsa (sparse). *fl.* white; lip three-lobed, having a brown spot in front of the keels, some smaller ones on the side lobes, and a yellow one at the base; peduncle one- to four-flowered. *l.* cuneate-oblong, acute, glaucous, 3in. to 4in. long, 1in. broad. Pseudo-bulbs glaucous, fusiform. Philippines, 1883. A charming, dwarf plant.

C. stellaris (star-like). *fl.*, sepals and petals green; lip white, marked with brown lines on the side lobes. Pseudo-bulbs tetragonal. Borneo, 1886.

C. Swaniana (J. M. Swan's). *fl.* 2in. across; sepals white, 1in. long; petals white, narrower; lip pale brown, darker round the margins and tips of the lobes; column yellow; raceme 1ft. long, many-flowered. May and June. *l.* two, 6in. to 8in. long, elliptic-lanceolate; petioles 2in. to 3in. long. Pseudo-bulbs 3½in. to 4in. long, obtusely four- to six-angled. Philippine Islands, 1892. (B. M. 7602; R., ser. ii., t. 92.)

C. tenuis (slender). *fl.* of a light buff tint, small. Borneo, 1893. This species is allied to *C. borneënsis*, but differs in having slender scapes, one-leaved pseudo-bulbs, &c.

C. testacea (brick-coloured). *fl.* 1½in. across; sepals and petals pale brown; side lobes of lip dark brown, margined with white, narrow, the mid-lobe broad; column white; raceme many-flowered, pendulous. *l.* 6in. to 8in. long, lanceolate, petiolate. Pseudo-bulbs 3in. to 5in. long, narrow-ovoid. Singapore, 1842.

C. thuniana (Thunia-like). A synonym of *C. uniflora.*

C. tomentosa (downy). *fl.* 2in. to 2½in. in diameter; sepals and petals light orange-red; lip white, streaked with red on the inner side, obovate in outline, the mid-lobe three-keeled; racemes pendulous, the rachis and pedicels roughly tomentose. *l.* 9in. to 12in. long, variable. Pseudo-bulbs elongated-ovoid, 2in. to 3in. long. Borneo, 1873.

C. uniflora (one-flowered). *fl.* white or flesh-coloured; sepals 1in. long; lip having three to seven orange spots; scape ½in. to 1in. long, one- or two-flowered. *l.* 3in. to 6in. long, erect, narrow-lanceolate. Pseudo-bulbs 1in. to 2in. long, ovoid, crowded. India. (R. X. O. i., t. 46.) SYN. *C. thuniana.*

C. Veitchii (Veitch's). *fl.* pure white, about 1in. in diameter; racemes drooping, 2ft. long, many-flowered. *l.* lanceolate, 6in. long. Pseudo-bulbs fusiform, 4in. long. New Guinea, 1895.

C. ventricosa (big-bellied). A synonym of *Pholidota ventricosa.*

C. virginalis (virgin-white). A provisional name for an imported plant described as having pure white flowers in the way of *C. cristata*, and deliciously fragrant. Habitat not recorded, 1896.

The following are also in cultivation at Kew: *C. asperata sumatrana*, *C. conferta*, and *C. Lauterbachiana.*

CŒLOSTYLIS. A synonym of **Spigelia** (which *see*).

COETANEOUS. Contemporary; of the same age.

COFFEA. About a score species, natives of tropical Asia and Africa and the Mascarene Islands, form this genus. Flowers white. Fruit globose or oblong, dry or fleshy, two-stoned. To the species described on p. 358, Vol. I., the following should be added:

C. arabica (Arabian). This is partly synonymous with *C. liberica*, and partly with *C. stenophylla.*

C. stenophylla (narrow-leaved). *fl.* ⅓in. long, one to three together, sub-sessile, in axillary clusters. *fr.* ½in. long, black when ripe. *l.* elliptic-oblong or obovate, caudate-acuminate, 1½in. to 5½in. long; petioles very short. Stem about 10ft. high, 13in. in diameter near the base. Upper Guinea, 1896. "One of the two indigenous West African species, which, in point of commercial value, may prove a formidable rival to the Arabian." (B. M. 7475.)

COHORT. In botany, this term is used for a group of natural orders within a class. *See* **Class.**

COIX. SYN. *Lithagrostis.* Three or four species are included in this genus. Spikelets unisexual, monœcious, spicate, the upper ones mostly males, the females one or two at the base of the spike; glumes four.

COKE. An excellent fuel for nearly all kinds of hot-water boilers, and in the neighbourhood of gasworks may be cheaply purchased. Probably it is next to Anthracite for heating, economy, and cleanliness, being practically smokeless, and requiring little attention.

COLA. Kola Nut-tree. SYNS. *Lunanea*, *Siphoniopsis.* Half-a-dozen tropical African species compose this genus. Flowers fascicled in the axils, shortly cymose, or sub-paniculate; calyx usually five-cleft; petals wanting. Leaves entire or lobed.

COLAX HARRISONIÆ. A synonym of **Bifrenaria Harrisoniæ** (which *see*).

COLCHICUM. About thirty species, natives of Europe, West and Central Asia, and North Africa, are here included. To those described on p. 359, Vol. I., the following should be added:

C. agrippinum (Wild Olive-like). *fl.*, two to four to a spathe; perianth tube whitish, 2in. to 4in. long, the limb of a beautiful lilac-purple tessellated with white, 1½in. to 2½in. long. Autumn. *l.* three or four, vernal, sub-erect, lanceolate, 6in. to 9in. long. Corm ovoid, 1in. to 1½in. thick. Origin unknown. An old favourite in English gardens. SYN. *C. tessellatum.*

C. alpinum parvulum (rather small). *fl.* pale lilac, smaller, and leaves narrower than in the type. Italy, &c., 1834.

C. Bornmülleri (Bornmüller's). This closely resembles *C. speciosum*, of which it is perhaps merely a geographical form. May. Orient, 1892.

C. byzantinum cilicicum (Cilician). *fl.* as large as those of *C. speciosum.* Asia Minor, 1896. A handsome variety.

C. candidum (white). A synonym of *C. lætum.*

C. caucasicum (Caucasian). A synonym of *Merendera caucasica.*

C. cilicicum (Cilician). A form of *C. byzantinum.*

C. crociflorum (Crocus-flowered) (B. M. 2673.) A synonym of *C. autumnale.*

C. Decaisnei (Decaisne's). *fl.* pale rosy-purple, large; perianth tube much longer than the elongated, elliptic segments (which are 1½in. to 2in. long); stamens rather shorter than the perianth.

Colchicum—*continued.*

l. 6in. to 8in. long, 1in. to 1½in. broad, lanceolate, attenuated above. Orient, 1892.

C. fasciculare (fascicled). *fl.* white, numerous, fascicled; perianth tube two-and-a-half times longer than the limb, the segments nearly 1½in. long, narrow-elliptic-lanceolate. February. *l.* five to seven, lanceolate, 6in. long, six to ten lines broad. Syria, &c., 1896. According to J. G. Baker, this is merely a form of *C. montanum.*

C. lætum (pleasing). *fl.* often pale lilac (or white, flushed with pale rose), many to a spathe; perianth tube 2in. to 6in. long, the limb 2in. to 2½in. long, the segments ½in. to ¾in. broad. Autumn. *l.* four to six, lingulate, sub-erect, sometimes 1ft. long and 1in. to 2in. broad. Leafy stem at length 5in. to 6in. long. Corm 1½in. to 2in. thick. Tauria, 1897. SYN. *C. candidum.*

C. latifolium (broad-leaved). A synonym of *C. Sibthorpii.*

C. montanum (of Linnæus). A synonym of *Merendera Bulbocodium.*

C. montanum Ritchii (Ritch's). *fl.* pink or rarely white; filaments crested at base. Asia Minor, 1897.

C. Parkinsoni is a form of *C. variegatum.*

C. parvulum (rather small). A form of *C. alpinum.*

C. procurrens (running). *fl.* one to a spathe; perianth tube pale, 4in. long, the segments bright lilac, 1in. long. Autumn. *l.* appearing in spring, three to a sheath, linear, ½in. broad, dull glaucous-green. Smyrna. SYN. *Merendera sobolifera* (of gardens).

C. Ritchii (Ritch's). A form of *C. montanum.*

C. Sibthorpii (Sibthorp's). *fl.* three or four in a spathe, tessellated with lilac-purple; perianth tube often 6in. long, the limb 1½in. to 2in. long. Autumn. *l.* four or five, broadly strap-shaped, appearing in spring. Corm 1½in. to 2in. thick. Greece and Armenia, 1890. SYN. *C. latifolium.*

C. tessellatum (tessellated). A synonym of *C. agrippinum.*

C. Troodii (Trood's). *fl.* numerous; perianth white, 1½in. in diameter, the segments narrow-oblong. Autumn. *l.* appearing in spring, 6in. to 12in. long, ⅜in. to 1in. broad, strap-shaped, obtuse, dark green. Corm depressed-globose. Cyprus, 1886. (B. M. 6901.)

COLEA. Nine or ten species, natives of the Mascarene Islands, are included in this genus. To those described on p. 360, Vol. I., the following should be added:

C. mauritiana (Mauritian). *fl.* dark rose, shortly pedicellate, fascicled on the stems; corolla glabrous. *l.* oblong, warted. *l.*, leaflets in whorls of three, almost sessile, elliptic-lanceolate, acuminate. Mauritius.

COLEBROOKIA. Sir J. D. Hooker regards this as a monotypic genus, *C. ternifolia* not being specifically distinct from *C. oppositifolia.*

COLENSOA (named in honour of the Rev. W. Colenso, who assisted Hooker in the investigation of the botany of New Zealand). ORD. *Campanulaceæ.* A monotypic genus. The species is a glabrous, erect herb, suffrutescent at base. It will thrive in sandy loam, and would probably succeed in the open air, in a warm, sheltered place. Propagated by seeds or by cuttings.

C. physaloides (Physalis-like). *fl.* very pale bluish, 1½in. long, bilabiate, the upper lip divided into two linear lobes; stamens free of the corolla tube, the filaments scarcely connate; racemes short, terminal, leafless, few-flowered. Summer. *fr.* a violet, globose berry, crowned by the linear, green calyx teeth. *l.* alternate, petiolate, elliptic-ovate, acute, doubly serrated, 4in. to 6in. long. *h.* 2ft. to 3ft. New Zealand, 1886. (B. M. 6864.)

COLEOPHORA HEMEROBIELLA. *See* **Pear Insects.**

COLEOPHYLLUM. A synonym of **Chlidanthus** (which *see*).

COLEOSPADIX (from *koleos*, a sheath, and *spadix*; in allusion to the inflorescence). ORD. *Palmæ.* A monotypic genus. The species, *C. oninensis*, is in the Kew Collection, but is not in general cultivation.

COLEOSPORIUM. Included under **Peridermium** (which *see*).

COLEUS. About fifty species are included in this genus, natives of tropical Asia, Africa, and (one) Australia. It differs from *Plectanthus* only in the filaments being combined below into a sheath around the style. To the

Coleus—*continued.*

species and varieties described on p. 361, Vol. I., the following (all perennials) should be added:

C. Gibsonii (Gibson's). An ornamental plant, having the leaves blotched and veined with purplish-crimson. Native country uncertain, 1866. (F. M., t. 338.)

C. Penzigii (Penzig's). *fl.*, lower lip bright violet, ¼in. long, the upper one smaller, reflexed; whorls simple, eight-flowered, forming a lax raceme 6in. to 8in. long. Autumn. *l.* ovate, 2in. to 3in. long, crenate, pubescent, narrowed suddenly to a winged petiole. Stems clothed with spreading hairs. Mountains of Abyssinia (?), 1893. Perennial.

C. spicatus (spiked). *fl.* ¼in. long; whorls in a dense, cylindric, spike-like, villous thyrse, 8in. long. *l.* sub-sessile, obovate, ovate, or orbicular, 3¼in. long, glabrous, fleshy, entire or crenate. Stem very stout, villous or glabrate, 6in. to 12in. high, simple or branched. South Deccan. Perhaps the typical species is not in cultivation.

C. s. Rondinella (Rondinella). *fl.* blue, disposed in racemes. *l.* fleshy. *h.* 8in. Abyssinia, 1896. A bushy herbaceous plant. (R. G. 1896, p. 358, f. 62.)

C. thyrsoideus (thyrsoid). *fl.* blue, shortly pedicellate; corolla about ¼in. long, the mouth bilabiate; raceme about 3in. broad, the branchlets sub-erect or spreading. February. *l.*, lower ones 7in. long, ovate-cordate, acuminate, coarsely lobulate and crenate; petioles 2in. or more in length; upper leaves smaller, with more deeply-cleft margins. Stem, petioles, and inflorescence pubescent. *h.* 2ft. to 3ft. British Central Africa, 1897. (B. M. 7672.)

COLIC ROOT. *See* **Aletris farinosa.**

COLLABIUM (from *collum*, a neck, and *labium*, a lip; in allusion to the basal part of the lip encircling the column). ORD. *Orchideæ.* A small genus (two species) of stove, terrestrial Orchids, natives of India, Java, and Borneo. Flowers in a long raceme on a tall scape; lateral sepals adnate to the trumpet-shaped foot of the long, incurved column, to which the short lip is also jointed; pollinia two. Leaf plicate. *C. simplex* is the better known species. *C. nebulosum* is in the Kew Collection. For culture *see* **Catasetum.**

C. simplex (undivided). *fl.*, sepals and petals greenish-yellow, with purple and brown blotches; lip white; column white, purple at base; peduncle tumid at base, racemose at apex. *l.* oblong, acute, wavy, green, with darker blotches. Borneo, 1881.

COLLADONIA (of Sprengel). A synonym of **Palicourea** (which *see*).

COLLÆA. Included under **Galactia** (which *see*).

COLLANIA (of Herbert). Included under **Bomarea** (which *see*).

COLLANIA (of Schultes). A synonym of **Urceolina** (which *see*), the correct name of *C. urceolata* being *U. pendula.*

COLLAR. The line of junction between a stem and a root.

COLLATERAL. Side by side.

COLLEMBOLA, or SPRINGTAILS. These are minute insects belonging to the *Aptera*, and are often found in damp spots in the garden. Two out of the three families into which the Sub-Order *Collembola* is divided are capable of leaping; but the remaining one, *Lipuridæ*, does not possess the power of doing so. Like *Aptera* generally, these insects feed upon both animal and vegetable refuse; they cannot be regarded as destructive. Species of *Lipuridæ* are sometimes found in Mushroom-houses, and may be found working up in minute heaps between the bricks, when these are employed.

COLLETOTRICHUM LINDEMUTHIANUM. *See* **Bean Anthracnose.**

COLLYRIS. A synonym of **Dischidia** (which *see*).

COLOCASIA. The five species of this genus are indigenous to tropical America, one being cultivated in all warm regions. To those described on pp. 362-3, Vol. I., the following should be added:

C. Devansayana (Devansaye's). *l.* ample, erect, peltate, ovate, acute, cordate-sagittate at base, highly glabrous, green, the sinus large, triangular; primary veins three or four on both sides, produced on the lower surface, brown; petioles elongated, terete, sheathing at base, coppery-brown. Caudex short and thick. New Guinea, 1886. (I. H. 1886, 601.)

C. esculenta and **C. nymphæifolia** are varieties of *C. antiquorum.*

C. odorata. The correct name is *Alocasia odora.*

COLOCYNTH. *See* **Citrullus Colocynthis.**

COLOPHONIA. A synonym of **Canarium** (which *see*).

COLORADO BEETLE. *See* **Potato Beetle,** Vol. III.

COLPOON-TREE. *See* **Elæodendron.**

COLQUHOUNIA. Three or four species, all natives of India, compose this genus. To the information given on p. 363, Vol. I., the following should be added:

C. tomentosa (R. H. 1873, p. 131) is synonymous with *C. coccinea.*

C. vestita (clothed). According to Sir J. D. Hooker, this is merely a woolly variety of *C. coccinea.*

COLUMBINE, FEATHERED or **TUFTED.** *See* **Thalictrum aquilegifolium.**

COLURIA. *Laxmannia* (of Fischer) is identical with this monotypic genus.

COLUTEA. Eight or ten species have been described, but probably not more than half of them are distinct as such; they are found in Central and Southern Europe and in temperate and sub-tropical Asia. To those described on p. 364, Vol. I., the following should be added. *See also* **Sutherlandia** and **Swainsona.**

C. arborescens melanocalyx (dark-calyxed). A variety having the calyx and pedicles clothed with dark hairs. Asia Minor, 1892.

C. frutescens (shrubby). A synonym of *Sutherlandia frutescens.*

C. longialata (long-winged). This species, which is probably a native of Asia Minor or the Balkan Peninsula, is closely related to *C. arborescens.* 1896.

COLVILLEA (named in honour of Sir Charles Colville, Governor of the Mauritius). ORD. *Leguminosæ.* A monotypic genus. This species is a stove, unarmed tree, thriving in any fairly good compost. Propagation is effected by cuttings, inserted in sand, under a bell-glass, in heat; or by seeds when these are to be had.

C. racemosa (racemose). *fl.* bright scarlet, showy, much crowded; racemes axillary and terminal, 1½ft. long, simple or branched. April and May. *l.* alternate, remote, spreading, oblong-ovate, 3ft. long, bipinnate, the lower ones reflexed; pinnæ twenty to thirty pairs, opposite, 4in. long, with twenty to twenty-eight pairs of linear leaflets ½in. long. *h.* 40ft. to 50ft. Mauritius. (B. M. 3325-6.)

COMANTHOSPHACE. ORD. *Labiatæ.* A genus embracing four species of greenhouse or hardy undershrubs, natives of Japan. *C. japonica* (B. M. 7463), a small plant with hoary branches and inflorescence, is grown at Kew, but is of no particular horticultural value.

COMAROUNA ODORATA. A synonym of **Dipteryx odorata** (which *see*).

COMARUM. This genus is included by Bentham and Hooker under **Potentilla** (which *see*), the correct name of *C. palustre* being *P. Comarum.*

COMATOGLOSSUM. A synonym of **Talisia** (which *see*).

COMB FERN. *See* **Schizæa.**

COMBRETUM. *Poivrea* should be included here, according to Bentham and Hooker. The genus embraces about 120 species, common in tropical America, Africa, and Asia, and in South Africa, but not in Australia or Polynesia.

C. coccineum (scarlet). The correct name of *Poivrea coccinea.*

C. comosum (crowded). *fl.* of a beautiful intense scarlet, crowded on the elongated spikes, which form a compound panicle; bracts lanceolate. May to August. *l.* opposite, oblong, acute, entire, glabrous when adult, sub-cordate at base, shortly petiolate. Branchlets pubescent. *h.* 20ft. Sierra Leone, 1822. (B. R. 1165.) SYN. *Poivrea intermedia.*

C. nanum (dwarf). *fl.* white; petals narrow-obovate, far exceeding the sepals; raceme often sub-terminal and solitary, 6in. to 7in. long; peduncle 1in. to 2in. long. *l.* opposite or alternate, typically 4in. by 3½in., but often smaller and narrower, varying from round-obovate to lanceolate, glabrous. Branches 6in. to 18in. long. India, 1825. Plant decumbent.

COMMELINA. SYNS. *Ananthopus, Erxlebia, Hedwigia.* About ninety species of this genus have been described; they are all tropical or sub-tropical. Flowers blue, yellowish, or rarely white, rather small, in usually bifid cymes, emerging one at a time from a terminal, complicate or funnel-shaped or cucullate spathe, those of the upper branch of the cyme small, deciduous, those of the lower fertile; sepals three, membranous, the two inner often connate at base; petals longer, one larger and often clawed; stamens three perfect and two or three imperfect. Leaves ovate, lanceolate, or linear. To the species described on p. 365, Vol. I., the following should be added:

C. nudiflora (naked-flowered). *fl.* of a showy cobalt-blue. Argentina, 1897. A compact-growing species. SYN. *C. Sellowiana.*

C. pallida (pale). *fl.* blue; spathes oblong, acuminate, folded in two, pubescent. *l.* almost petiolate, oblong, acute, pubescent on both sides; sheaths violaceous, ciliated. Stem erect, branched, pubescent. Mexico. SYN. *C. rubens.*

C. rubens (reddish). A synonym of *C. pallida.*

C. Sellowiana (Sellow's). A synonym of *C. nudiflora.*

C. tuberosa (tuberous). *fl.* sky-blue; spathes ovate-cordate, long-acuminate, corduplicate, ciliated. June and July. *l.* oblong-lanceolate, acute; sheaths pubescent and ciliated. Roots tuberous. Mexico, 1732. Half-hardy perennial.

COMMERSONIA (named in honour of Philibert Commerson, who died in 1727). ORD. *Sterculiaceæ.* A genus embracing about eight species of stove trees or shrubs, natives of tropical Asia and Australia, and closely allied to *Rulingia. C. platyphylla* (B. M. 1813) has been introduced, but is probably not now cultivated.

COMMIA. A synonym of **Excœcaria** (which *see*).

COMMIANTHUS. A synonym of **Retiniphyllum** (which *see*).

COMMIPHORA. A synonym of **Balsamodendron** (which *see*).

COMMON SWIFT MOTH (*Hepialus lupulinus*). Few insects are better known, at least by sight, than the commoner species of this genus, by reason of the peculiar oscillating, hovering flight which characterises the males. The majority of gardeners and farmers, however, do not appear to be aware of the destructive propensities at least of the insect here described. It is the commonest of the five species found in this country, and is quite as destructive as its near relative, the Ghost Moth (*H. Humuli*). As with that insect, the caterpillars of the Common Swift principally attack grass in meadows, lawns, and cricket-grounds, though they frequently forsake such food for Lettuce, Mint, Parsley, Cauliflowers, Brussels Sprouts, and other winter vegetables, as well as Strawberries.

The Moths are on the wing from the end of May until well into June. There is nothing conspicuous about their colouring, and though they are of fairly large size (1¾in. to 1¾in. in wing expanse), they would readily escape observation were it not for the irregular flight of the males at twilight when in search of their mates. The females are less frequently seen, preferring to lie hidden amongst the food-plants, where by an odour they exhale they attract the males. Pairing having taken place, the eggs are laid, and this act is accomplished while the insects are on the wing and flying steadily along. These Moths are somewhat variable as to colour, though usually brown or reddish-brown, with a whitish stripe from the tip to the inner margin, and another running from the base, while above the stripe is an elongated spot.

The caterpillars are slender, yellowish-white, and about 1in. long, and may be found from July at the roots of their food-plants, which quickly show signs of being preyed upon. They are very sensitive to the touch. The larvæ have sixteen feet—six claw-feet, eight sucker-feet, and a pair situate at the hinder extremity of the body. They feed from July or August until spring, though they are somewhat susceptible to frosts. When full-fed they approach the surface of the soil, and become pupæ in loosely-constructed silken cocoons. In this condition they are very restless, and may be observed wriggling about in their cocoons. They are yellowish-brown.

To deal with these pests is somewhat difficult, feeding, as they do, beneath the roots. In the case of grass, however,

1. Helle[illegible] [illegible]. 2. H. [illegible]. 3. H. viridi[illegible].

Common Swift Moth—*continued.*

applications of lime and soot (one part of the former to two parts of the latter) in spring would be of service. In gardens wood-ashes and soot scattered freely round the infested plants, and then hoed in, would render the ground undesirable. Insectivorous birds, again, would destroy large numbers if the soil round the plants could be hoed in spring as the larvæ were about to change into pupæ. *See also* **Otter Moth**, Vol. II.

COMMON YELLOW UNDERWING. *See* **Tryphæna.**

COMOSE. Growing in tufts; bearing a tuft.

COMPARETTIA. This genus embraces six species, natives of the Andes of South America. Sepals erecto-patent, the dorsal one free, the lateral ones connate, produced at base into a long, slender spur which is free of the petals; lip continuous with the base of the column, produced at base into two long, linear spurs, the lateral lobes rather broad, erect, the middle one spreading, very broad. To the species described on p. 366, Vol. I., the following should be added:

C. rosea is a form of *C. falcata.*

C. speciosa (showy).* *fl.* large and numerous; sepals and petals light orange, with a cinnabar glow; lip cinnabar, orange at base, the front lobe sub-quadrate and emarginate, about 1¼in. wide, with a very short claw and a small keel between the basal auricles; spur minutely pilose, upwards of 1½in. long; racemes loose. Ecuador. A beautiful species. (W. O. A. v., t. 233.)

COMPASS PLANT. *See* **Silphium laciniatum.**

COMPLANATE. Flattened vertically to a level surface above and below.

COMPLETE. Furnished with calyx, corolla, stamens, and pistils.

COMPSANTHUS. A synonym of **Tricyrtis** (which *see*).

COMPSOA. A synonym of **Tricyrtis** (which *see*).

COMPTONIA. Bentham and Hooker include this genus under **Myrica** (which *see*), the correct name being *M. asplenifolia.*

CONANTHERA. SYN. *Cumingia.* Three or four species, all Chilian, are included in this genus.

CONCHIUM. A synonym of **Hakea** (which *see*).

CONCHOCHILUS. A synonym of **Appendicula** (which *see*).

CONCHOPHYLLUM. A synonym of **Dischidia** (which *see*).

CONDALIA (named in honour of Condal, a Spanish botanist). ORD. *Rhamneæ.* A genus embracing half-a-dozen species of greenhouse or hardy, deciduous, rigid, spiny, American shrubs, with small, axillary flowers, and alternate, sub-sessile leaves. *C. microphylla* has been introduced, but is of no particular horticultural value.

CONDALIA (of Ruiz and Pavon). A synonym of **Coccocypselum** (which *see*).

CONDAMINEA (named in honour of De la Condamin, a celebrated traveller). ORD. *Rubiaceæ.* A small genus (two or three species) of stove shrubs or small trees, natives of Bolivia, Peru, and Colombia. Flowers rather large, in trichotomously corymbose cymes. Leaves large, shortly petiolate; stipules large, bipartite. *C. tinctoria* has been introduced, but is probably not now in cultivation.

CONE. *See also* **Strobile.**

CONGENERS. Plants of the same genus.

CONGESTED. Packed or arranged very closely together.

CONGLOMERATE. Clustered.

CONIANDRA. A synonym of **Kedrostis** (which *see*).

CONIOGRAMME. *See* **Gymnogramme.**

CONIUM ARRACACHA. A synonym of **Arracacha esculenta** (which *see*).

CONNECTIVE. That part of an anther which connects its two lobes; a continuation of the filament.

CONOCARPUS. A synonym of **Leucadendron** (which *see*).

CONOCLINIUM. A synonym of **Eupatorium** (which *see*).

CONOPHALLUS. Included under **Amorphophallus** (which *see*).

CONOPHARYNGIA. Included under **Tabernæmontana** (which *see*).

CONOSTEPHIOPSIS. A synonym of **Conostephium** (which *see*).

CONOSTYLIS (from *konos*, a cone, and *stylos*, a style; the style is conical at the bottom). ORD. *Hæmodoraceæ.* A genus embracing thirty-two species of greenhouse, herbaceous perennials, confined to Australia. Flowers usually dull yellow, more or less plumose-tomentose outside, in a terminal head, rarely lengthening out into a shortly dichotomous cyme. Leaves in distichous or crowded tufts on a short rhizome or on a tufted or branched stem. Several of the species have been introduced, but they are not in general cultivation.

CONOTRACHELUS NENUPHAR. *See* **Plum Insect Pests.**

CONOTRICHIA. A synonym of **Manettia** (which *see*).

CONVALLARIA. To the species described on p. 368, Vol. I., the following variety should be added. Several plants formerly known by this generic name are now referred to **Maianthemum** and **Polygonatum.**

C. majalis prolificans (prolific). An abnormal garden form, having the perianth more or less deeply divided and the lobes spreading. 1889. (R. G. 1292.)

CONVOLVULUS. Including *Rhodorhiza.* Sepals subequal, or the outer ones rarely broader; limb of the corolla plicate, five-angled or rarely five-lobed; peduncles axillary, one-flowered, or rarely cymosely many-flowered. To the species described on pp. 368-70, Vol. I., the following should be added. Several plants formerly classed hereunder are now referred to **Calystegia, Hewittia** (*see* **Palmia**), and **Ipomœa.**

C. californicus (Californian). *fl.*, corolla white, cream, or flesh-coloured, broadly funnel-shaped, 1½in. to 2in. long; peduncles shorter than the petioles. *l.* about 1in. long, varying from ovate or rounded-obovate to deltoid or sub-cordate and obtuse, or the later ones somewhat sagittate or hastate and acute, light green; petioles slender. Stems short and erect. Western California, 1888. Plant pubescent, half-hardy.

C. chrysorhizus (golden-rooted). A form of *Ipomœa Batatas.*

C. floridus (many-flowered). *fl.* white, or sometimes washed with pale rose, very numerous, in a terminal thyrse; corolla thrice exceeding the calyx, hairy outside. June to August. *l.* linear, undulated, attenuated to the petioles, obtuse and mucronulate, 3in. to 4in. long. Stems woody; branches canescent or pruinose. *h.* 6ft. Canary Islands, 1799. Greenhouse. SYN. *Rhodorhiza florida* (R. H. 1892, p. 156).

C. macrostegius (having a large covering). *fl.*, corolla pale yellow or cream-coloured, short and broad; peduncles 6in. to 8in. long, bearing two or three flowers within the ample bracts (1in. or more in length) and lateral flowers similarly bracteate. *l.* 4in. long and a little narrower. Lower California, 1895. Half-hardy under-shrub.

C. mechoacana (Mechoacan). A synonym of *Ipomœa Jalapa.*

CONYZA. *Eschenbachia* is synonymous with this genus.

CONYZA (of Schultes "Bipontinus"), in part. Synonymous with **Pluchea** (which *see*).

COOKIA (of Gmelin). A synonym of **Pimelea** (which *see*).

COOPERIA. Including *Sceptranthus.* This genus differs from *Zephyranthes* only in its stamens and in its long perianth-tube.

COPAI-YÉ WOOD. *See* **Vochysia guianensis.**

COPAL. *See* **Rhus Copallina.**

COPERNICIA. Syns. *Cryosophila* (of Blume), *Crysophila* (of Bentham and Hooker). The species are natives of Colombia, the West Indies, and Brazil. *C. nana* (Syn. *Crysophila nana*) has been introduced, but is not in general cultivation.

COPRINUS COMATUS, or **SHAGGY-CAP MUSHROOM.** This is a common and delicious Mushroom, frequently found in gardens in immense clusters, though oftener seen on paths and roads in newly-made districts. *C. comatus* should be eaten in the young stage, while the gills are whitish or purplish, for when

Fig. 275. Coprinus comatus.

specimens have assumed a black colour they are fit only for ketchup. This Mushroom is very distinctive (see Fig. 275), being of cylindrical form, with a snowy-white cap covered with woolly scales. It may be found throughout summer and autumn.

COPRIS LUNARIS. *See* **Unicorn Beetle.**

COPROSMA. Syn. *Marquisia.* Flowers regular, hermaphrodite or unisexual; corolla four- to nine-lobed, -toothed, or -parted. Fruit ovoid or globose, fleshy, with two or rarely four stones. Leaves opposite, ovate, oblong, rounded, or linear. The following is the typical form of the species to which the varieties given on p. 371, Vol. I., belong:

C. Baueriana (Bauer's). *fl.* ¼in. to ⅓in. long, capitate. *fr.* broadly ovoid, ¼in. to ⅓in. long. *l.* ½in. to 1½in. long, broadly oblong-obovate, rarely smaller and oblong-lanceolate, with recurved margins, pale below. New Zealand, 1866. A small tree or shrub.

COPTIS. About half-a-dozen species, natives of the North Temperate Zone, are included hereunder. Flowers whitish; sepals five or six, regular, petaloid, deciduous; petals five or six, small, hooded or linear; carpels numerous; scapes leafless, one- to three-flowered. Leaves radical, ternately dissected.

CORALLOBOTRYS (from *korallion*, coral, especially red coral, and *botrys*, a cluster; in allusion to the colour and shape of the inflorescence). Ord. *Vacciniaceæ.* A monotypic genus. The species is a greenhouse, epiphytal shrub, requiring similar culture to the epiphytal species of *Vaccinium.*

acuminata (taper-pointed).* *fl.* bright coral-red, corymbose; calyx lobes five; corolla ½in. long, globose-campanulate, with five recurved teeth; peduncle ½in. to ¾in. long. *l.* alternate, petiolate, lanceolate, acuminate, 5in. to 10in. long, obtusely serrated, cuneate at base; petioles ¼in. to ⅜in. long. Branches thick. *h.* 2ft. to 4ft. Khasia. Syn. *Epigynium acuminatum* (B. M. 5010).

CORCHORUS. *Mærlensia* is synonymous with this genus.

CORDIA. The species are broadly dispersed over the warmer regions of the globe, and are very plentiful in America. To those described on p. 372, Vol. I., the following variety should be added:

C. Greggii Palmeri (Gregg's, Palmer's variety).* *fl.* white, fragrant, in size and form resembling those of *C. Sebestena*, borne in terminal clusters. *l.* small, pubescent, toothed. *h.* 5ft. to 10ft. North Mexico, 1839. A showy shrub. (G. & F. 1889, ii., p. 233, f. 106.)

C. ipomœæflora (Ipomœa-flowered). *fl.* white or yellowish-white, loosely paniculate, resembling those of *C. superba*, but 1½in. in diameter. Summer. *l.* much confined to the branchlets, obovate-lanceolate, 12in. to 16in. long, 5in. broad, acute or acuminate, coarsely serrate-toothed. *h.* 12ft. to 14ft. Habitat unknown. Tree. (B. M. 5027.)

C. officinalis (officinal). A synonym of *C. Myxa.*

C. ulmifolia (Elm-leaved). *fl.* glomerate; peduncles axillary, adnate to the petiole at the base, or racemose. *l.* 2in. to 4in. long, ovate or ovate-lanceolate, acuminate, sharply serrulated above the base, scabrous above, velvety or pubescent beneath. Branchlets pubescent or velvety. *h.* 6ft. to 15ft. West Indies. Shrub.

CORDIERA. A synonym of **Alibertia** (which *see*).

CORDYLINE. Syn. *Tætsia.* The species are found in the East Indies, the Malayan Archipelago, Australia, New Zealand, and the South Pacific Islands, one being a native of Brazil. To the species and varieties described on pp. 372-5, Vol. I., the following should be added. There are many other garden forms of *C. terminalis.*

C. argenteo-striata (silvery-striated).* *l.* linear-lanceolate, bright green, striated and occasionally margined creamy-white, the bright green also relieved with streaks of silvery-grey. South Sea Islands, 1888. A form of *C. australis*, useful for table-decoration.

C. augustifolia (fine-leaved).* *l.* linear-lanceolate, arching, about 1½ft. long, 1in. broad, dark green, marked and margined with crimson and rose-colour. 1883. A good table-plant.

C. australis Doucetii (Doucet's). *l.* edged and striped with white. (I. H. xxxv., t. 40, under name of *C. indivisa Doucetiana.*)

C. a. rubra (red). *l.* bronzy, broader and more erect than in the type. 1892. Habit more compact.

C. a. Russellii (Russell's). *l.* dull brown, with a yellow midrib. 1897.

C. a. variegata (variegated). *l.* marked with longitudinal bands of creamy-white. 1881. A pretty form.

There is another variety, *lentiginosa* (I. H., t. 35).

C. Bartetii (Bartet's).* *l.* elliptic, reddish-bronze, bordered with red in the adult state; when young, brilliant red, flaked with brownish. 1886. A beautiful, garden variety.

C. Broomfieldii (Broomfield's). *l.* 1½ft. long, 2in. broad, green, margined and striped with white. Stem short, jointed, 1in. thick. South Sea Islands (?), 1896. (G. C. 1896, xx., p. 666, f. 115.)

C. Claudia. *l.* bronzy-green, flaked and margined with crimson. 1884.

C. cuprea (coppery). *l.* of a coppery brown, shaded with green; petioles salmon-rose. 1893. Probably a form of *C. terminalis.*

C. Diana. *l.* long-lanceolate, recurved, olive-green, margined, flaked, and striped with crimson-pink. 1883.

C. excellens (excellent).* *l.* bronzy, variegated with bright rosy-red, broad, oblong, drooping. 1885. A hybrid form of *C. terminalis.*

C. indivisa Dallieréana (Dallière's). An ornamental seedling variety, having the leaves striped with yellow. 1890. (I. H. xxxvii., t. 114.)

C. i. Doucetiana (Doucet's). A synonym of *C. australis Doucetii.*

C. Laingi (Laing's).* *l.* 8in. to 10in. long, 2in. to 2½in. broad; youngest ones pale green, with broad bands and margins of creamy-white, faintly tinged rose; older ones of a deeper green, bordered with crimson and white. 1882. A free-growing hybrid, useful for decorative purposes, as it bears changes of temperature better than many other kinds.

C. macrantha (large-flowered). A synonym of *Brocchinia cordylinoides.*

C. madagascariensis (Madagascar). *l.* green, long and narrow, acuminate, arching. Madagascar, 1884. A distinct form, of graceful habit.

C. norwoodiensis (Norwood). *l.* banded yellow, green, and crimson, the last-named colour being chiefly confined to the marginal portion; petioles bright carmine. 1885.

C. picturata (decorated). *l.* rich olive-green, flaked and striped with pink and crimson. 1883. An attractive form.

C. placida (placid). *l.* long, narrow-lanceolate, recurved, undulated, variegated with creamy-white. 1883.

C. Plutus. *l.* bronzy-green, flaked and margined with crimson 1884. An ornamental variety.

Cordyline—*continued.*

C. Rigoutsi (Rigouts'). This is a variegated seedling raised from *C. australis*. (I. H. 1896, p. 24, t. 50, under name of *Dracæna Rigoutsi*.)

C. Rumphii (Rumphius'). A synonym of *Dracæna Hookeriana*.

C. Thomsoniana (Thomson's).* A fine, bold, erect plant, having a head of long, bright green leaves. West Coast of Africa, 1882. A seedling from *C. terminalis*. (F. M. n. s. 441.)

C. venosa (veined). *l.* oblong-ovate, acuminate, many-ribbed, yellow-green, blotched and reticulated with dark green. Borneo, 1883. A pretty, dwarf form.

C. Williamsii (Williams'). *l.* large, oblong-lanceolate, acute, spreading and recurved, dull green, irregularly striped with chocolate, white, rose, cinnamon, and yellow. Polynesia, 1883. A distinct plant.

CORE. A popular name for the bony endocarp of a pome, containing the seeds.

COREMA. *Euleucum* and *Oakesia* (of Tuckerman) are synonymous with this genus.

FIG. 276. COREOPSIS GRANDIFLORA.

COREOPSIS. Tickseed. Including *Agarista* (of De Candolle), *Calliopsis*, *Chrysostemma*, and *Diplosastera*. Of this genus about fifty-five species are known, natives of North and South America, tropical Africa, and the Sandwich Islands. To those described on pp. 376-8, Vol. I., the following should be added. *See also* **Leptosyne** (which is kept distinct by Dr. Asa Gray).

C. abyssinica (Abyssinian).* *fl.-heads* of a rich yellow, about 1in. in diameter, freely produced; ray florets ¼in. broad; inner involucral scales coloured, hispid. *l.* thick, pinnatisect; lateral leaflets three pairs, lanceolate or linear-lanceolate, deeply toothed or almost pinnati-partite; terminal one larger. Stem erect, 2ft. or more in height, corymbose. Abyssinia, 1895. Annual.

C. aristosa mutica (beardless). *fl.-heads* bright deep yellow, without awns. *l.* turning bronzy. *h.* 3ft. United States, 1893. (R. G. 1893, p. 439.)

C. Atkinsoniana (Atkinson's). *fl.-heads* orange-yellow, spotted with brown in the centre; pappus none or minute. Autumn. *l.* all once or twice pinnately divided; lobes linear or nearly so. Stem 2ft. to 4ft. high. North America. Annual or perennial. (B. R. 1376.) SYN. *Calliopsis Atkinsoniana*.

C. ferulæfolia (Ferula-leaved). A synonym of *Bidens ferulæfolia*.

Coreopsis—*continued.*

C. japonica (Japanese). *fl.-heads* canary-yellow. *l.* linear-lanceolate. Japan, 1895. A compact-growing species.

C. longipes (long-footed). A synonym of *C. grandiflora*. See Fig. 276.

C. palmata (palmate). *fl.-heads* orange-yellow, large; ray florets obovate-oblong; involucral bracts all united at the base. July to October. *l.* palmately three-cleft, cuneiform in outline, sessile, the undivided basal portion little wider than the rather broadly linear lobes. *h.* 1ft. to 2ft. North America, 1823. Plant glabrous, rigid. Perennial. SYN. *C. præcox* (R. H. ser. ii., iv., p. 265).

C. parviflora (small-flowered). A synonym of *Cosmos sulphureus*.

C. præcox (early). A synonym of *C. palmata*.

CORETHROGYNE (from *korethron*, a broom, and *gyne*, a female; in allusion to the brush-like tuft of bristles on the style-appendages). ORD. *Compositæ*. A small genus (three species) of rather low and Aster-like, hardy perennials, cottony-tomentose when young, confined to California. Flower-heads large and showy, solitary, terminal; ray florets violet-blue or purple; disk yellow, often changing to purplish; pappus tawny or ferruginous. Leaves sessile, entire or serrated. For culture of *C. obovata*, the only species yet introduced, *see* **Aster.**

C. obovata (obovate). *fl.-heads* having the ray florets violet, varying to white suffused with pink. Summer. *l.* obovate or spathulate, obtuse, sparsely toothed above; those of the ascending branches small, oblong to linear-lanceolate. Stems decumbent, 1ft. or more in length. 1873. SYN. *C. spathulata*.

C. spathulata (spoon-shaped). A synonym of *C. obovata*.

CORIARIA. About five species of usually glabrous shrubs or under-shrubs compose this genus. To those described on p. 378, Vol. I., the following should be added:

C. japonica (Japanese). *fl.* bright rose or coral-red, sub-globose, ¼in. in diameter; racemes springing from the opposite leaf-scars of the branches, two or three together, all female or one male, 1½in. to 3in. long. June. *l.* ovate or ovate-lanceolate, acuminate, 1in. to 2in. long, two-nerved. Japan. 1896. A low, branching, half-hardy shrub. (B. M. 7509.)

C. ruscifolia (Ruscus-leaved). The correct name of *C. sarmentosa*.

C. terminalis (terminal). This differs from *C. nepalensis* in having terminal inflorescences (instead of axillary or in the forks) and five- to nine-nerved leaves. Himalayas and China. 1897.

CORK-WOOD. *See* **Anona palustris.**

CORM. A solid bulb. The enlarged base of the stem of a herbaceous plant, in which is stored a reserve of starch or other food-material; a pseudo-bulb. In substance a Corm resembles a tuber, but it is generally more upright; it produces from its upper surface leaves and buds, and from its lower, roots; *e.g.*, the Corms of Cyclamens and Crocuses. Corms are popularly but erroneously called **Bulbs** (which *see*).

CORNELIAN CHERRY. *See* **Cornus mas.**

CORNICULATE. Having an appendage or a process resembling a little spur or horn.

CORN MARIGOLD. *See* **Chrysanthemum segetum.**

CORNUS. About twenty-five species, distributed over Europe, temperate Asia and America, Mexico, and the Himalayas, are included in this genus. To those described on pp. 378-9, Vol. I., the following should be added:

C. brachypoda (short-stalked). A synonym of *C. macrophylla*.

C. capitata (headed). The correct name of *Benthamia fragifera*.

C. corynostylis (club-styled). *fl.* borne in sub-globose, white, silky-woolly corymbs; petals narrow, rather large; style club-shaped, equalling the filaments. *l.* opposite, ovate, ovate-oblong, or oblong-elliptic, acuminate, green or slightly woolly beneath. Himalayas, 1896. (R. G. 1896, pp. 11, 286, t. 54, f. 4.)

C. florida flore-rubra (red-flowered). In this variety the flowers are tinted with bright red. 1889. There is also a weeping form (*pendula*).

C. Kousa (Kousa). The correct name of *Benthamia japonica*.

C. macrophylla (large-leaved). *fl.* white; calyx tube urn-shaped, whitish with appressed hairs; panicles terminal, erect, often 4in. to 5in. in diameter. July. *l.* opposite or alternate, 6in. long, 3½in. broad, or larger, acuminate at apex, glaucous beneath, tinted with orange-red in autumn; petioles 1in. long. *h.* 40ft. Kumaon, 1827. SYN. *C. brachypoda*. There is a silvery-variegated form (*variegata*).

Cornus—*continued.*

C. mas Mietzschii (Mietzsch's). *l.* marbled, striped, and spotted with white, grey, and green. 1894.

C. sanguinea. Gaten-tree; Gater-tree; Pegwood; Prickwood. There is a variety—*foliis aureo-marginatis grandifolia*—which is remarkable for its very large, golden-variegated leaves (also for its unnecessarily cumbrous name). 1889.

C. sibirica (Siberian). A synonym of *C. tartarica.*

C. stolonifera Rosenthali (Rosenthal's). This form is variegated in a similar manner to *C. sibirica Spathi.*

C. tartarica (Tartar). *fl.* white, disposed in corymbs at the ends of the branches. July. *fr.* white. *l.* oblong-oval, veined, white on their under-sides. *h.* 8ft. Siberia, 1824. SYN. *C. sibirica.*

C. t. Gouchalti (Gouchalt's). A garden form with variegated leaves. 1888.

C. t. Spaethi (Spaeth's).* *l.* large, striped with yellow, broadly margined with bright golden-yellow. 1889. One of the best of hardy, variegated shrubs.

CORNUTE. Horn-shaped, or furnished with a horn-like process.

CORN VIOLET. *See* **Specularia hybrida.**

CORONILLA. This genus embraces about a score species, natives of Europe, North Africa, and Western Asia. To those described on p. 380, Vol. I., the following should be added:

C. cappadocica (Cappadocian). The correct name of *C. iberica.*

C. pentaphylla (five-leaved). *fl.* yellow, ten to twenty in an umbel. June and July. *l.*, leaflets five to seven, cuneiform, mucronate, often emarginate; stipules ovate, mucronate, deciduous. *h.* 2ft. to 3ft. Algiers, 1700. A glabrous greenhouse shrub.

C. Securidacea (Securidacea). A synonym of *Securigera Coronilla.*

CORREA. SYN. *Mazeutoxeron.* Five species, according to Bentham, in the "Flora Australiensis," natives of South-Eastern Australia, are included in this genus. To the information given on pp. 380-2, Vol. I., the following should be added:

C. rufa (reddish). A synonym of *C. alba.*

C. speciosa (showy).* *fl.* red, varying to white or yellowish-green, terminal, shortly pedicellate and pendulous, or a few rarely erect, solitary or two or three together; corolla cylindrical or slightly campanulate, ¾in. to 1¼in. long. Early summer. *l.* very shortly petiolate, varying from broadly ovate or cordate to narrow-oblong or lanceolate, ¾in. to 2in. long. A tomentose shrub of variable height. (A. B. R. 653; B. M. 1746; B. R. 26.) The following are regarded by Bentham as merely forms of, or garden hybrids raised from, this species: *C. bicolor, C. cardinalis* (B. M. 4912), *C. Harrisii, C. longiflora, C. pulchella* (B. 152; B. M. 4029; B. R. 1224), *C. virens* (B. M. 1901; B. R. 3), *C. viridiflora* (A. B. R. 436).

CORTADERIA (*Cortadora* is the name used for the Pampas Grass and its congeners by the Spanish-speaking people of South America). ORD. *Gramineæ.* A genus embracing four or five species of greenhouse or hardy Grasses, natives of the Andes and New Zealand, and closely allied to **Gynerium** (which *see* for culture of the following species).

C. argentea is the correct name of *Gynerium argenteum* according to Dr. Stapf (in G.C. 1897, ii., 396).

C. jubata (maned). *fl.*, spikelets ¼in. long, three- to five-flowered, the males nearly glabrous, the females silky; panicle 1ft. to 2ft. long, inclined or nodding, laxly plumose, pale straw-coloured suffused with purple; branches flexuous, the lower ones 1ft. or more in length. October. *l.* drooping on all sides, long, slender, ending in filiform points. Upper internodes more than 1ft. long. Andes, 1895. A half-hardy perennial with biennial culms. (B. M. 7607.)

CORYANTHES. About ten species, all tropical American, have been referred to this genus. To those described on p. 382, Vol. I., the following should be added:

C. Albertinæ (Albertina's). A form of *C. maculata.*

C. Bungerothii (Bungeroth's). *fl.* very large; sepals pale green, dotted with red, the dorsal one 2½in. long, the lateral ones 6in. long; lip orange, spotted with reddish-brown inside, having the front part of the very large, hood-like organ prolonged down to the level of the bucket-shaped part, which is yellow, shading to yellowish-brown and marked inside with large, reddish-brown spots. May. Venezuela, 1890. A fine species. (L. vi., t. 224.)

C. leucocorys (white-helmeted). *fl.*, dorsal sepal greenish-yellow, tinted and striped with purplish-brown, 1¾in. across, the lateral ones 2in. wide, over 4in. long, similarly coloured, curiously rolled over; petals white, obscurely purple-striped, 2¾in. long, ½in. broad, falcate; pouch of lip whitish, marbled with rosy-purple, the hood ivory-white. June. Peru, 1891. (L. vii., t. 293.)

C. macrantha. A flower of this species, which is fully described in Vol. I., is shown in Fig. 277.

Coryanthes—*continued.*

C. macrocorys (large-helmeted). *fl.* large, pale yellowish-white, spotted and dotted with purple, and having a very elongated, thimble-shaped hood at the base of the lip, streaked and spotted with purple. Peru, 1892. A very distinct species. (L. viii., t. 342.)

C. maculata punctata (dotted). *fl.* large; sepals and petals ochre-yellow, spotted wine-purple; lip with a hood-shaped body near the base, to which a large, helmet-shaped, pedunculate appendage is attached, the hood yellowish, spotted and blotched wine-purple, the pouch more heavily marked. October and November. Demerara. (B. R. 1793; W. O. A. iii. 98.)

C. m. vitrina (greenish). *fl.* of a light greenish-yellow. 1895.

Other varieties are: *Albertinæ* (F. d. S. viii., t. 755), which is practically identical with *punctata*; and *Parkeri* (B. M. 3747), in which the hypochil of the lip is of a dingy brown-purple.

FIG. 277. FLOWER OF CORYANTHES MACRANTHA.

C. Mastersiana (Dr. Masters'). *fl.* probably yellow, stained with red, the hypochil of the lip deep glowing red, in a spike 1½ft. to 2ft. high; lateral sepals 3½in. to 4in. long; lip consisting of a thick bell-shaped hypochil, a thick fleshy mesochil, and a large, bell-shaped epichil. Pseudo-bulbs two-leaved. Colombia, 1891.

C. Parkeri (Parker's). A form of *C. maculata.*

C. punctata (dotted). A form of *C. maculata.*

C. Wolfi (Dr. Wolf's). *fl.* yellow, mottled and stained with brownish-red, large, three to six in a spike, about 1½ft. high. February and March. Colombia, 1891.

C. elegantium (SYN. *C. elegantissimum*) and *C. Fieldingi* have also been introduced, but are very rare.

CORYBAS. A synonym of **Corysanthes** (which *see*).

CORYCIUM (from *korys*, a helmet; in allusion to the shape of the flowers). ORD. *Orchideæ.* A genus embracing about ten species of greenhouse, terrestrial, leafy Orchids, with undivided tubers, natives of South Africa. Flowers small or mediocre, numerous in a dense spike; dorsal sepal and petals connate, forming a helmet; lip erect or incurved, the claw adnate to the column. Leaves narrow, flat or undulate-crisped. The genus is represented at Kew by *C. orobanchoides* (B. R. 1838, t. 45), which, however, is not in general cultivation, being kept alive only with difficulty.

CORYDALIS. TRIBE *Fumarieæ* of ORD. *Papaveraceæ.* Of the dozen species embraced in this genus, six are North American and the rest inhabit West Asia or the Himalayas. To those described on p. 383, Vol. I., the following—all perennials—should be added:

C. aurea speciosa (showy). A synonym of *C. pallida.*

C. canadensis (Canadian). A synonym of *Dicentra canadensis.*

Corydalis—*continued.*

C. capnoides (smoke-like). A synonym of *C. lutea.*

C. c. alba (white). A garden synonym of *C. lutea.*

C. fabacea (Faba-like). *fl.* purple or white, somewhat numerous; bracts ovate, acute, longer than the pedicels. March to May. *l.* three or four, petiolate, biternately cleft; segments oblong, rather obtuse. Stems almost simple, erect, bearing scales below the leaves. *h.* 3ft. Europe, 1815. Tuberous. SYN. *Fumaria fabacea.*

C. fungosa (Fungus-like). A synonym of *Adlumia cirrhosa.*

C. Gortschakovii (Gortschakow's). *fl.* golden-yellow, ¾in. long; spur equalling the obtuse petals; racemes elongated, dense, terminal. *l.* bipinnatisect, the radical ones 5in. to 6in. long; segments of the lower leaves obovate-oblong, with a few deep teeth. Stem erect, leafy, very simple or branched from the base, 1ft. to 1½ft. high. Alatau and Turkestan, 1885. (R. G. 1183.)

C. longiflora (long-flowered). *fl.* pale rose-coloured, disposed in an elongated raceme; spur nearly 1in. long (longer than the pedicels), slender, subulate, slightly incurved at apex, acute; bracts oblong, entire. April. *l.* biternately cleft; segments tripartite; lobes oval-oblong. Stems simple, bearing scales. *h.* 9in. Altai, &c., 1832. Tuberous. (B. M. 3230.)

C. pallida (pale). *fl.*, sepals very small; corolla golden-yellow, with a pale brown patch on the dorsal petal, 1in. long; racemes 1in. to 5in. long, many-flowered. March. *l.* tripinnatisect; leaflets very variable, oblong, obovate, or cuneate, variously cut. *h.* 1ft. to 1½ft. China and Japan, 1884. (B. M. 6826.) SYN. *C. aurea speciosa* (R. G. 1861, 343).

C. Sewerzovi (Sewerzow's). *fl.* few, distant, on slender pedicels; corolla golden-yellow, with a brownish tip to the spur, the tube gibbously convex below. June. *l.* glaucous, rather fleshy, the lower ones opposite or in a false whorl, 9in. long or less, pinnatisect, petiolate; cauline ones large, sessile, broadly cuneate. *h.* 8in. to 12in. Western Turkestan, 1885. (B. M. 6896; R. G. 1077.)

C. tomentella (slightly tomentose).* *fl.* bright yellow, tinged with green at the tips, shortly pedicellate, disposed in simple, erect spikes 6in. to 8in. long. May and June. *l.* bipinnatisect, with oval lobes, very glaucous, pubescent. Yunnan, China, about 1894. A very good and distinct species.

C. tuberosa. This is the correct name of the plant grown in gardens and described on p. 383, Vol. I., as *C. cava.*

C. t. alba (white). The correct name of *C. albiflora.*

CORYDANDRA. A synonym of **Galeandra** (which *see*).

CORYLUS. Seven species, widely distributed over the North temperate regions, are included hereunder.

The larvæ of certain moths are sometimes very prevalent on the foliage of these trees or bushes, and unless checked work serious damage by devouring the leaves and the young tender shoots. The caterpillar most in evidence is the larva of the Winter Moth (*Cheimatobia brumata*), which should be ousted by the use of Paris Green (1oz. to twenty gallons of water). The liquid should be constantly agitated while spraying with this powerful poison.

C. humilis (dwarf). A synonym of *C. americana.*

Varieties. The best of the Cob Nuts are the following:

Atlas Cob. Nuts of very large size, shells thick, and kernel of fair quality. Worth growing for its enormous, large nuts, which are freely produced.

Daviana. Nut of medium size, shell very thin and very brown in colour, with a kernel of fine flavour. A good grower and free-bearer.

Duke of Edinburgh. Nut large, shell thick, kernel of high flavour. A variety of great promise.

Merveille de Bollwyller. Nut very large, with thick shell, nearly covered by the husks. Flavour excellent. A vigorous and great bearer.

Other good varieties are: BRUNSWICK EMPEROR, LOUIS BERGER, PRIZE EXHIBITION COB, and PEARSON'S PROLIFIC.

In Filberts, the following varieties, in addition to those already given in Vol. I., may be recommended:

Prolific. Nuts of medium size, covered with a pretty mossy husk, in very large bunches; flavour excellent. A very ornamental variety.

True Kentish. Nuts of medium size. Undoubtedly the finest-flavoured Filbert; but the tree is somewhat tender, and not a free bearer.

CORYMBIS (from *korymbos*, a corymb; in allusion to the disposition of the flowers). SYNS. *Chloidia, Corymborchis, Hysteria, Macrostylis* (of Breda), *Rhynchanthera* (of Blume). ORD. *Orchideæ.* A genus embracing six or seven species of tall, leafy, stove, terrestrial Orchids,

Corymbis—*continued.*

broadly dispersed through the tropics. Flowers mediocre or rather large, corymbose, sub-sessile; sepals, petals, and lip linear, the lip channelled, dilated at apex; column long, erect. Leaves ample. *C. veratrifolia* is in cultivation at Kew, but the genus is very little known in gardens.

CORYMBORCHIS. A synonym of **Corymbis.**

CORYNELLA (a diminutive of *koryne*, a club; in allusion to the shape of the style). SYN. *Corynitis.* ORD. *Leguminosæ.* A small genus (three or four species) of stove shrubs, natives of the West Indies, with purplish flowers and impari-pinnate leaves. *C. polyantha* has been introduced, but is probably no longer in cultivation.

CORYNITIS. A synonym of **Corynella** (which *see*).

CORYNOCARPUS. To the species described on p. 385, Vol. I., the following variety should be added:

C. lævigatus aureo-marginatus (golden-margined). *l.* broadly bordered with golden-yellow. 1886. An ornamental variety, of compact habit.

CORYPHA. SYN. *Gembanga.* Of this genus about half-a-dozen species, natives of tropical Asia and the Malayan Archipelago, have been enumerated. Flowers small, hermaphrodite; calyx cup-like, three-toothed or three-lobed; petals three; stamens six; spadix solitary, erect, paniculately much branched; spathes many, tubular, sheathing the peduncle and branches. To the species described on p. 386, Vol. I., the following should be added:

C. decora (decorative). A garden synonym of *Livistona inermis.*

C. dulcis (sweet). A synonym of *Brahea dulcis.*

C. elata (tall). *fl.* in scattered fascicles on the rather stout, spreading branches of the spadix, which is about a quarter the height of the trunk. *l.* 8ft. to 10ft. in diameter, eighty- to one-hundred-cleft to about the middle; lobes ensiform, obtuse or bifid; petioles 6ft. to 12ft. long, spirally arranged. Trunk 60ft. to 70ft. high, 2ft. in diameter. India, 1825.

C. macropoda (large-stalked). *l.* palmately flabellate, 12ft. to 20ft. in diameter, divided to the middle; petioles 18ft. to 25ft. long, slender, as thick as a man's arm at the base; spines black. Andaman Islands. Plant stemless.

C. minor (lesser), of Jacquin. A synonym of *Sabal Adansonii.*

C. Palmetto (Palmetto). A synonym of *Sabal Palmetto.*

C. Taliera (Taliera). *fl.* in close clusters; spadix 20ft. or more in height; primary branches with ascending tips. *l.* 6ft. long, 15ft. broad, ninety- to one-hundred-cleft; lobes deeper and broader than in *C. umbraculifera*, the central ones 3ft. to 3½ft. long, the basal ones overlapping; petioles 5ft. to 10ft. long, not spirally arranged. Trunk about 30ft. high. Bengal, 1823.

C. Woganii is in the Kew Collection, but is not in general cultivation.

CORYSANTHERA. A synonym of **Rhynchotechum** (which *see*).

CORYSANTHES. SYNS. *Corybas, Nematoceras.* Flower solitary, sessile within the leaf or very shortly pedicellate, with a small, subtending bract usually close to the leaf.

COSBÆA COCCINEA. A synonym of **Schizandra Hanceana** (which *see*).

COSMEA. A synonym of **Cosmos** (which *see*).

COSMIBUENA. SYN. *Buena.* This genus includes half-a-dozen species, natives of tropical America. Leaves petiolate, somewhat succulent.

COSMOPHYLLUM. A synonym of **Podachænium** (which *see*).

COSMOS. SYN. *Cosmea.* This genus embraces about ten species, mostly tropical American. To those described on p. 386, Vol. I., the following should be added:

C. atrosanguineus (dark bloody). A form of *C. diversifolius.*

C. bipinnatus albiflorus (white-flowered).* A variety with white flowers freely produced on the long growths. 1890. See Fig. 278.

C. diversifolius atrosanguineus (variable-leaved, dark bloody). *fl.-heads* dark blood-purple, ample, on very long peduncles; ray florets elliptic, three-toothed at apex; peduncles 1½ft. long. September. *l.* long-petiolate, pinnate, the lower ones 8in. to 9in. long; pinnæ five to seven, the lower ones 2in. to 2½in. long. *h.* 3ft. Mexico, 1835. Hardy perennial. (B. M. 5227.)

C. hybridus (hybrid). *fl.-heads* white or pale rose-coloured, 2½in. in diameter, disposed in large, terminal corymbs. *l.* finely cut. *h.* 6ft. to 7ft. Mexico, 1883. A very attractive annual.

Cosmos—*continued.*

C. spectabilis (showy). A garden hybrid. 1892. (R. H. 1892, p. 372, f. 114-15 and Plate.)

C. sulphureus (sulphur-coloured). *fl.-heads* sulphur-yellow; outer involucral scales appressed, shorter and narrower than the inner ones. September and October. *l.* bipinnatipartite; lobes lanceolate, mucronate, somewhat scabrous on the margins; petioles ciliated. Stems pilose. *h.* 2ft. Mexico, 1799. Hardy perennial. SYN. *Coreopsis parviflora.*

FIG. 278. COSMOS BIPINNATUS ALBIFLORUS.

COSSUS LIGNIPERDA. *See* **Goat-Moth.**

COSTUS. SYNS. *Banksea, Gissanthe, Hellenia, Jacuanga, Planera* (of Giseke). All the species of this genus are tropical; they are found in America, Africa, Asia, and Australia. To those described on p. 387, Vol. I., the following should be added. *P. albescens, P. cinereus,* and *P. lucidus,* introduced in 1868, are apparently only garden varieties.

C. cylindricus (cylindrical). *fl.* yellow, 1in. long, the lobes oblong; spike cylindrical, 4in. to 6in. long; bracts scarlet, very numerous. *l.* spathulate-elliptic, acute, glaucous beneath, yellowish-ciliated. *h.* 6ft. or more. Trinidad. A variety from Martinique has blue flowers and purple bracts.

C. discolor (parti-coloured). *fl.*, calyx and stamens purple; corolla lobes white, lanceolate; lip white, yellowish in the middle, large, three-lobed; spike inclined, oval-oblong; bracts red and green, ovate. June. *l.* elliptic-oblong, acute, sub-sessile, purplish beneath, yellow-ciliated. *h.* 4ft. Brazil, 1823.

C. Englerianus (Engler's). *fl.* white and yellow, small, produced in sessile spikes. *l.* elliptic, obtuse, fleshy, dark green. Stems short, decumbent. Tropical Africa, 1892. SYN. *C. unifolius.*

C. Lucanusianus (Dr. Von Lucanus'). *fl.* purple, with a yellow middle lobe to the lip, disposed in terminal heads. *l.* lanceolate, acuminate, white beneath. Cameroons, 1892. A tall-growing species. (R. G. 1379.)

C. musaicus (mosaic-marked). *l.* obliquely-lanceolate, 3in. to 4in. long, the centre dark green, the rest tessellated with silvery-grey. Congo, 1887.

C. pictus (painted). *fl.* yellow, with a purple-variegated, erect, three-lobed lip; spike few-flowered; bracts broadly ovate, green, appressed. July. *l.* lanceolate, pilose above. *h.* 2ft. Mexico, 1832. (B. R. 1594.)

C. unifolius (solitary-leaved). A synonym of *C. Englerianus.*

COTONEASTER. Rockspray. Including *Nagelia.* This genus comprises about fifteen species, natives of Europe, North Africa, Central and West Asia, Siberia, the mountains of the East Indies, and Mexico. Fruit small, red or dark-coloured.

Seeds of Cotoneasters germinate more freely if sown in a moderate heat immediately they are gathered. If kept until the following spring they should be placed in a cool room in preference to a warm one, as they are liable to get very dry, and vegetation is thereby hindered. The seed may be sown

Cotoneaster—*continued.*

in drills or broadcast, in beds slightly raised above the level of the ordinary ground, and thinly covered with fine soil. The ground should never be allowed to become dry, or the seed will germinate very irregularly.

To the species described on p. 387, Vol. I., the following should be added:

C. affinis (related). A synonym of *C. buxifolia.*

C. Barbeyi (Barbey's). *fl.* green and red, numerous, in an almost globular panicle; corolla about 1in. long. *l.* 3in. long, glaucous. Stem tall, branched. Arabia, 1893.

C. congesta (congested). A synonym of *C. microphylla glacialis.*

C. Fontanesii (Desfontaine's). *fl.* white, disposed in small corymbs. *fr.* bright coral-red, large, round. *l.* oval-elliptic, greyish-green and glabrous above, silvery-silky beneath. Branches pubescent. 1886. This makes a round, compact bush about 3ft. high. (R. H. 1867, p. 33.)

C. horizontalis (horizontal). *fl.* rose-coloured, large. Spring. *fr.* bright vermilion, very ornamental. *l.* small, regularly disposed, many of them turning bright red in the autumn. Branches stout, almost horizontal, somewhat frond-like. China, 1879. Deciduous. (R. H. 1879, p. 136.)

C. microphylla glacialis (ice-loving). *fl.* often pink, smaller than in the type. *l.* glabrous above, glaucous beneath. Himalayas (up to 14,000ft.), 1868. SYN. *C. congesta* (Ref. B. 51).

C. pannosa (felt-like). *fl.* white with violet stamens, disposed in compact corymbs. *fr.* ochre-red at first, becoming vermilion. *l.* oval or oblong, mucronate, ¾in. to 1¼in. long, green and pubescent above, covered beneath with a thick coating of silvery-white down. *h.* about 6ft. Yunnan, China, 1898.

C. prostrata (prostrate). A synonym of *C. rotundifolia.*

C. reflexa (reflexed). *fl.* white, numerous, in erect, umbelliform corymbs; petals orbicular. April. *fr.* of a beautiful reddish-carmine, ripening in August. *l.* ovate or ovate-lanceolate, shortly acuminate, entire, reddish-green, pubescent above, tomentose beneath. Branches slender. Origin unknown. 1892. (R. H. 1892, p. 303.)

C. Roylei (Royle's). A garden synonym of *C. acuminata.*

C. sikkimensis (Sikkim). *fl.* white, in compound umbels. *fr.* bright coral-red, globose. *l.* elliptic, 4in. to 5in. long, 2in. to 2½in. broad, entire, mucronate, dull green above, grey beneath. Sikkim, 1890. A vigorous, deciduous shrub.

C. tomentosa (downy). *fl.* pink; calyx and peduncles woolly. June and July. *l.* elliptic, obtuse at both ends, woolly beneath. *h.* 4ft. Alps, 1759. Allied to *C. vulgaris.*

C. uniflora (one-flowered). *fl.* white; calyx glabrous; peduncles very short, one-flowered, and, as well as the calyx, highly glabrous. May and June. *l.* oval-oblong, attenuated at both ends, glabrous above, puberulous beneath. Altai, 1842.

COTTONIA (named in honour of Major-General Cotton, C.S.I., of the Madras Engineers, an indefatigable collector and cultivator of Orchids, who found *C. macrostachya* in Malabar). ORD. *Orchideæ.* According to the "Flora of British India," this is a monotypic genus, the species being an interesting stove Orchid, with a lip resembling that of *Ophrys aranifera.* For culture, *see* **Vanda.**

C. Championi (Champion's). A synonym of *Diploprora Championi.*

C. macrostachya (large-spiked). *fl.* ¾in. across; sepals subspathulate; petals dirty orange, with red streaks; lip dark purple, with a villous-golden margin; scape 1ft. to 1½ft. high, erect; branches few, tipped by short racemes. May. *l.* 5in. to 6in. long, ½in. to ¾in. broad, lorate, recurved, obtusely bilobed. Stem 4in. to 8in. long, leafy. India, 1840 and 1885. (B. M. 7099.) SYNS. *C. peduncularis* and *Vanda peduncularis* (P. F. G. iii., t. 253).

C. peduncularis (pedunculate). A synonym of *C. macrostachya.*

COTULA QUINQUELOBA. A synonym of **Lidbeckia lobata** (which *see*).

COTYLEDON. According to Bentham and Hooker, this genus comprises about sixty species, natives of West and South Europe, Africa, East Asia, the Himalayas, and

Cotyledon—*continued.*

Mexico. To those described on pp. 388-90, Vol. I., the following should be added :

C. Barbeyi (Barbey's). *fl.* green and red, 1in. long, numerous in a sub-globose panicle. *l.* fleshy, glaucous, 3in. long. Stems tall, branching. Arabia Felix, 1892. Allied to *C. orbiculata.*

C. carnicolor (flesh-coloured). *fl.* bright red when mature, pentagonal, ¼in. deep; racemes six- to twelve-flowered, 1½in. long and broad. *l.* about twenty in a dense rosette, oblanceolate-spathulate, 2in. long, ¾in. broad, glaucous-green with a decided reddish tinge. Stems two or three, 6in. high. Mexico. (Ref. B. 199.)

C. Corderoyi (Justus Corderoy's). *fl.*, corolla bright red at base, yellow upwards, urceolate, ⅜in. long; cyme trichotomous, fifteen- to twenty-flowered; scapes three or four to a rosette, 1¼ft. to 1½ft. long. *l.* ovate, 2in. to 2½in. long, ½in. thick, with a firm mucro, sixty to seventy in a dense rosette, pale whitish-green. Mexico (?), 1874. SYN. *Echeveria Corderoyi.*

C. cymosa (cymose). *fl.* yellow, ⅜in. deep, twenty to thirty in a dichotomously forked cyme with erecto-patent branches. *l.* twenty to thirty in a dense rosette, oblong-lanceolate, the largest 4in. or more in length and 1in. broad, narrowed to a broad base, and upwards to an acute point. *h.* 1ft. Mexico, 1855. (Ref. B. 68.)

C. edulis (edible). *fl.* white, Sedum-like, six to seven lines in diameter, shortly pedicellate, arranged along the upper side of the flexuose, spreading branches of the cymose panicles. *l.* nearly terete or obtusely trigonal, erect, whitish or glaucous-green, but without mealiness. Stems very short, thick. California (on dry banks near the sea in San Diego), 1883. The young leaves are eaten by the Indians. SYN. *Sedum edulis.*

C. farinosa (mealy). *fl.* yellow, tinged with green, scarcely pentagonal, ¼in. to ⅜in. long, twenty to thirty in a cyme, with spreading main branches. *l.* twenty to thirty in a dense rosette, ligulate-lanceolate, the longest 2½in. to 3in. long and ⅜in. broad, acutely pointed, white-farinose when young, fading to glaucous-green with a faint reddish tinge. Flowering branch 1ft. high, with small, cordate-amplexicaul leaves. California, 1855. (Ref. B. 71.)

C. globulariæfolia (Globularia-leaved). *fl.* white with a reddish tinge, ⅜in. deep, cleft half-way down; panicle thyrsoid, dense, with cymose branches, twenty- to forty-flowered. *l.* thirty to forty in a dense, sessile rosette, the outer ones obovate-spathulate, 2in. to 2½in. long, ½in. to ¾in. broad. *h.* 8in. Syria, &c., 1869. (Ref. B. 201.)

C. hispanica (Spanish). *fl.* reddish, in terminal cymes; calyx short; corolla tube much elongated, the limb five-parted; stamens inserted in the throat of the corolla. June and July. *l.* sub-terete, oblong, sparse, sessile. *h.* 6in. Spain and Barbary, 1796. An erect, hardy annual or biennial. SYN. *Pistorinia hispanica.*

C. mamillaris (nipple-like). *fl.* as in *C. hemisphærica.* June. *l.* 1½in. to 2in. long, sub-cylindrical, crowded round the apex or scattered on the short stem, glabrous. Stem short or scarcely any. South Africa, 1818. (B. M. 6020.)

C. nodulosa (noduled). *fl.* straw-yellow, tinged with red, ½in. long, pentagonal, four to six in a lax raceme 3in. to 4in. long. *l.* obovate-spathulate, aggregated at the apex of the stem in a dense rosette, the largest 2in. to 2½in. long and ¾in. broad, dull apple-green with a slight glaucous tinge, the edges tinged with red. Stem naked, 6in. to 8in. high; flowering branches 6in. to 9in. long, with ascending leaves. Mexico. (Ref. B. 56.)

C. nuda (naked). *fl.* pink below, straw-coloured upwards and within, pentagonal, nearly ½in. long, twelve to twenty in a moderately dense raceme. *l.* obovate-spathulate, twelve to fifteen aggregated towards the apex of the stem, the largest over 2in. long and 1in. broad. Stem 6in. to 8in. high; flowering branch 6in. to 12in. long, with ascending leaves. Mexico. (Ref. B. 57.)

C. pubescens (downy). *fl.* bright red on the outside when mature, yellow within, pentagonal, ⅜in. deep, fifteen to twenty-five in a spike, the upper ones dense. *l.* obovate-spathulate, eight to twelve aggregated towards the apex of the stem, 3in. to 3½in. long, 1in. to 1½in. broad, densely white-pubescent. Stems often 1ft. to 2ft. high and 1in. thick. Mexico. (Ref. B. 197.) SYN. *Echeveria pubescens.*

C. pulverulenta (powdery). *fl.* pale scarlet or coral-colour, in a dichotomous, fastigiate panicle. May. *l.* spathulate, acuminate, very powdery; those of the stem gradually diminishing. Stem 2ft. to 3ft. high. California. (Ref. B. 66.) SYN. *Echeveria farinosa* (of gardens).

C. pumila (dwarf). *fl.* brownish-red at base, orange above, otherwise as in *C. secunda*; raceme eight- to twelve-flowered, 2in. to 3in. long. *l.* fifty to sixty in a very dense rosette, 1½in. to 2in. long, ½in. broad, mucronate, pale glaucous-green, the older ones tinged with red at apex. Flowering branches 6in. to 9in. long. Mexico. Plant stemless. (Ref. B. 62.) SYN. *Echeveria pumila.*

C. Purpusii (Purpus's). This plant is closely related to *C. pulverulenta* (*Echeveria farinosa* of gardens), but differs in having narrow, angled, pyramidal, red (not yellow) flowers. Sierra Nevada, 1896. SYN. *Echeveria Purpusii* (R. G. 1896, p. 608, f. 97; G. C. 1896, xx., p. 698, f. 123).

Cotyledon—*continued.*

C. quitensis (from Quito), of gardens. *fl.* red, produced in racemes from December onwards. 1893. A dwarf, branched, compact-growing plant, altogether different from the true *C. quitensis* of Baker.

C. reticulata (netted). *fl.* whitish, scarcely ¼in. long, the stalks persistent and forming a "mop" of much-branched, spreading spines. *l.* ¼in. to ½in. long, terete, acute or mucronate, fascicled on wart-like, abortive branchlets and at the apex of the stem. Stem 6in. to 8in. high, 1in. to 2in. thick, simple or divided. South Africa, 1897. (G. C. 1897, xxi., p. 282.)

C. sedoides (Sedum-like). *fl.* pink, few, five-parted, nearly like those of a Sedum, but gamopetalous, large for the size of the plant, sub-sessile at the tips of the branches. Summer. *l.* oblong, convex, obtuse, glabrous. Stems somewhat creeping, glabrous. Pyrenees. A small, hardy annual. SYN. *Umbilicus sedoides.*

C. stolonifera (stolon-bearing). *fl.* yellow above, pink at base, with brown marking between, pentagonal, ½in. long, four to six in a close cyme. *l.* thirty to forty in a dense rosette, obovate-spathulate, the largest 2in. to 2½in. long, half as broad, pale bright green, ⅛in. thick. Stem short; flowering branches 6in. to 8in. long, with a few leaves less than 1in. long. Mexico. (Ref. B. 63.)

COUBLANDIA. A synonym of **Muellera** (which *see*).

COUCH GRASS (*Triticum repens*). A noxious weed, very troublesome on agricultural land, but it is not so difficult to eradicate from a garden. One of the most effectual modes is to heavily manure a piece of ground infested, and plant with Brussels Sprouts, Kale, or Broccoli. These make strong growth and large foliage that smother the Couch Grass. Other methods are careful forking out all pieces as they appear, and burning them at once. Much may be done by carefully collecting all pieces seen when digging the ground, and by preventing plants from going to seed.

COUMAROUNA ODORATA. A synonym of **Dipteryx odorata** (which *see*).

COUNTRYMAN'S TREACLE. *See* **Ruta graveolens.**

COUSSAPOA (from *Coussapoui*, the Caribbean name of two of the species). ORD. *Urticaceæ.* A genus of stove, milky trees or shrubs, sometimes climbing over trees or epiphytal; eighteen species have been described, natives of tropical South America, but according to Bentham and Hooker this number might be reduced. Flowers dicœcious, borne in a globose head; peduncles solitary or in pairs, axillary, the male heads few-flowered, often dichotomously paniculate, the female peduncles shorter, bearing one large head or a few clustered smaller ones. Fruit included, oblong. Leaves alternate, petiolate, entire, coriaceous, penniveined or three-nerved. For culture, *see* **Ficus.**

C. dealbata (whitened).* The correct name of the plant described on p. 12, Vol. II., as *Ficus dealbata.*

COUTAREA. This genus embraces about five species. Flowers showy, odorous, terminal, solitary or in cymes of three; calyx and corolla each with five or six lobes; stamens five or six. Leaves opposite, shortly petiolate, membranous, ovate, acuminate; stipules short, acute. To the species described on p. 390, Vol. I., the following should be added :

C. Scherffiana (Scherff's).* *fl.* white, solitary, disposed in leafy cymes; corolla 2in. long, tubular-campanulate, ribbed, with spreading lobes. *l.* shortly petiolate, ovate, acuminate, attenuated at base, flat, shining; stipules broadly triangular. Branches divaricate. Colombia, 1876. A tall shrub. (I. H. 1878, t. 321.)

COUVE TRONCHUDA (*Brassica oleracea costata*). An excellent vegetable, not so well known in British gardens as its merits warrant. For first supplies, seeds should be sown early in February in gentle heat, and when large enough to handle the seedlings should be pricked in rich soil, afterwards gradually hardening the plants off and planting out in deeply-dug and rich ground, 3½ft. apart each way. About the middle of March, a further sowing should be made in a cool frame or warm border outside, protecting the seeds from birds, and transplanting the plants when large enough to liberally-manured ground, at the distance apart named above. As the plants grow, diluted liquid manure applied occasionally will be of considerable value, so will also an application of 1oz. of nitrate of soda per square yard. Either or both of these will induce strong growth, a point to be aimed at, as the midribs of the large leaves are the best part of the vegetable when cooked in the same way as Sea Kale, and are of a most agreeable and distinct flavour.

COVELLIA. Included under **Ficus** (which *see*).

COW-BELL. *See* **Silene inflata.**

COW-HERB. *See* **Saponaria Vaccaria.**

COWHORN ORCHID. *See* **Schomburgkia tibicinis.**

COWSLIP (*Primula veris*). When cultivated in gardens the plant produces very large trusses, which are sweetly scented. The culture is similar to that of the common Primrose and Polyanthus.

COW'S LUNGWORT. *See* **Verbascum Thapsus.**

COW-TREE. *See* **Brosimum.**

CRACKING OF FRUIT. This condition is very familiar alike on fruits grown under glass and in the open. In the former case, Grapes are chiefly affected, and as such berries are both unsightly and not very saleable, an endeavour must be made to combat the evil. Cracking usually arises in the case of Grapes from imperfect ventilation, overfeeding, and an excess of moisture in the atmosphere and at the roots. It is especially prevalent when such conditions follow a somewhat dry period. Frequently a strong application of natural or of chemical manure will induce thin-skinned varieties to Crack badly. A similar condition may be induced by a saturated border, which previous to watering was rather dry. Again, Cracking may be the result of fungus attacks, to which the conditions named above may predispose the Vines.

With hardy fruit, Cracking is very common upon Apples and Pears. Then it is due to the presence of a well-defined fungus, *Fusicladium dendriticum*, to which attention has already been directed under **Apple and Pear Scab.**

CRACK WILLOW. *See* **Salix fragilis.**

CRANBERRIES. There are several varieties of Cranberries (*Oxycoccus*), notably the following American sorts—Bugle, Bell, Cherry, and the one known as the American Cranberry (*O. macrocarpus*). The fruit is rather sour, but when cooked in tarts, &c., with sufficient sugar to sweeten, it is usually appreciated. When once established, little or no further attention is required, except preventing other trees or bushes from smothering the tough, wiry growths. The fruit, which is ripe in September, varies in colour from red to purple, and in form from round to oval. Propagation is usually effected by division in the early spring.

In England the cultivation of the Cranberry has not been seriously attempted, though those best capable of judging contend that it could be grown to profit. In America the growing of the berries for market is an important industry, Massachusetts and New Jersey being the chief centres. In America the land for growing Cranberries is flooded from Autumn to May with from 18in. to 2ft. of water. On the first of the latter month the water is drained away, and the plants soon put forth their blossoms. It is probably owing to the irrigation of the land being necessary that the profitable culture of the fruits has not been attempted on anything of a scale in England.

CRANEFLY, or **DADDY LONG-LEGS** (*Tipula oleracea*). These pests are amongst the worst against which grass-growers have to contend. They are, however, injurious to many other crops besides those noted in Vol. I. Strawberry-plants are often badly attacked; while corn and leguminous crops like Clover, Peas, and Beans suffer considerably in some seasons. For grass land, soot and lime, in the proportion of three parts of the former to one of the latter, have proved of service, and similarly in the case of Strawberries affected. In the latter case it is usual to trim the plants close, and hoe in the soot and lime. In the case of lawns, in addition to dressings of soot and lime, they should be rolled every evening towards dusk, as then thousands of insects will be destroyed as they emerge, and before they have an opportunity of depositing their eggs.

CRANIOLARIA ANNUA. A synonym of **Martynia proboscidea** (which *see*).

CRANTZIA (of Scopoli). A synonym of **Alloplectus** (which *see*).

CRANTZIA (of Vellozo). A synonym of **Centratherum** (which *see*).

CRAPE FERN. *See* **Todea.**

CRASPEDIA (from *kraspedon*, a fringe; in allusion to the form of the pappus). SYN. *Richea* (of Labillardière). ORD. *Compositæ*. A genus consisting of five species of greenhouse, silvery-silky, woolly or nearly glabrous, perennial herbs, mostly natives of Australia and New Zealand. Flower-heads yellow or whitish, few-flowered, homogamous; florets tubular, five-toothed; involucre consisting of many or few scarious bracts; receptacle very narrow. Leaves alternate or radical, entire. *C. Richea*, the only species known in gardens, is best treated as a half-hardy annual.

C. pilosa (pilose). A synonym of *C. Richea*.

C. Richea (Richea). *fl.-heads* yellow, in solitary, depressed-globular clusters ¾in. to 1in. in diameter. *l.*, radical ones ovate-oblong to lanceolate, several inches long, narrowed to a long petiole; cauline ones narrow, stem-clasping. *h.* 1ft. Australia, 1881. Plant usually woolly- or silky-white. (B. M. 5271.) SYN. *C. pilosa* (B. R. 1908).

C. R. macrocephala (large-headed). *fl.-heads* in larger clusters. Plant tall and nearly glabrous. (B. M. 3415, under the name of *C. macrocephala*.)

CRASPEDOLEPIS. A synonym of **Restio** (which *see*).

CRASSINA. A synonym of **Zinnia** (which *see*).

CRASSULA. Thick-leaf. Bentham and Hooker include the following under this genus: *Dasystemon*, *Globulea*, *Kalosanthes*, *Petrogeton*, *Septas* (of Linnæus), and *Turgosea*. Leaves opposite, rarely petiolate, often connate, fleshy, entire and cartilaginous-margined, glabrous, pubescent, or scaly. *C. coccinea*, *C. jasminea*, *C. odoratissima*, and *C. versicolor* are now referred to **Rochea,** which should not be included here. To the species described on pp. 391-2, Vol. I., the following should be added:

C. abyssinica (Abyssinian). *fl.* pure white, with an odour resembling that of Hawthorn, disposed in abundantly-produced corymbs. Habit tree-like, approaching that of *C. coccinea*, but more woody. Tropical Africa. (G. M. 1888, p. 823.)

C. aloides (Aloe-like). *fl.* pale yellow, small; scape 3ft. to 4ft. high, bearing a corymb 1½ft. across. *l.* green, fleshy, 1ft. or more in length, 2in. wide at the base. Transvaal, 1896. This species has much the appearance of an Aloe.

C. columnaris (columnar). *fl.*, pure white, in a dense, capitate cyme. *l.* fleshy, orbicular, imbricated. Stem short, erect. *h.* 3in. Allied to *C. pyramidalis*. (G. C. 1898, i., f. 23.)

C. Cooperi (Cooper's). *fl.* deep carmine, produced in abundance. Habitat not recorded, 1897.

C. hybrida albiflora (white-flowered hybrid). *fl.* white, small; corymb very many flowered. *l.* triangular, fleshy. *h.* 10in. Plant erect. An interesting hybrid between *C. jasminea* and *Rochea odoratissima*.

C. impressa (marked). *fl.* disposed in loose, dichotomously-branched corymbs; petals white at base, red above, free, elliptic-oblong; peduncles and pedicels glabrous. *l.*, radical ones crowded, somewhat rosulate, oblong, linear-lanceolate, or nearly linear; cauline ones linear, opposite; all succulent, glabrous, and, as well as the stems, more or less suffused with purple. Stems tufted, 2in. to 3½in. long. 1886. SYN. *C. Schmidti* (R. G. 1225).

C. recurva (recurved). *fl.* crimson, disposed in flat-topped cymes. *l.* greyish-green, mottled with purplish-crimson. Stems 1ft. high. Zululand, 1890. This species resembles *C. rubicunda*.

C. rhomboidea (rhomboid). *fl.* pale flesh-coloured; cymes short-stalked, terminal, few-flowered, ¾in. to 1in. across. *l.* rhomboidal, hunched above the middle, sub-acute, ¼in. to ½in. thick, glaucous, dotted. *h.* 2in. to 3in. Transvaal, 1886. Plant glabrous. Of botanical interest.

C. Schmidti (Schmidt's). A synonym of *C. impressa*.

C. Schweinfurthii (Schweinfurth's). A dwarf, tufted species, with white flowers. Abyssinia, 1892.

CRATÆGUS. One or two species formerly included here are now referred to **Photinia** and **Pyrus.** To the species and varieties described on pp. 393-4, Vol. I., the following should be added:

C. Bruanti (Bruant's). A synonym of *C. Oxyacantha semperflorens*.

C. Carrierei (Carrière's). A variety of *C. mexicana*.

C. Crus-galli pendula (pendulous). Branches slender, pendent at the extremities. There are several other varieties.

C. elliptica (elliptic). A synonym of *C. flava*.

C. ferox (fierce). A synonym of *C. horrida*.

C. grignonensis (Grignon). *fr.* yellowish-green or lemon-yellow, tinted with reddish. *l.* lanceolate. 1890.

C. horizontalis (horizontal). A synonym of *C. Crus-galli linearis*.

C. Lavallei (Lavallé's). *See* **C. mexicana Carrierei.**

C. leucophlœos (white-barked). A synonym of *C. tomentosa*.

Cratægus—*continued.*

C. mexicana Carrierei (Carrière's). *fl.* at first white, subsequently becoming flesh-coloured. Spring. *fr.* bright red, resembling cherries, persistent throughout the winter. 1883. A handsome tree, of garden origin. (G. C. 1888, iv., p. 736, f. 104, and R. H. 1883, 103, under name of *C. Carrierei.*) *C. Lavallei* is very similar to, if not identical with this.

C. Michauxii (Michaux's). A synonym of *C. flava.*

C. monogyna (one-styled). A form of *C. Oxyacantha.*

C. Oliveriana (Oliver's). A synonym of *C. melanocarpa.*

C. Oxyacantha atrofusca (very dark). *fl.* pure white, medium-sized. A very beautiful, weeping variety.

C. O. flore-pleno. Of the double-flowered variety there are three forms—*coccinea*, with scarlet-, *lucida*, with white-, and *rosea*, with rose-coloured flowers.

C. O. flore-puniceo (reddish-brown flowered). *fl.* red, single, very attractive, freely produced.

C. O. foliis-tricoloribus (three-coloured-leaved). *l.* variegated with different shades of dark red, carmine, and rose. 1886. An ornamental garden variety.

C. O. Gumperi (Gumper's). *fl.* white, bordered with pink.

C. O. integrifolia (entire-leaved). A variety having undivided leaves.

C. O. monogyna (one-styled). *fl.*, calyx lobes lanceolate, acuminate, not glandular. *fr.* almost globular, having only one style and one stone. *l.* deeply tri-quinquefid, incised-toothed. Europe, &c. There are several sub-varieties of this.

C. O. rosea-superba. There is a sweet-scented double variety called *plena.*

C. O. semperflorens (ever-flowering).* A useful garden variety, flowering throughout the summer; towards autumn plants may be seen with nearly ripe fruit, green fruit, and open flowers at the same time. SYN. *C. Bruanti.*

C. O. stricta (erect). A pyramidal variety with fastigiate branches.

C. oxyacanthoides (Oxyacanthus-like). A synonym of *C. Oxyacanthus.*

C. pentagyna (five-styled). *fl.* white, in erect, somewhat pointed corymbs; peduncles and base of calyx sparingly beset with shaggy hairs. *l.* broadly oval, divided on each side into from two to four long, pointed, toothed lobes, glabrous above, hairy on the nerves beneath. A tall, thorny bush. The earliest of all the Thorns to come into leaf. SYN. *C. pinnatifida* (R. G. 366).

C. p. major (greater).* *fl.* white, large, corymbose. *fr.* bright red, pear-shaped, ⅜in. in diameter. *l.* long-stalked, lobed, and pinnatifid. North China, 1886. An ornamental form. (G. C. n. s., xxvi., p. 621, under name of *C. pinnatifida major.*)

C. pinnatifida (pinnatifid). A synonym of *C. pentagyna.*

C. prunifolia (Prunus-leaved). A variety of *C. Crus-galli.*

C. Pyracantha crenulata (slightly crenate). A yellow-berried variety.

C. P. Lelandi (Leland's).* *fr.* bright orange-scarlet, produced when the plant is but a few inches in height. 1888.

C. P. pauciflora (few-flowered). *fl.* few in corymb. *fr.* reddish-yellow. Branches very spiny. A dwarf, tufted variety, useful for hedges or for the rockery.

C. pyrifolia is a variety of *C. tomentosa.*

C. stipulacea (large-stipuled). *fl.* white, on downy pedicels, disposed in dense corymbs. *l.* glabrous, downy on the nerves beneath; lower ones lanceolate or oblong, acute, strongly toothed at the summit; those at the tips of the branches pinnatifid, with three divergent lobes; stipules very large, persistent, slightly toothed. *h.* 3ft. to 6ft.

C. tomentosa (downy). *fl.* in broader, looser, pubescent corymbs, with a disagreeable scent, and, as well as the smaller, oblong, upright, fruit, later. *l.* thicker, without glands, densely pubescent beneath. Branches pale grey, without thorns. Otherwise like *C. coccinea.* United States, 1882. SYN. *C. leucophlœos.*

CRATERIFORM. Goblet-shaped.

CRATEROSTIGMA (from *krateros*, strong, stout, and *stigma*; in allusion to the conspicuous stigma). ORD. *Scrophularineæ.* A small genus (two or three species) of dwarf, almost stemless, stove or greenhouse perennials, natives of South and tropical Eastern Africa, and closely allied to *Torenia.* Flowers spicate, racemose, or rarely solitary: calyx tubular, five-ribbed, five-toothed; corolla tube enlarged above, the dorsal lip concave, entire or emarginate, the anterior one spreading, with three broad lobes; style somewhat funnel-shaped at apex. Leaves radical, Plantain-like, many-nerved, entire. Only one species calls for mention here. For culture, *see* **Torenia.**

C. pumilum (dwarf). The correct name of the plant described on p. 59, Vol. IV., as *Torenia auriculæfolia.* Its habitat is Abyssinia.

CRAWFURDIA. SYN. *Golowninia.* Corolla tubular-campanulate or almost funnel-shaped, the limb four- or five-lobed; stamens four or five; disk shortly five-lobed or wanting.

CREAM FRUIT TREE. *See* **Roupellia grata.**

CREAM-SPOTTED TIGER MOTH. *See* **Tiger Moths.**

CREEPING SNOWBERRY. *See* **Chiogenes.**

CREMATOMIA. A synonym of **Bourreria** (which *see*).

CRENATURE. One of the teeth of a crenate margin.

CREPIDIUM. A synonym of **Microstylis** (which *see*).

CRIMSON CLOVER. *See* **Trifolium incarnatum.**

CRIMSON FLAG. *See* **Schizostylis coccinea.**

CRINITA (of Houttuyn). A synonym of **Pavetta** (which *see*).

CRINITE. Furnished with a tuft or fringe of long, weak hairs.

CRINUM. Of this genus seventy-nine species are described by J. G. Baker, in his "Handbook of the *Amaryllideæ*"; they are broadly dispersed over the tropical and sub-tropical regions of the globe. Flowers white or reddish, few or numerous in an umbel, large, sessile or shortly pedicellate; stamens affixed to the throat. Leaves persistent, usually broad. To the species described on pp. 396-7, Vol. I., the following should be added. Except where otherwise stated, stove treatment is required:

C. abyssinicum (Abyssinian). *fl.* white, fragrant, four to six in an umbel; perianth tube slender, curved, 1½in. to 2in. long, the limb horizontal or sub-erect, 2in. to 3in. long, the segments ½in. to ⅝in. broad; peduncle 1ft. to 2ft. long. *l.* about six, bluish-green, linear, sub-erect, 1ft. long, ½in. to 1in. broad, gradually narrowed. Bulb ovoid, 3in. in diameter. Abyssinia, 1892. Greenhouse. (R. G. 1892, p. 412, f. 89.)

C. amabile augustum (august). A synonym of *C. augustum.*

C. angustifolium blandum (charming). *fl.*, perianth segments broader than in the type; filaments whitish. *l.* also broader. SYN. *C. blandum* (B. M. 2531).

C. a. confertum (clustered). *fl.* sessile; perianth segments 4in. long, a little exceeding the tube. SYN. *C confertum* (B. M. 2522).

C. anomalum (anomalous). A form of *C. asiaticum.*

C. blandum (charming). A variety of *C. angustifolium.*

C. brevifolium (short-leaved). A synonym of *C. bracteatum.*

C. Broussonetii (Broussonet's). A synonym of *C. yuccæfolium.*

C. capense. This is regarded by J. G. Baker as identical with **C. longifolium.*

C. Colensoi (Colenso's). A garden synonym of *C. Moorei.*

C. confertum (clustered). A variety of *C. angustifolium.*

C. crassipes (thick-stalked). *fl.* fifteen to twenty in an umbel; perianth tube green, curved, 3in. long, the limb sub-erect, 2½in. long, the segments white, ½in. broad, with a pink keel; pedicels 1in. to 1½in. long; peduncle compressed, less than 1ft. long, ⅜in. thick. July. *l.* lorate, bright green, sub-erect, 4in. broad. Bulb very large, conical. Tropical or sub-tropical Africa (?), 1887. Stove or intermediate.

C. cruentum Loddigesii (Loddiges'). *fl.*, perianth segments tipped dark purple; pedicels as long as the ovary.

C. declinatum (declinate). A form of *C. asiaticum.*

C. distichum (two-ranked). *fl.* usually solitary, sessile; perianth tube curved, 5in. to 6in. long, the limb horizontal, about 4in. long, the segments keeled bright red, oblong, acute, connivent, 1in. broad; stamens and style nearly reaching the tips of the segments; peduncle about 1ft. long. June. *l.* about ten, distichous, linear, firm, channelled down the face, tapering, 1ft. long. Bulb small, globose. Sierra Leone. SYN. *Amaryllis ornata* (B. M. 1253).

C. Doriæ (Doria's). *fl.* white, striped with red, scented, many in an umbel; scape short. *l.* broad, wavy at the margins. Abyssinia, 1893. Stove.

C. elegans (elegant). A variety of *C. pratense.*

C. ensifolium (ensate-leaved). A variety of *C. defixum.*

C. falcatum (sickle-shaped). A synonym of *Ammocharis falcata.*

C. firmifolium (firm-leaved). *fl.* six to eight in an umbel; perianth tube straight, 5in. to 6in. long, the segments linear, 2in. to 2½in. long; peduncle 1ft. long. *l.* narrow, lorate, firm, 3ft. long, 1½in. broad, gradually tapering, with entire margins. Madagascar, 1892.

Crinum—*continued.*

C. flaccidum (flaccid). *fl.* six to eight in an umbel; perianth tube 3in. to 4in. long, usually curved, the segments pure white, oblong-lanceolate, about as long as the tube, ⅔in. broad, acute; stamens much shorter than the segments; pedicels 1in. to 1½in. long; peduncle 1½ft. to 2ft. long, much compressed. July. *l.* linear, 1½ft. to 2ft. long, 1in. to 1½in. broad. Bulb ovoid, 3in. to 4in. in diameter, with a very short neck. New South Wales and South Australia, 1819. Greenhouse. (B. M. 2133.) SYN. *Amaryllis australasica* (B. R. 426).

C. giganteum. SYNS. *C. vanillodorum, Amaryllis ornata* (B. M. 923).

C. grandiflorum (large-flowered). A garden hybrid between *C. Careyanum* and *C. capense* (*C. longifolium*). Half-hardy.

C. Hildebrandtii (Hildebrandt's). *fl.*, perianth pure white, erect; tube 6in. to 7in. long; limb segments horizontally spreading, 2in. to 3in. long, less than ½in. broad; umbel six- to ten-flowered; peduncle ancipitous, about 1ft. long. September. *l.* eight or ten, contemporary with the flowers, lanceolate, firm, 1½ft. to 2ft. long. Bulb 2in. to 3in. in diameter; neck 6in. long. Comoro Islands. (B. M. 6709.) A variety with more numerous flowers is figured in I. H. 1886, 115.

C. humile (dwarf). *fl.* six to nine in an umbel, cernuous in bud; perianth tube greenish, 3in. long, the segments white, linear-lanceolate, spreading, 2in. long, ½in. broad; filaments bright red; rather longer than the perianth segments; pedicels short; peduncle slender, 1ft. long. October. *l.* linear, 1ft. long, spreading, sub-acute, thicker than in *C. amœnum*, pitted over the face. Bulb small, globose, greenish, with a very short neck. Tropical Asia, 1826. (B. M. 2636.)

C. insigne (remarkable). A slight variety of *C. latifolium.*

C. jemense. *fl.* pure white, in large umbels. *l.* broad, shining green. Arabia, 1892. A handsome plant.

C. Kircape. A name given to a garden hybrid between *C. Kirkii* and *C. capense (longifolium).*

C. Kunthianum (Kunth's). *fl.* white, fragrant, four or five in an umbel; perianth tube 7in. to 8in. long, the segments lanceolate, 2½in. long; peduncle 1ft. long. *l.* about twenty to a bulb, lorate, spreading, bright green, 12in. to 20in. long, 2in. to 3in. broad, undulated towards the entire margin. Bulb ovoid, 3in. in diameter, with a short neck. Colombia, 1890.

C. Laurenti (Laurent's). *fl.* white, about four in an umbel; tube 6in. long. Congo, 1897. A species very nearly allied to *C. giganteum.* Greenhouse.

C. Lesemanni (Lesemann's). A synonym of *C. Powellii*, the plant bearing this name being of the same parentage.

C. leucophyllum (white-leaved). *fl.* pinkish, fragrant, forty or fifty in a dense, centripetal umbel; perianth tube cylindrical, 3in. long, the segments linear, spreading, rather shorter than those of the tube; scape springing from below the leaves, 1ft. long. August. *l.*, produced ones about twelve or fourteen, arranged in a distichous column about 1ft. long, lanceolate, 1½ft. to 2ft. long, 5in. to 6in. broad, whitish-green, denticulate Bulb nearly 6in. in diameter. Damara-land, 1880. (B. M. 6783.)

C. lineare (linear). *fl.* five or six in an umbel; perianth tube slender, curved, 1½in. to 2½in. long, the segments tinged red outside, oblanceolate, acute, 2in. to 3in. long, ½in to ½in. broad; pedicels ½in. to ⅔in. long; peduncle slender, sub-terete, 1ft. long. September. *l.* linear, 1½ft. to 2ft. long, ½in. broad, glaucous-green, channelled down the face. Bulb small, ovoid. Cape Colony. SYNS. *Amaryllis revoluta* (B. M. 915), *A. r. gracilior* (B. M. 623).

C. Loddigesii (Loddiges'). A variety of *C. eruentum.*

C. longifolium. *C. capense* is synonymous with this species.

C. l. Farinianum (Farini's). *fl.* five or six in an umbel; perianth tube greenish, 3½in. to 4in. long, the segments pink, connivent in a narrow funnel 3in. long; scape 2ft. high. *l.* ensiform, 3ft. to 4ft. long, acuminate, glaucescent, entire. Bulb 2½in. to 3in. in diameter, narrowed into a neck 6in. long. 1887.

C. longifolium, of Roxburgh. A synonym of *C. pratense.*

C. Mackenii (Macken's). A garden synonym of *C. Moorei.*

C. Massaiana (Duc de Massa's). *fl.* white, each perianth segment having a central stripe of dull rose-colour. 1887. (I. H. 1887, 55, under the name of *Brunsvigia Massaiana.*) This "is no doubt a Crinum, nearly allied to *C. Kirkii*" (J. G. Baker).

C. moluccanum (Moluccas). A slight variety of *C. latifolium.*

C. Moorei Schmidtii (Schmidt's). A form with pure white flowers. SYN. *C. Schmidtii* (R. G. 1072).

C. M. variegatum (variegated). In this variety the leaves are striped with yellow. 1895.

C. natalense (Natal). A garden synonym of *C. Moorei.*

C. plicatum (folded). A form of *C. asiaticum.*

C. Powellii (Powell's).* *fl.* about eight in an umbel; perianth tube greenish, curved, 3in. long, the segments reddish, oblanceolate, acute, 4in. long, 1in. broad; stamens much shorter than the perianth segments; peduncle compressed, glaucous, 2ft. long. *l.* about twenty, spreading, ensiform, acuminate, bright green, 3ft. to 4ft. long, 3in. to 4in. broad low down. Bulb globose,

Crinum—*continued.*

with a short neck. A garden hybrid (of which there are several forms) between *C. longifolium* and *C. Moorei.* Hardy in the South of England.

C. P. alba (white).* A splendid white-flowered variety, with eight to fifteen blossoms in an umbel. 1893.

C. pratense (meadow-loving). *fl.* six to twelve in an umbel; perianth tube greenish, 3in. to 4in. long, at first curved, the segments white, lanceolate, nearly or quite as long as the tube, ½in. broad; filaments bright red, rather shorter than the segments; pedicels none or very short; peduncle lateral, 1ft. or more in length. June and July. *l.* six to eight to a bulb, linear, sub-erect, 1½ft. to 2ft. long, 1½in. to 2in. broad, narrowed to the point, channelled on the face. Bulb ovoid, 4in. to 5in. in diameter, with a short neck. India, 1872.

C. p. elegans (elegant). *fl.*, perianth tube 1in. shorter than the segments; peduncle decumbent. Bulb with a longer neck than in the type. SYN. *C. elegans* (B. M. 2592).

C. procerum (tall). A form of *C. asiaticum.*

C. Roozenianum (Roozen's). *fl.* white, reddish on the outside, four to twelve in an umbel; filaments red. *l.* 2½in. to 3½in. long. Jamaica, 1891. This plant is described as "near *C. americanum*, though the growth is something like that of *C. erubescens.*" (R. H. 1894, p. 120, f. 47.)

C. Sanderianum (Sander's). *fl.* sessile, borne in umbels of three or four together; perianth segments white, with a broad, conspicuous band of reddish-crimson down the centre, lanceolate, spreading-recurved. *l.* ensiform, 1ft. to 1½ft. long. Bulb globose, 2in. in diameter. Sierra Leone, 1884. A beautiful plant. (F. & P. 1884, p. 156.)

C. Schimperi (Schimper's). *fl.* few in an umbel; perianth tube reddish-green, cylindrical, 4in. long, the limb pure white, funnel-shaped, 4in. long, the lobes oblanceolate, acute; peduncle brownish, 2ft. long. July. *l.* eight to ten, linear, recurving, glabrous, 3ft. long, 2in. broad, green above, glaucous beneath. Mountains of Abyssinia, 1894. Half-hardy. (B. M. 7417; R. G. 1309.)

C. Schmidtii (Schmidt's). A form of *C. Moorei.*

C. sinicum (Chinese). A form of *C. asiaticum.*

C. speciosum (showy). A slight variety of *C. latifolium.*

C. spirale (spiral). A synonym of *Carpolyza spiralis.*

C. strictum (narrow). *fl.* about four in an umbel; perianth tube pale green, sub-erect, about 5in. long, the segments white, lanceolate, 3in. to 4in. long, ½in. broad; filaments red, 1in. shorter than the segments; pedicels none or very short; peduncle green, twice as long as the leaves. September. *l.* lorate, pale green, sub-erect, 1ft. long, 2in. to 2½in. broad. Bulb small, ovoid, without any distinct neck. South America. (B. M. 2635.)

C. sumatranum (Sumatra). *fl.* ten to twenty in an umbel; perianth tube greenish, erect, 3in. to 4in. long, the segments not tinged red outside, linear, as long as the tube; filaments bright red, much shorter than the segments; pedicels very short; peduncle much shorter than the leaves. July. *fr.* as large as a man's fist, one- to three-seeded. *l.* ensiform, sub-erect, 3in. to 4in. broad, gradually narrowed to a point, firm, dark, dull green, the edges serrulated. Bulb ovoid, as large as in *C. asiaticum.* Sumatra. (B. R. 1049.)

C. taitense (Tahiti). A synonym of *C. pedunculatum.*

C. undulatum (wavy). *fl.* four in an umbel; perianth tube greenish, 7in. to 8in. long, curved before the flower expands, the segments not purple outside, lanceolate, undulated, erecto-patent, 3in. long; filaments bright red, 2in. long; pedicels none or very short; peduncle 1ft. long. November. *l.* dark green, ensiform, firm, sub-erect, 1½ft. long, 1in. broad. Bulb small, ovoid, with a long neck. North Brazil. (H. E. F. 200.)

C. vanillodorum (Vanilla-scented). A synonym of *C. giganteum.*

C. variabile (variable). *fl.* ten to twelve in an umbel; perianth tube greenish, curved, 1½in. to 2in. long, the segments flushed red down the back, oblong, acute, 2½in. to 3½in. long; filaments red, 1in. shorter than the segments; pedicels ½in. to 1in. long; peduncle erect, compressed, 1ft. to 1½ft. long. April. *l.* ten to twelve to a bulb, linear, green, weak, 1½ft. to 2ft. long, 2in. broad. Bulb ovoid, 3in. to 4in in diameter, with a short neck. Cape Colony. SYNS. *C. v. roseum* (B. R. 1844, 9), *Amaryllis revoluta robustior* (B. R. 615).

C. v. roseum (rosy). A synonym of *C. variabile.*

C. Woodrowi (Woodrow's). *fl.* about twelve in an umbel; perianth white, having a long tube; scape 2ft. long. *l.* broad, glaucous. Bulb large, ovate, brown, with scarcely any neck. Bombay, 1897. (B. M. 7597.)

C. yuccæflorum (Yucca-flowered). *fl.* one or two in an umbel, sessile; perianth tube greenish, curved, 4in. to 5in. long, the limb horizontal, 3in. to 4in. long, the segments oblong, acute, connivent, banded red on the back; filaments 1in. shorter than the segments; peduncle slender, 1ft. long. June. *l.* ten to twelve to a bulb, multifarious, linear, firm, 1ft. to 1½ft. long, about 1in. broad. Bulb small, globose, purplish. Sierra Leone, 1785. SYNS. *C. Broussonetii* (B. M. 2121; L. B. C. 668), *C. yuccæoides, Amaryllis spectabilis* (A. B. R. 390).

Crinum—*continued.*

C. yuccæfolium (Yucca-leaved). A greenhouse plant, very similar to *C. abyssinicum*, but smaller in all its parts. Abyssinia, 1892.

C. yuccæoides (Yucca-like). A synonym of *C. yuccæflorum.*

C. zeylanicum reductum (reduced). *fl.* about four in an umbel, sessile; perianth white, with a red, central stripe on each segment; scape lateral, less than 1ft. long. *l.* ensiform, spreading, 1ft. to 1½ft. long, 1¼in. to 1¾in. broad, gradually narrowed from middle to apex, the edges not ciliated. Zanzibar, 1884.

CRIOSANTHES. A synonym of **Cypripedium** (which *see*).

CRISP, CRISPED. Curled; finely undulate, especially near the margin; *e.g.*, the leaves of garden Endive or of Savoy Cabbages.

CROCIRIS. A synonym of **Crocus** (which *see*).

CROCODILOIDES. A synonym of **Berkheya** (which *see*).

CROCOSMIA. To the species described on p. 398, Vol. I., the following varieties should be added:

C. aurea flore-pleno (double-flowered). A distinct form, with double flowers. 1893.

C. a. imperialis (imperial).* *fl.* of a brilliant fiery orange-red colour, twice as large as in the type. 1888. A grand variety.

C. a. maculata (spotted). *fl.* orange, large, having the three inner segments marked near the base with a dark reddish-brown spot. South-east Africa, 1888. (G. C. 1888, iv., pp. 407, 565, f. 80.)

CROCUS. SYN. *Crociris.* The information here given is based upon Mr. George Maw's magnificent "Monograph of the Genus *Crocus*," published in 1886. By the assistance of the following "key" to the grouping of the Crocuses in cultivation, the name of any species may be the more readily determined. The number of species described by Mr. Maw is sixty-seven: of these about seventeen are lost to cultivation, or await introduction to this country. *C. aërius*, *C. ancyrensis*, *C. Fleischeri*, *C. nevadensis*, and *C. ochroleucus* require a cold frame to bring them to perfection. *See also* pp. 398-400, Vol. I.

Division I. Involucrati.

Species with a basal spathe springing at the base of the scape from the summit of the corm.

SECTION I. FIBRO-MEMBRANACEI,

With a corm-tunic of membranous tissue, or of membranous tissue interspersed with nearly parallel fibres.

AUTUMN-FLOWERING. *asturicus, Cambessedesii, Clusii, iridiflorus, karduchorum, nudiflorus, ochroleucus, Salzmanni, Scharojani, vallicola, zonatus.*

SPRING-FLOWERING. *Imperati, Malyi, minimus, suaveolens, versicolor.*

SECTION II. RETICULATI,

With a corm-tunic of distinctly reticulated fibres.

SPRING-FLOWERING. *banaticus, corsicus, etruscus, Tommasinianus, vernus.*

AUTUMN-FLOWERING. *hadriaticus, longiflorus, medius, sativus.*

Division II. Nudiflori.

Species without a basal spathe.

SECTION I. RETICULATI,

With a corm-tunic of distinctly reticulated fibres.

AUTUMN-FLOWERING. *cancellatus.*

SPRING-FLOWERING. *ancyrensis, carpetanus, dalmaticus, gargaricus, reticulatus, Sieberi, susianus.*

SECTION II. FIBRO-MEMBRANACEI,

With a corm-tunic of membranous tissue, or of membranous tissue interspersed with nearly parallel fibres.

SPRING-FLOWERING. LILAC OR WHITE: *alatavicus, hyemalis, nevadensis.*

AUTUMN-FLOWERING. LILAC OR WHITE: *Boryi, lævigatus, Tournefortii.*

SPRING-FLOWERING. *aureus, Balansæ, Biliottii, Korolkowi, Olivieri, Suterianus, vitellinus.*

SECTION III. ANNULATI.

Basal tunic of corm separating into annuli.

SPRING-FLOWERING. *aërius, biflorus, chrysanthus, Crewei, Danfordiæ, Tauri.*

AUTUMN-FLOWERING. *pulchellus, speciosus.*

SECTION IV. INTERTEXTI.

With a corm-tunic of stranded or plaited fibres.

SPRING-FLOWERING. *Fleischeri.*

Crocus—*continued.*

C. Adami (Adam's). A variety of *C. biflorus.*

C. aërius (aërial). *fl.*, perianth tube pale lilac, 2in. long; segments bright lilac, obovate or oblong, obtuse, 1in. to 1¼in. long; throat bright yellow; proper spathe of two lanceolate, hyaline valves. Spring. *l.* but little developed at the flowering season, narrow-linear, with revolute margins and a distinct white rib down the face; basal spathe none. Corm globose, ½in. to ¾in. in diameter, the tunics brown. Asia Minor, 1835. (B. M. 6852 B; M. C. 58.)

C. algeriensis (Algeria). A synonym of *C. nevadensis.*

C. ancyrensis (Angora). *fl.*, perianth tube orange or purple, about 3in. long; throat unbearded; segments rich orange, ovate-lanceolate, ¾in. to 1in. long, ½in. broad. Spring. *l.* three or four, produced to 1ft. in length, glabrous, $\frac{1}{16}$in. broad; sheathing ones about four, ½in. to 3in. long. Corm pyriform, ¾in. broad, 1in. high. Angora, 1879. (M. C. 38.)

C. asturicus (Asturias).* *fl.*, perianth tube 4in. to 5in. long; throat violet, bearded; segments violet or purple, with a few darker lines towards the base, very variable, rarely white, 1½in. to 1¾in. long, ½in. to ¾in. broad. September to November. *l.* four or five, about 1ft. long, $\frac{1}{16}$in. broad, glabrous; sheathing ones four or five, ½in. to 2½in. long. Corm ¾in. to ¾in. broad, ½in. to ¾in. high. Asturias and Sierra de Guadarrama, North Spain. (M. C. 7.)

C. atlanticus (Atlantic). A synonym of *C. nevadensis.*

C. aureus luteus striatus (yellow, striped). *fl.* having three distinct, black stripes on the back of the outer perianth-segments. 1893.

C. Balansæ (Balansa's). *fl.*, perianth tube 2in. to 2½in. long; throat glabrous; segments orange, 1½in. long; ½in. to ¾in. broad, the outer surface of the outer ones feathered bronze or evenly suffused rich brown. March. *l.* appearing before and with the flowers, about 10in. long, $\frac{1}{16}$in. broad, ciliated on the margins of the keel and blade; sheathing ones about three, ½in. to 2½in. long. Corm pyriform, ¾in. broad and deep. Western Asia Minor. (M. C. 51.)

C. banaticus (South Hungarian).* *fl.*, perianth tube violet, 3in. long; throat white internally, unbearded; segments 1½in. long, ¾in. broad, the inner ones rich, bright purple, with darker purple markings near the summit, paler than the outer, varying to white, or variegated purple and white. March. *l.* about three, 1½ft. long, ¾in. broad, glabrous, the lateral channels wide and open; sheathing ones about four, ½in. to 3in. long. Hungary, &c. (M. C. 24.) SYN. *C. veluchensis*, of gardens (?B. M. 6197). The following are forms of this species: *albiflorus, concolor, niveus, pictus*, and *versicolor.*

C. biflorus Leichtlini (Leichtlin's). *fl.* white or pale purple, having narrow-lanceolate segments. Mardin, 1891.

C. Biliottii (A. Biliotti's). *fl.*, perianth tube about 3in. long; throat glabrous; segments rich purple, with a darker blotch at the base, about 1in. long, ½in. broad. January to March. *l.* about three, 10in. long, ¼in. broad, glabrous, the lateral channels wide and open; sheathing ones three or four, ½in. to 3in. long. Corm ½in. to ½in. broad, ½in. high. Trebizond. (M. C. 56 B.)

C. Boryi lævigatus (smooth). A synonym of *C. lævigatus.*

C. B. marathoniseus (Marathon). *fl.*, stigmas less branching than in the type, and only reaching to the level of the summit of the anthers. (M. C. 47 B, f. 4.)

C. Cambessedesii (Cambessedes'). *fl.*, perianth tube 2½in. to 3in. long; throat white internally, unbearded; segments vinous-lilac or white, ¾in. long, ½in. broad, the outer ones buff on the outside, feathered purple. September to March. *l.* two or three, 5in. to 6in. long, $\frac{1}{16}$in. broad, glabrous; sheathing ones about four, 1½in. long. Corm pyriform, about ¾in. broad and high. Balearic Islands. (M. C. 13; B. R. xxxi. 37, f. 4, under name of *C. Cambessedesianus.*)

C. cancellatus (cross-barred). *fl.*, perianth tube 4in. to 5in. long; throat yellow, unbearded; segments varying from white to light purple, self-coloured or purple-feathered, 1½in. to 1¾in. long, ½in. broad; proper spathe 12in. long. September to December. *l.* four or five, glabrous, 10in. to 12in. long, $\frac{1}{16}$in. broad, the keel prominent; sheathing ones about four, ½in. to 3in. or 4in. long. North Palestine to Armenia. (M. C. 31.)

C. c. cilicicus (Cilician). *fl.*, proper spathe shorter than in the type, completely hidden by the sheathing leaves.

C. c. Mazziaricus (Mazziari's). *fl.* white, with a bright golden-orange throat.

C. carpetanus (Toledo). *fl.*, perianth tube about 3in. long; throat white, unbearded; segments varying from delicate vinous-lilac, darker on the margins, to white, and suffused externally towards the base with bluish veins, 1in. to 1¼in. long, ¾in. broad. February to April. *l.* about four, 8in. long, $\frac{1}{16}$in. broad, semi-cylindrical, without keel or lateral channels; sheathing ones about four, ½in. to 3½in. long. Spain and Portugal, 1879. (M. C. 41.)

C. Cartwrightianus (Cartwright's). A variety of *C. sativus.*

C. chrysanthus (golden-flowered), of Herbert in B. R. xxxiii. 4, f. 1. A synonym of *C. Suterianus.*

Crocus—*continued.*

C. Clusii (Clusius'). *fl.*, perianth tube 3in. to 4in. long; throat white internally, distinctly bearded; segments light purple, darker towards the base, with no feathering, 1½in. long, ½in. broad. September to December. *l.* five or six, 9in. to 10in. long, $\frac{1}{16}$in. to $\frac{1}{12}$in. broad, glabrous, the margins bearing three prominent ridges; sheathing ones three or four, the longest 2in. to 3in. long. Corm ⅜in. to ½in. broad, about ⅜in. high. Western Spain and Portugal. (M. C. 10.)

C. corsicus (Corsican). *fl.*, perianth tube 2in. to 2½in. long; throat white or lilac inside, unbearded; segments pale purple, broadly lanceolate, about 1½in. long, ½in. broad, the outer surface of the outer ones coated buff and feathered purple. April. *l.* three or four, 8in. long, $\frac{1}{16}$in. broad, the lateral channels wide and open; sheathing ones two to four, ½in. to 2½in. long. Corm ½in. to ⅜in. broad, barely ½in. high. Corsica, 1843. (M. C. 21.) SYN. *C. insularis* (B. R. xxix. 21).

C. Crewei (Crewe's). *fl.*, perianth tube much exserted; segments white, less than 1in. long, the outer ones tinged with buff and with three to five lines of purple outside; throat yellow, glabrous; anthers dark brown. February. *l.* three or four to a tuft, as high as the flower, narrow-linear, with reflexed edges and a distinct, white, central band. Corm ovoid, ½in. in diameter; tunics rigid. Island of Sogra, 1874. (B. M. 6164; M. C. 60.)

C. dalmaticus (Dalmatian). *fl.*, perianth tube about 2in. long; throat yellow, unbearded; segments generally lilac, 1½in. long, ⅜in. to ½in. broad, the outer surface of the outer ones buff, with a few purple veins towards the base, or delicately feathered purple. February and March. *l.* three to six, 8in. to 9in. long, ⅛in. broad, glabrous, the keel convex; sheathing ones about three, ½in. to 2in. long. Corm pyriform, ½in. to ⅝in. broad and high. Dalmatia. (M. C. 34.)

C. Danfordiæ (Mrs. Danford's). *fl.*, perianth tube 2½in. long; throat unbearded; segments pale sulphur-yellow, about ⅜in. long, ⅜in. broad, the outer surface of the outer ones occasionally suffused brown. February and March. *l.* three or four, 12in. to 14in. long, $\frac{1}{16}$in. broad, ciliated on the margins of the keel and blade; sheathing ones about four, ½in. to 3in. long. Corm about ½in. broad and high. Yar-puz, Anti-Taurus, 1879. (M. C. 63.)

C. Elwesii (Elwes'). A variety of *C. sativus.*

C. estriatus (not striated). A form of *C. biflorus.*

C. etruscus (Etruscan). *fl.*, perianth tube striped lilac, 2in. to 3in. long; throat yellow; segments bright lilac-purple inside, 1in. to 1½in. long, the three outer ones having five lilac stripes down the back. March. *l.* two to six, narrow-linear, with a white, central band, the edges revolute. Corm ½in. to ⅝in. broad, rather less in height. Italy, 1877. (B. M. 6362; M. C. 22.)

C. Fleischeri (Fleischer's).* *fl.*, perianth tube about 3in. long; throat pale yellow, unbearded; segments white, linear-lanceolate, acute, 1in. to 1½in. long, barely ½in. broad, the outer surface of the outer ones and the tube veined rich purple. Early spring. *l.* four or five, 1ft. long, $\frac{1}{12}$in. to $\frac{1}{8}$in. broad, glabrous; sheathing ones about five, ½in. to 3in. or 4in. long. Corm yellow, ½in. to ⅝in. broad and high, producing bulbils or cormlets at its base. Western Asia Minor. (M. C. 66.)

C. fulvus (fulvous). A variety of *C. susianus.*

C. gargaricus (Mount Gargarus). *fl.*, perianth tube nearly 3in. long; throat unbearded; segments rich orange, unstriped, about 1½in. long, barely ½in. broad. Early spring. *l.* about three, 7in. to 8in. long, $\frac{1}{16}$in. broad, glabrous, the margins revolute, the lateral channels broad and open; sheathing ones two to four, ½in. to 2½in. long. Corm about ½in. broad, and nearly as high. Mount Gargarus. (M. C. 39.)

C. hadriaticus (Adriatic).* *fl.*, perianth tube 3in. to 4in. long; throat white or purple, bearded; segments pure white, or purple towards the base, ovate-lanceolate, 1½in. long, ⅝in. broad. October. *l.* five or six, 1½ft. long, one line broad, ciliated on the margins and keel, the lateral channels narrow, the reflected margins of the blade nearly meeting the margins of the keel; sheathing ones six or seven, ½in. to 3½in. long. Corm about 1in. broad and ⅝in. high. Albania, Ionian Islands, &c. (M. C. 30, f. 1, 2.)

C. h. chrysobelonicus (Chrysobeloni). *fl.*, throat of the perianth yellow. (M. C. 30, f. 3.)

C. Haussknechtii (Haussknecht's). A variety of *C. sativus.*

C. hyemalis (winter). *fl.*, perianth tube about 2in. long; throat yellow, unbearded; segments white, veined rich purple towards the base, about 1½in. long and ½in. broad; anthers orange. November to January. *l.* four to seven, 1½in. to 1¾in. long, ½in. broad, glabrous, the lateral channels without ridges; sheathing ones about four, ½in. to 2½in. long. Corm ½in. to ⅝in. broad and high. Palestine and Syria. (M. C. 43, f. 1-7.)

C. h. Foxii (H. Fox's). *fl.*, outer surface of the outer perianth segments freckled and suffused purple; anthers black. (M. C. 43, f. 8, 9.)

C. Imperati. The following are garden varieties: *albiflorus* (white-flowered), *atropurpureus* (dark-purple), *flore-pleno* (double-flowered), *lilacinus* (lilac), *pallidus* (pale), and *purpureus* (purple).

C. insularis (insular). A synonym of *C. corsicus.*

Crocus—*continued.*

C. karduchorum (Kurdish). *fl.*, perianth tube 2in. to 3in. long; segments vinous-lilac, 1in. to 1¼in. long, five lines broad. September and October. *l.* glabrous, dormant at the flowering time, when produced 1½in. to 2in. long, $\frac{1}{16}$in. broad, persistent till the next flowering period, when the two sets of leaves exist together; sheathing ones four or five, about 1in. long. Corm nearly spherical, ½in. to ⅝in. broad and high. Kurdistan, 1886. (M. C. 5.)

C. Korolkowi (Korolkow's). *fl.*, perianth tube brownish, 2in. long; segments bright yellow inside, oblanceolate-oblong, 1in. to 1½in. long, the three outer ones tinged with brown all over the back; spathe valves two, 1in. long. Spring. *l.* eight to twelve to a cluster, reaching to the top of the flowers, narrow-linear, with revolute margins and a distinct, white, central band down the face; basal spathe none. Corm depressed-globose, 1in. in diameter; outer tunics brown. Central Asia, 1885. (B. M. 6852 A; M. C. 56.)

C. lævigatus (smooth). *fl.*, perianth tube 3in. long; throat glabrous; segments varying from white to lilac, 1½in. to 1¾in. long, ½in. broad, the outer surface of the outer ones either self-coloured buff or more generally feathered or suffused rich purple. October to spring. *l.* four or five, appearing before the flowers, 9in. to 10in. long, $\frac{1}{16}$in. to ⅛in. broad, glabrous, the lateral channels without ridges; sheathing ones three, ½in. to 2½in. long. Corm pyriform, ⅝in. broad and high; tunic glabrous. Morea, &c. (M. C. 49.) SYN. *C. Boryi lævigatus.*

C. longiflorus (long-flowered). *fl.*, perianth tube yellow, about 4in. long; throat orange, slightly bearded; segments of a uniform, pale vinous-lilac, yellow towards the base, or externally veined or feathered purple, 1½in. long, ½in. to ⅝in. broad. October and November. *l.* about three, appearing with the flowers, 8in. to 9in. long, ⅛in. broad, the lateral channels broad and open; sheathing ones about five, ½in. to 3in. long. Corm nearly spherical, ½in. to ⅝in. in diameter. South Italy, Sicily, &c., 1843. (B. R. xxx. 3, f. 4; M. C. 28.)

C. Malyi (Maly's). *fl.*, perianth tube yellow, about 3in. long; throat orange, bearded; segments white, orange towards the throat, occasionally suffused externally with vinous-purple towards the throat, ovate-lanceolate, 1½in. to 1¾in. long. March. *l.* four or five, appearing with the flowers, 1½ft. long, ⅛in. to ¼in. broad, glabrous, the lateral channels wide and open, containing three low ridges; sheathing ones six or seven, ½in. to 4in. long. Corm oblate, ⅝in. broad, ½in. to ½in. high. Monte Vermaz. (B. M. 7590; M. C. 18.)

C. marathoniscus (Marathon). A variety of *C. Boryi.*

C. medius (intermediate). *fl.*, perianth tube 4in. to 5in. long; throat nearly white, internally veined purple, unbearded; segments bright purple, internally veined towards the base with dark purple, ovate-lanceolate, 2in. long, ⅝in. to ¾in. broad, the inner ones somewhat shorter than the outer ones. October and November. *l.* two or occasionally three, 10in. to 12in. long, $\frac{1}{16}$in. broad, the margins of keel and blade slightly ciliated, the lateral channels broad and open, containing three low ridges; sheathing ones about five, ½in. to 3in. long. Corm a little broader than high, ⅝in. in diameter under cultivation, much smaller in the wild state. Riviera, 1843. (B. R. xxxi. 37, f. 5; F. M. 20; Gn. xiv., p. 153, f. 10; M. C. 27.)

C. minimus (least). *fl.*, perianth tube 1½in. to 2in. long; throat white or lilac, unbearded; segments deep, rich purple, 1in. to 1¼in. long, ½in. broad, the outer surface of the outer ones coated buff and feathered dark purple, occasionally white or self-coloured purple. April. *l.* three or four, appearing before the flowers, 8in. to 9in. long, one line broad, glabrous; sheathing ones about three, 1in. to 2½in. long, including several scapes. Corm pyriform, fully ½in. broad and high. Corsica. An attractive little plant. (B. M. 6176; M. C. 19.)

C. minimus (least), of B. M. 2991. A synonym of *C. biflorus.*

C. mouradi (Mourad-dagh). *fl.* bright orange; style pale orange; anthers pale yellow. *l.*, sheathing ones four, the highest 5in. above the corm; proper leaves seven or eight, ½in. broad. Corm oblate, ⅝in. broad, 1in. high. Mourad-dagh, Smyrna, 1889. A vigorous grower, intermediate between *C. chrysanthus* and *C. aureus.*

C. nevadensis (Sierra Nevada). *fl.*, perianth tube 2½in. to 3in. long; throat pale yellow, bearded; segments pale lilac or white, the outer surface variously feathered or veined purple, 1in. to 1½in. long, ½in. broad. January. *l.* four or five, appearing with the flowers, 1ft. long, $\frac{1}{12}$in. to $\frac{1}{10}$in. broad, glabrous, channelled with six alternating ridges and furrows; sheathing ones about four, ⅝in. to 4in. long. Corm ⅝in. to ¾in. broad, ½in. to ⅝in. high. Spain and Algeria. (M. C. 42.) SYNS. *C. algeriensis, C. atlanticus.*

C. nubigenus (cloud-born). A form of *C. biflorus.*

C. ochroleucus (yellow and white). *fl.*, perianth tube pale buff, 3½in. long; throat orange, slightly bearded; segments pale cream-colour, suffused orange towards the base, about 1½in. long and ½in. broad. Late autumn. *l.* four to six, glabrous, appearing before the flowers, 10in. to 12in. long, nearly ½in. broad, the lateral channels wide and open; sheathing ones about six, ½in. to 2½in. long. Corm oblate, 1in. broad, ½in. high. North Palestine and Syria. (B. M. 5297; M. C. 11.)

C. Olivieri (Olivier's). *fl.*, perianth tube 1½in. to 2in. long; throat glabrous; segments bright orange, obtuse, 1in. to 1¼in.

Crocus—*continued.*

long, about ¼in. broad. Spring. *l.* three or four, appearing with the flowers, 1ft. long, ⅓in. broad, the lateral channels wide and open, the margins of the keel and blade ciliated; sheathing ones about four, ½in. to 3½in. long. Corm ½in. to ⅝in. broad and high, nearly spherical. Greece, &c. (B. M. 6031; M. C. 53.)

C. Orsinii (Orsini's). A variety of *C. sativus.*

C. Pallasii (Pallas'). A variety of *C. sativus.*

C. Salzmanni (Salzmann's).* *fl.*, perianth tube 3in. to 4in. long; throat yellowish, bearded; segments vinous-lilac, occasionally white, about 2in. long and ⅝in. broad, the outer surface of the outer ones feathered purple. Autumn. *l.* six or seven, developed before the flowers, 1ft. to 1½ft. long, about ⅓in. broad, glabrous, the keel narrow and prominent; sheathing ones three or four, ½in. to 2in. long. Corm oblate, 1in. to 1½in. broad, ⅝in. high. Tangier, Spain, &c. (B. M. 6000; M. C. 9; B. R. 4, f. 4, under name of *C. Salzmannianus.*)

C. Scharojani (Scharojan's). *fl.* orange; perianth tube 4in. to 5in. long; throat unbearded; segments lanceolate, 1½in. to 1⅝in. long, four to five lines broad, the inner ones rather shorter than the outer. July and August. *l.* three, dormant at flowering time, produced to 10in. in length, broad, glabrous, the convex keel as broad as the concave blade, the blade without the usual white band, often persistent till the ensuing flowering period; sheathing ones three or four, ½in. to 1⅝in. long. Corm small, globose or depressed-globose, ½in. broad, ⅜in. high. Circassia and Armenia. (M. C. 3; R. G. 578, f. 2, a-c.)

FIG. 279. CROCUS SPECIOSUS.

C. speciosus. Fig. 279 shows this handsome autumnal-flowering species growing in the Rock Garden at Kew.

C. suaveolens (sweetly-scented). *fl.*, perianth tube 3in. to 4in. long; throat bright orange, unbearded; segments lilac, narrow-lanceolate, acute, 1½in. long, ⅝in. broad, the outer surface of the outer ones buff, with three unbranched, purple lines. March. *l.* four or five, appearing with the flowers, 8in. to 9in. long, ⅛in. broad, the lateral channels wide and open; sheathing ones three or four, ½in. to 2½in. long. Corm oblate, ⅝in. broad, ½in. high. Rome, 1830. (B. M. 3864; M. C. 15; S. B. F. G. ser. ii. 7.)

C. susianus fulvus (fulvous). *fl.*, outer surface of the outer perianth segments suffused dull brown.

C. Suterianus (Henry Suter's). *fl.*, perianth tube 3in. long; throat unbearded; segments bright orange, fulvous towards the throat, 1in. to 1¼in. long, ½in. broad. January to March. *l.* about three, appearing with the flowers, 10in. long, $\frac{1}{16}$in. broad, the surface of the keel and margins of the blade ciliated, the lateral channels wide and open; sheathing ones about four, ½in. to 3in. long, enclosing three or four scapes. Corm pyriform, ½in. to ⅝in. broad and high. Central Asia Minor. (M. C. 52.) SYN. *C. chrysanthus* (of Herbert, in B. R. xxxiii. 4, *f.* 1).

C. Suwarrowianus (Suwarrow's). A variety of *C. vallicola.*

C. syriacus (Syrian). A form of *C. vitellinus.*

C. Tauri (Taurian). *fl.*, perianth tube scarcely exserted; segments pale purple, unstriped, 1in. to 1¼in. long; throat yellow, glabrous; anthers yellow. *l.* five or six in a tuft as high as the flowers, narrow-linear, with deflexed edges and a distinct, white, central band. Corm ⅝in. to 1in. in diameter; tunics rigid. Mountains of Cilicia and Lycia, 1892. (M. C. 61.)

C. T. melanthorus (dark-anthered). A form with black anthers. 1893.

Crocus—*continued.*

C. Tommasinianus (Tommasini's).* *fl.*, perianth tube 3in. to 3½in. long; throat white, unbearded; segments pale sapphire-lavender (said by Herbert to be occasionally marked with a darker blotch near the summit), 1in. to 1½in. long, ⅓in. to ½in. broad. March. *l.* three to five, appearing with the flowers, 9in. to 10in. long, ⅛in. broad, glabrous, the lateral channels wide and open; sheathing ones about four, ½in. to 3in. long. Corm nearly spherical, barely ½in. in diameter. Dalmatia, &c. (M. C. 25.)

C. vallicola (valley-loving). *fl.*, perianth tube buff, about 3½in. long; throat bearded; segments pale cream-colour, veined internally with five to seven purple lines, and bearing two small, orange spots towards the throat, lanceolate, 1⅜in. to 2½in. long, terminating in a fine, thread-like point; proper spathe monophyllous. August and September. *l.* four or five, 10in. to 11in. long, ⅛in. broad, glabrous, with an obscure, central, white band, the lateral channels deep; sheathing ones four to six, about 1½in. long, falling short of the proper spathe. Corm oblate, ½in. to ⅝in. broad, ⅝in. high. Caucasus, &c. (B. R. xxxiii. 16, f. 3; M. C. 2, f. 1, 4, 7, 9, 13.)

C. v. lilacinus (lilac). *fl.* much smaller than in the type; perianth segments veined with feathered, purple markings, both internally and externally. (M. C. 2, f. 6, 10, 11.)

C. v. Suwarrowianus (Suwarrow's). *fl.*, perianth throat unbearded; proper spathe diphyllous. *l.*, sheathing ones exceeding the proper spathe. September and October. (M. C. 2, f. 2, 3, 5, 8, 12, 15.)

C. veluchensis (Veluchi). A garden synonym of *C. banaticus.*

C. vernus albiflorus (white-flowered). *fl.* white, smaller than those of the type; perianth segments narrower. (M. C. 26 B, f. 6.)

C. v. leucorhynchus (white-beaked). *fl.*, perianth segments pale purple, with a deep purple flush near the white, emarginate apex. (M. C. 26 B, f. 4.)

C. v. siculus (Sicilian). *fl.* small; perianth segments whitish, with three or four purple lines on the face of each, rounded at apex. (M. C. 26 B, f. 9.)

C. vitellinus (egg-yolk-coloured). *fl.*, perianth tube pale yellow, filiform, 2in. to 3in. long; limb orange-yellow, about 1in. long, "its oblong-spathulate segments concolourous in the original *vitellinus*, striped with five feathered lines in the variety *syriacus*, and in a third form plain orange, with an obscurely lineate, brownish blotch at the base" (J. G. Baker); style much divided. November to March. *l.* five or six, glabrous, with a white, central band. Syria and Asia Minor. (B. M. 6416; M. C. 50.)

C. Weldeni (Welden's). A form of *C. biflorus.*

C. zonatus (zoned).* *fl.*, perianth tube pale buff, 2½in. to 3in. long; throat bright yellow, bearded; segments rosy-lilac, about 1½in. long, six to seven lines broad, veined internally with five to seven purple lines, and bearing on the inner surface of their base two simicircular, bright orange spots. September and October. *l.* 1ft. long, ⅛in. to $\frac{5}{16}$in. broad, with a depressed, central, white band, the lateral channels wide and open; sheathing ones five to seven, ½in. to 3in. long. Corm oblate, 1in. to 1½in. broad, ½in. to ⅝in. high. Cilician Mountains and Lebanon. (M. C. 4.)

Varieties. The following garden varieties may be recommended in addition to those found on p. 400, Vol. I.: AVALANCHE, KING OF THE BLUES, L'UNIQUE, MARGOT, NE PLUS ULTRA, QUEEN OF THE PURPLES, and WHITE PEARL.

CRŒSIA BERGMANNIANA. *See* **Rosa Insects.**

CRŒSIA HOLMIANA. *See* **Pear Insects.**

CRŒSUS SEPTENTRIONALIS. *See* **Nut Sawfly.**

CRONARTIUM RIBICOLUM. *See* **Bladder Rust.**

CROPS AND CROPPING. The advantage of annually changing Crops in the kitchen garden is manifested by a healthy and cleanly growth. With a few exceptions it will be found that a Crop following a Crop of similar character is not profitable. Leguminous Crops absorb nitrogen from the atmosphere, and the land occupied by them is suitable for Onions, &c., that enjoy such an element of plant-food. A good rule is to grow bulbous or tuberous-rooted vegetables after Crops that are not of that nature; deep-rooted plants, like Beet, Parsnips, and Carrots, could follow Celery. Broccoli, Kale, Cabbage, Cauliflower, and Brussels Sprouts should not follow each other, as they absorb much the same constituents from the soil. Mixed Cropping, such as Cauliflowers, Brussels Sprouts, Savoys, &c., ought not to be planted between Potato rows, as one Crop spoils the other. Another advantage of an interchange of Crops is that by its means many fungoid diseases are kept at bay.

CROSNES (*Stachys tuberifera*). This belongs to the genus *Stachys*; but, owing to the apparent impossibility of getting it to flower, botanists have not been able to decide on its specific name; it therefore goes by the provisional one of *tuberifera*. By the French it is known as Crosnes du Japon, and over here it has been dubbed Stachys, Spirals, and Japanese or Chinese Artichokes. The roots of this vegetable are very curious-looking (see Fig. 280), quite white, and deeply corrugated in segments, giving them very much the appearance of the larva of some insect—indeed, not at all unlike the larva of the queen-bee. The foliage of the plant is small and not at all ungraceful, and the roots are produced somewhat in the way of some *Oxalis*, in long strings and in considerable abundance.

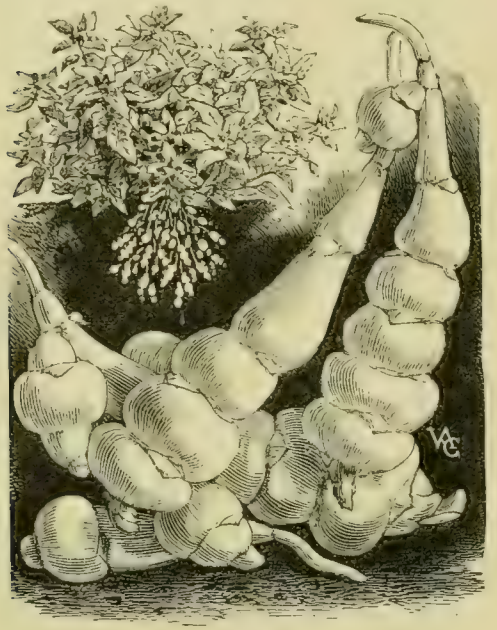

FIG. 280. CROSNES.

It should be planted in rows in any ordinary garden soil in March, the rows being about 12in. apart, and two of the roots dibbled in at about 6in. apart. With the exception of weeding, no further cultivation is required. Crosnes are perfectly hardy, and should be left in the ground, digging them up as required, as they become dark when much exposed to the air.

CROSSANDRA. To the species described on pp. 400-1, Vol. I., the following should be added:

C. flava (yellow). *fl.* yellow, disposed in a terminal, tetragonal, cone-like spike; outer bracts large, rounded, very hairy, spiny-toothed. January. *l.* glabrous, obovate-lanceolate, undulated, sinuate-pinnatifid, entire towards the apex; lower ones petiolate. Stem short, highly glabrous. Sierra Leone, 1852. (B. M. 4710.)

CROSS-FERTILISATION. *See* **Hybridising.**

CROSSYNE. Included under **Buphane** (which *see*).

CROTALARIA. To the species described on p. 402, Vol. I., the following should be added. Few of the large number introduced are now in cultivation.

C. arborescens (tree-like). A synonym of *C. capensis.*

C. benghalensis (Bengalese). A synonym of *C. juncea.*

C. capensis (Cape). *fl.* bright yellow, 1in. long, on longish pedicels; racemes terminal or opposite the leaves, lax, many-flowered. *l.*, leaflets broadly obovate, ⅜in. to 1in. long, obtuse, emarginate, acute, or mucronate; petioles ½in. to 1½in. long. *h.* 4ft. to 5ft. South Africa, 1774. A stout, greenhouse shrub. SYN. *C. arborescens.*

C. elegans (elegant). A garden name for *C. purpurea.*

C. fenestrata (window-like). A synonym of *C. juncea.*

Crotalaria—*continued.*

C. floribunda (abundant-flowered). A synonym of *Viborgia obcordata.*

C. juncea (Rush-like). *fl.* yellow; racemes loosely ten- to twenty-flowered, 1ft. long, lateral and terminal. September. *l.* rather distant, firm, linear or oblong, 1½in. to 3in. long. Branches slender, twiggy, terete. *h.* several feet. India, 1816. Stove shrub. SYNS. *C. benghalensis, C. fenestrata* (B. M. 1933).

C. longirostrata (long-beaked).* *fl.* rich yellow, with a red stripe at back; standard large, broader than long; claw ciliated; raceme erect, many-flowered. December to March. *l.* trifoliolate; leaflets oblong- or cuneate-obovate, mucronulate at apex. Mexico, 1891. A very handsome, greenhouse sub-shrub. (B. M. 7305.)

C. pulchella (pretty). A synonym of *Lebeckia cytisoides.*

C. purpurea (purple). *fl.* bright purple, ½in. long; racemes terminal, many-flowered, elongating. March to May. *l.*, leaflets ⅜in. to 1in. long, ¼in. to ½in. broad, elliptic or obovate, often drying bluish or livid, as if they contained indigo. *h.* 3ft. to 4ft. South Africa, 1790. A highly ornamental, much-branched, greenhouse shrub. (B. M. 1913.) SYN. *C. elegans* (of gardens).

C. semperflorens (ever-flowering). *fl.* bright yellow, ½in. to ⅝in. long; racemes lateral and terminal, not panicled. Spring. *l.* oblong, rounded at base, acute or obtuse, 2in. to 4in. long, green and glabrous above, pale and downy beneath; stipules leaf-like. Branches terete. India, &c. 1816. Greenhouse shrub.

CROTON BUG OF AMERICA. This is the name applied to a most destructive species of Cockroach, abundant in America and elsewhere, and known scientifically as *Phyllodromia germanica.*

CROWN. *See* **Corona.**

CROWN BEARD. *See* **Verbesina.**

CRUCIANELLA. About twenty-six species, natives of the Mediterranean region and Western Asia, are included in this genus. To those described on p. 402, Vol. I., the following should be added:

C. angustifolia (narrow-leaved). *fl.* whitish, spicate, four-parted; corolla slender; spike linear, quadrifarious, imbricated, somewhat interrupted at base. June and July. *l.* in whorls of six, linear, acute, scabrous on the margins. Plant erect. *h.* 6in. to 8in. Asia Minor, 1816. Annual. (S. E. B. 109.)

C. stylosa (prominent-styled). A synonym of *Phuopsis stylosa.*

CRUIKSHANKSIA (of Hooker). A synonym of **Balbisia** (which *see*).

CRUSEA (named in honour of Dr. G. Cruse, an authority on the Cape *Rubiaceæ*). ORD. *Rubiaceæ.* A genus embracing about ten species of stove, erect or ascending herbs, natives of Mexico and Central America. Flowers pink, mediocre, in a head with four involucral bracts. Leaves opposite, ovate or lanceolate, nerved. *C. rubra* (B. M. 1558, under name of *Spermacoce strigosa*) has been introduced, but is perhaps not now in cultivation.

CRYOSOPHILA, or **CRYSOPHILA.** Included under **Copernicia** (which *see*).

CRYPTANTHUS. SYN. *Pholidophyllum.* According to J. G. Baker, this genus now embraces about a dozen species, natives of Brazil and Guiana. Flowers white, arranged in a head in the axils of the inner leaves; sepals united in a campanulate tube just above the ovary, the segments not mucronate; petals three or four times as long as the calyx, widely spreading; stamens inserted on the corolla; anthers small. Leaves many in a rosette, spreading, with stolons in the axils of the outer ones. Only a few of the species are in cultivation. To those described on p. 402, Vol. I., the following should be added:

C. Beuckeri (Beucker's). *fl.* white, in a small head. *l.* disposed in an open rosette, petiolate, elliptic, acute or acuminate, light reddish, with numerous transverse, green, irregular lines or blotches, the margins spinulose. South Brazil, 1883. A remarkable, dwarf Bromeliad. (B. H. 1881, p. 342, t. 1.)

C. Morrenianus (Morren's). A synonym of *Distiacanthus Morrenianus.*

C. undulatus (wavy). The correct name of *C. acaulis.* The form *purpureus* (Ref. B. 237) has leaves tinged with reddish-brown.

C. zonatus (zoned). *fl.* in a small tuft in the centre of the rosette; petals white, oblanceolate, 1in. long. *l.* ten to fifteen in a short rosette, oblong-lanceolate, 6in. to 9in. long, 1½in. broad, thinly white-lepidote on the back, with small and close marginal prickles. Brazil, 1842. SYNS. *Pholidophyllum zonatum, Tillandsia zonata* and *T. zebrina* (of gardens).

C. z. fuscus (dark). *l.* brown instead of green.

CRYPTARRHENA (from *kryptos*, hidden, and *arrhen*, a male; in reference to the concealed anthers). SYNS. *Clynhymenia*, *Orchidofunckia*. ORD. *Orchideæ*. A genus embracing only a couple of species of stove, epiphytal Orchids, with small, greenish-yellow flowers; one is found in the West Indies and West and Central America, and the other in Surinam. *C. lunata* (B. R. 153) is in cultivation at Kew, but is of little horticultural interest.

CRYPTOCAMPUS ANGUSTUS. *See* **Salix.**

CRYPTOCARPUS (from *kryptos*, hidden, and *karpos*, fruit; the fruit is included within the connivent calyx). ORD. *Nyctagineæ*. A small genus (two species) of slightly fleshy, prostrate or somewhat climbing, stove or greenhouse shrubs; one is found on the Mexican mountains, and the other on the sea-coasts of tropical South America. Flowers small, cymose, hermaphrodite. Leaves alternate, exstipulate, entire. *C. globosus* (SYN. *Salpianthus purpurascens*) has been introduced, but is probably not now in cultivation.

CRYPTOCHILUS. Both species are natives of the Himalayas. Flowers closely set, in distichous spikes, shorter than their persistent bracts; sepals connate in an equally three-lobed, gibbous, five-toothed tube; petals narrow; lip included, adnate to the foot of the column, narrow, erect; pollinia eight. Pseudo-bulbs crowded, one- or two-leaved. To the species described on p. 402, Vol. I., the following should be added:

Cryptochilus—*continued.*

C. lutea (yellow). *fl.* pale yellow, sub-globose; sepals obtuse; petals and lip lanceolate; spike 2in. to 4in. long; scape 2in. to 4in. long, rather slender. Leaves one or two, 3in. to 5in. long, linear-lanceolate, acute, petiolate or nearly sessile. Pseudo-bulbs oblong. 1882.

CRYPTOCORYNE. SYN. *Myrioblastus*. This genus embraces about twenty-five species, natives of tropical Asia and the Malayan Archipelago. Flowers on a very slender spadix, the males and females very distant; spathe tube short or elongated, the lamina straight, folded or twisted. Leaves oblong- or linear-lanceolate or ovate.

FIG. 231. CRYPTOMERIA JAPONICA.

CRYPTOGAM, CRYPTOGAMIA. A Cryptogam is a plant of the class *Cryptogamia*, which is the last class in the Linnean Sexual System, and comprises those plants having no stamens or pistils, and therefore no proper flowers; it includes Ferns, Mosses, Algæ, Lichens, and Fungi.

CRYPTOGLOTTIS. A synonym of **Podochilus** (which *see*).

CRYPTOGRAMME. The Mountain Parsley Fern is essentially a deciduous plant, losing its fronds about the end of October and starting into growth again about the beginning of May. Its fertile fronds, considerably longer than the others, and produced as a second crop of foliage later in the season, are greatly appreciated for bouquets and button-holes. Their spores ripen and scatter themselves, in their native state, about September, after which the fronds soon die down, the barren ones remaining on the plants rather longer than the others.

Although usually found growing wild in exposed situations, the Mountain Parsley Fern delights in a cool, moist, and shady spot, and is especially adapted for a quiet nook in a rockery, where it should be planted in a well-drained place and in a mixture of loam and peat in about equal parts, with the addition of bricks broken into small pieces; but care should be taken that the compost is free from lime, which is highly injurious to the very minute fibrous rootlets. It may be propagated by seedlings, but this is a slow and tedious process; the more so that it is readily increased by the division of the crowns in the spring months, just before growth commences. This little gem also grows luxuriantly in a cold frame, or for two or three years in the greenhouse, or under the shade of vines, where, however, it seldom lasts any longer. The plants should always be well established in pots before being turned out into the border or on the rockery.

CRYPTOLOBUS. The species formerly classed under this name are now referred to **Amphicarpæa** and **Voandzeia** (which *see*).

CRYPTOMERIA. This genus is monotypic, *C. elegans* being a variety of *C. japonica*, which is well shown in Fig. 281. To the varieties described on p. 404, Vol. I., the following should be added:

C. japonica araucaroides (Araucaria-like). *l.* dark bluish-green, thickly disposed, but regularly arranged, imparting a very dense appearance. Japan, 1885. SYN. *C. j. lycopodioides.*

C. j. compacta (compact). This forms a compact, regular pyramid. Japan, 1885.

C. j. lycopodioides (Lycopod-like). A synonym of *C. j. araucaroides.*

C. j. Sandersii (Sanders'). A variety of dense habit.

Other varieties are *nigricans*, *pungens*, and *rubiginosa.*

CRYPTOPHORANTHUS (from *kryptos*, hidden, *phoreo*, to bear, and *anthos*, a blossom; in allusion to the petals, lip, &c., being concealed within an almost closed flower, the only opening into which is by a pair of small "windows" at the side). Window-bearing Orchid. ORD. *Orchideæ*. A curious genus, with the habit of *Pleurothallis* (section *Aggregatæ*), but differing from that genus in the sepals being united into a short tube at the base and again united at the apex—the only way into the flower being by the small, window-like openings, one on either side. From *Masdevallia* the genus differs in habit, as also in the characters just given. Eight species are known; they are stove Orchids, ranging over an area from the West Indies to the Andes and Brazil. The following species are now included here, the specific names remaining unchanged: *Masdevallia Dayana*, *M. gracilenta*, *M. hypodiscus*, and *Pleurothallis atropurpurea*. For culture, *see* **Pleurothallis.**

C. maculatus (spotted). *fl.* yellow, densely spotted crimson, numerous, ¼in. long, obovoid, obtuse, pubescent, situated at the base of the leaf on the very short stem (so short that the flowers actually lie on the soil). *l.* elliptic, obtuse, very fleshy, with numerous purple spots or small blotches on the upper surface, 1¼in. to 2¼in. long, ⅜in. to 1¼in. broad, the apex minutely tridenticulate. Probably Brazilian. A remarkable little plant. SYN. *Pleurothallis maculata.*

C. minutus (minute). *fl.* deep maroon-purple, large for the size of the plant. *l.* orbicular, apiculate, five lines long. Stems very short or wanting. *h.* not much exceeding ¼in. Habitat unknown, 1895. A very minute species.

C. oblongifolius (oblong-leaved). *fl.* dull yellow, veined with maroon-purple, pendulous; sepals nearly or quite 1in. long; petals ¼in. long; peduncles ⅜in. long, erect. *l.* elliptic-oblong, 1½in. to 3in. long. Stems terete, 1½in. to 2in. long, tubular-infundibular. Andes of South America, 1895.

C. sarcophyllus is in the Kew Collection, but is not in general cultivation.

CRYPTOSACCUS. A synonym of **Leiochilus** (which *see*).

CRYPTOSANUS. A synonym of **Leiochilus** (which *see*).

CRYPTOSTACHYS. A synonym of **Sporobolus** (which *see*).

CRYPTOSTEMMA. SYN. *Cynotis. Microstephium* is included in this genus.

CRYPTOSTYLIS (from *kryptos*, hidden, and *stylos*, a pillar, a style; in allusion to the concealed style). The generic description is given in the body of this work under Blume's name, **Zosterostylis** (which *see*).

C. longifolia (long-leaved). *fl.* three to eight, rather distant, upwards of 1in. broad; sepals yellowish-green, narrow; petals the same colour, shorter; lip red, with reddish-brown markings, pointing upwards, the short style hidden in the cucullate base (hence the generic name). *l.* solitary, lanceolate, on long stalks. *h.* 1ft. to 2ft. Tasmania, 1885. Greenhouse. (G. C. n. s., xxiii., p. 275, f. 53.)

CRYSOPHILA, or **CRYOSOPHILA.** Included under **Copernicia** (which *see*).

CUBÆA. A synonym of **Tachigalia** (which *see*).

CUBAN LILY. *See* **Scilla peruviana.**

CUBEBA. Included under **Piper** (which *see*).

CUCIFERA. A synonym of **Hyphæne** (which *see*).

CUCUBALUS (altered from *Cacobolus*, which is derived from *kakos*, bad, and *bolus*, a shoot; in allusion to the plant being destructive to the soil). ORD. *Caryophylleæ*. A monotypic genus. The species, *A. baccifer*, is a diffuse, climbing, hardy herb, native of Europe and Asia; it is of no horticultural value. Many plants formerly included hereunder are now referred to **Silene.**

CUCULLARIA. A synonym of **Vochysia** (which *see*).

CUCUMBER. *Sorts:* Improved Telegraph, Lockie's Perfection, Purley Park Hero, Cardiff Castle, Monarch, and All the Year Round, which last is one of the very best to grow in the winter. If very long Cucumbers are desired, Marquis of Lorne and Daniels' Duke of Edinburgh will prove satisfactory, both varieties growing some 30in., and of good form. For outside cultivation in summer, the Ridge varieties are the only sorts suitable, the best being Bedfordshire Surprise, Long Prickly, Short Prickly, and Stockwood.

CUCUMBER, BITTER. *See* **Citrullus Colocynthis.**

CUCUMBER-TREE. In addition to the species mentioned on p. 406, Vol. I., this name is applied to **Averrhoa Bilimbi** (which *see*).

CUCUMIS. This genus embraces about twenty-five species, mostly found in tropical Africa and Asia, a few being indigenous in Australia and America. To those described on pp. 406-7, Vol. I., the following should be added:

C. Chate (Chate). A form of *C. Melo.*

C. Dudaim (Dudaim). Canary Melon; Scented Cucumber. *fr.* orange-yellow, spotted or barred with red at maturity, spherical or ovoid, edible, having an agreeable odour. August to October. Persia. This is a form of *C. Melo.* (F. d. S. 1474.)

C. flexuosus (bending). A form of *C. Melo.*

C. Melo Chate (Chate). Egyptian Cucumber. *fl.* small, shortly pedunculate. *fr.* elliptic, attenuated to both base and apex, pilose. *l.* petiolate, rounded, obtuse, denticulate. Stem obtusely five-angled. Native country uncertain. Plant very villous.

C. M. flexuosus (bending). *fl.* fascicled in the axils; calyx very pilose. *fr.* white or yellow, elongated, cylindrical-club-shaped, sulcate, flexuous. *l.* cordate-ovate, somewhat lobed, petiolate. Stem flexuous, bearing tendrils. East Indies (?).

C. Sacleuxii (Sacleux'). *fr.* dark green, with lighter green stripes, ovoid, 3in. to 4in. long. *l.* roundish-reniform, lobed, rough and greyish-green on both sides. Zanzibar, 1890. An ornamental stove Cucumber, the fruits of which can be used for pickling.

C. Vilmorini (Vilmorin's). *fr.* canary-yellow, armed with soft spines, produced in great abundance. *l.* cut. Origin not recorded, 1894.

CUCURBITA. Pompion. The half-dozen species of this genus are distributed over the warmer parts of Asia, Africa, and America. To the species and varieties described on pp. 407-8, Vol. I., the following should be added:

C. Andreana (André's). *fl.* about half as large as those of the common Pumpkin (*C. Pepo*). *fr.* marked with white and yellow on a green ground, obovoid. *l.* large, marbled with white. Stems long, rooting at the nodes. Uruguay, 1890. Greenhouse. (R. H. 1896, p. 8, f. 1.)

C. ficifolia (Ficus-leaved). A very curious species, with round fruits somewhat resembling a Water-Melon, and climbing stems; it is very useful for large trellises. SYN. *C. melanosperma.*

C. f. mexicana (Mexican). This variety has seeds twice the size of those of the type. Mexico, 1890. Half-hardy.

C. maxima sylvestris (sylvan). *fr.* as large as a man's head. This is "supposed to be the origin of all the large-fruited Gourds in cultivation. The native country of *C. maxima* was unknown, but the present plant has been found wild in the Himalayan region." 1893. (Kew Bulletin, 1894, App. II.)

C. melanosperma (dark-seeded). A synonym of *C. ficifolia.*

C. mexicana (Mexican). A variety of *C. ficifolia.*

CUDRANIA (from the Malayan name, *Cudrang*, given to a green dye yielded by this tree). SYN. *Cudranus.* ORD. *Urticaceæ*. A small genus (three or four species) of stove, greenhouse, or hardy shrubs or small trees, usually spinous, erect or climbing, natives of Asia, Australia, and New Caledonia. Flowers dicœcious, in small, naked, globose heads. Leaves alternate, quite entire, penniveined; stipules lateral, small. For culture of the only species introduced, *see* **Morus.**

C. triloba (three-lobed). The correct name of *Maclura tricuspidata.*

CUDRANUS. A synonym of **Cudrania** (which *see*).

CULCASIA. Six or eight species, all tropical American, are comprised in this genus. Spathe small, erect; peduncles axillary, solitary, or several and fastigiate. Leaves spirally inserted.

CULEN. *See* **Psoralea glandulosa.**

CULLUMBINE, or **COLUMBINE.** *See* **Aquilegia.**

CULLUMIA (named in honour of Sir T. G. Cullum, Bart., a Norfolk botanist). ORD. *Compositæ*. A genus embracing about fourteen species of greenhouse, small shrubs or under-shrubs, all South African, allied to *Gazania*. Flower-heads yellow, terminal, solitary. Leaves alternate, sessile or decurrent, margined with cilia. *C. ciliaris* (B. M. 2095; B. R. 384) and *C. pectinata* have been introduced, but are probably not now in cultivation.

CUNCEA. A synonym of **Knoxia** (which *see*).

CUNDURANGO. *See* **Marsdenia Cundurango.**

CUNINA. A synonym of **Nertera** (which *see*).

CUNNINGHAMIA. SYNS. *Belis, Raxopitys.* This tree, which is also found in Japan, is closely allied to *Araucaria.*

CUNONIA (of Miller). A synonym of **Antholyza** (which *see*).

CUNONIEÆ. A tribe of **Saxifrageæ** (which *see*).

CUP (p. 409, Vol. I.). This term is also botanically applied to a concave involucre enclosing a nut, as in the Acorn. *See* **Cupula.**

CUPAMENI. A synonym of **Acalypha** (which *see*).

CUPANIA. This is a rather large, tropical genus, widely distributed. To the species described on p. 409, Vol. I., the following should be added:

C. Cunninghamii (Cunningham's). A synonym of *Diploglottis Cunninghamii.*

C. elegans (elegant). This is described as "a species with light and graceful leaves, undulated and toothed at the edges." Habitat not recorded, 1893.

C. grandidens (large-toothed). *l.* impari-pinnate; leaflets nine, oblong, acuminate, sinuately lobed, 3in. to 4in. long. Stems downy. Zanzibar, 1884.

CUPHEA. Including *Melvilla.* About ninety species, natives of tropical and subtropical America, are included in this genus. To those described on p. 409, Vol. I., the following should be added:

C. Commersoniana (Commerson's). *fl.*, calyx thick and, as well as the pedicels, glandular-hairy, the dorsal lobe broader than the rest; petals obovate. *l.* sub-sessile, cuneate, ovate-lanceolate, or narrow-lanceolate. Stems 6in. to 18in. long, woody below. Brazil, 1834.

C. cordata (heart-shaped). *fl.* scarlet; calyx and peduncle glutinous; petals six, the two upper ones large and nearly round, the four lower ones small. June. *l.*, lower ones cordate, acute, sub-coriaceous; upper ones oblong. Stems sub-shrubby; branchlets glutinous. *h.* 1½ft. Peru, 1842. Evergreen. (B. M. 4203; F. d. S. ii. 7.)

C. eminens (conspicuous). A synonym of *C. micropetala.*

C. ignea alba (white). A variety with white flowers. 1843.

C. Llavea (Llavea). *fl.* purple, with two large, obovate petals (the rest abortive); pedicels erect. June. *l.* sub-sessile, ovate-lanceolate, strigose. Stems numerous, hispid. Mountains of Mexico. 1830 and 1891. (B. R. 1386.)

C. Llayæ. A misprint in several publications for *C. Llavea.*

C. micropetala (small-petaled). *fl.* supra-axillary, secund; calyx scarlet, yellowish at apex, twelve-toothed; petals white; filaments red. July. *l.* oblong-lanceolate, acute at both ends, rigid, scabrous. Stems shrubby, much-branched. *h.* 1ft. Mexico, 1824.

C. pubiflora (downy-flowered). A synonym of *C. cyanea.*

C. strigulosa (slightly strigose). *fl.* violet, interpetiolar, alternate; petals six, sub-equal; stamens eleven. June to October. *l.* ovate-oblong, acute, viscous, glabrous above, scabrous-strigose beneath. Branches and calyx viscid-hispidulous. *h.* 1½ft. Andes. Shrub. (P. M. B. xi. 241.)

C. verticillata (whorled). *fl.* violet, solitary or in pairs, alternate, extra-axillary; calyx pilose-hairy, ten- to sixteen-toothed, coloured; petals five to eight, unequal. *l.* three or four in a whorl, sub-sessile, oblong, slightly acute, somewhat rounded at base, scabrous-strigulose above, pilose beneath. Branches pilose-hairy. Peru. Stove perennial. (F. d. S. vi. 510.)

CUPIA. This is for the most part synonymous with **Randia** (which *see*).

CUPRESPINNATA. A synonym of **Taxodium** (which *see*).

CUPRESSTELLATA. A synonym of **Fitzroya** (which *see*).

CUPRESSUS. About a dozen distinct species, natives of temperate Asia, South-eastern Europe, North America, and Mexico, are included in this genus, according to the authors of the "Genera Plantarum." To those described on pp. 409-10, Vol. I., the following should be added. *See also* **Chamæcyparis.**

C. arizonica (Arizona). A variety of *C. Benthami.*

C. Benthami (Bentham's). *l.* opposite, ovate, acute, imbricated, keel-shaped at back, with a hollow band in the centre, and, as well as the branchlets, dark green and glaucous when young. *cones* globular, nearly ¾in. in diameter. Branches dense, flat, spreading; branchlets four-sided, slender, mostly curved and forked. *h.* 50ft. to 60ft. Mountains of Mexico and Guatemala

FIG. 282. CUPRESSUS LAWSONIANA.

Half-hardy. SYN. *C. thurifera. C. arizonica* is a variety of this species.

C. Goveniana compacta (compact). A variety differing from the type in its dense, compact, pyramidal habit. 1896. (R. H. 1896, p. 8, f. 1.)

C. guadelupensis (Guadeloupe). A variety of *C. macrocarpa.*

C. Hartwegii is synonymous with *C. macrocarpa.*

C. Lawsoniana (Lawson's). The correct name of *Chamæcyparis Lawsoniana*, according to Dr. Masters. See Fig. 282.

C. Lindleii (Lindley's). The correct name of *C. Knightiana.*

C. macrocarpa Crippsii (Cripps'). *l.* small, open, erecto-patent, rigid, very acute, spiny-pointed, silvery when young. Branches stout, stiff, short, very compact; branchlets dense, silvery-tipped when young. A fine variety.

Cupressus—*continued.*

C. m. fastigiata (pyramidal). A variety of pyramidal habit.

C. m. flagelliformis (whip-like). Branchlets light glaucous-green, long, less divided than in the type.

C. m. guadeloupensis (Guadeloupe). This variety differs from the type principally in the glaucous colour of its leaves. 1895.

C. m. lutea (yellow). *l.* suffused with pale golden-yellow, very small. Branches short. 1893. An elegant, erect variety.

C. m. variegata (variegated). Branchlets partly golden.

C. sempervirens. Other varieties are: *fastigiata* (pyramidal), *flagelliformis* (whip-like), *monstrosa* (a tall variety), *retrofracta* (bent back), *thuiæfolia* (Thuya-leaved), and *variegata* (variegated).

C. thurifera (Frankincense-bearing). A synonym of *C. Benthami.*

C. Thyoides (Thuya-like). A synonym of *Chamæcyparis sphæroidea.*

C. torulosa majestica (majestic). A hardier and much more robust plant than the type, being larger in all its parts.

CURCULIGO. SYNS. *Empodium, Fabricia* (of Thunberg), *Forbesia.* This genus comprises about a dozen species of stove perennials, natives of tropical Asia, Australia, tropical and South Africa, and tropical America. Flowers spicate or racemose; perianth six-parted, the segments sub-equal, spreading; stamens six, affixed at the base of the segments; whole inflorescence frequently villous. Fruit more or less succulent. Leaves radical, often long-lanceolate, plicate-veined, sometimes very large. To the species and varieties described on p. 410, Vol. I., the following should be added:

C. densa (dense). *l.* oblong-ovate, acute, plicate, dark green, with a silvery lustre. India, 1885. A pretty, decorative plant, of dwarf habit.

CURCUMA. SYNS. *Erndlia, Stissera.* The species extend from tropical America to tropical Australia and the South Pacific Islands. To those described on p. 411, Vol. I., the following should be added:

C. Amada (Amada). *fl.* about 1in. long; corolla whitish, the lip pale yellow; spikes 3in. to 6in. long; bracts about 1in. long. Autumn. *l.* oblong-lanceolate, 1ft. to 1½ft. long; petioles as long as the blades; leafy tuft 2ft. to 3ft. across. Rootstock large, ovoid. India, &c., 1819.

C. aromatica (aromatic). *fl.* yellow, shorter than the bracts; corolla tube 1in. long; spike (with peduncle) 1ft. long; bracts ovate, pale green, 1½in. to 2in. long. April to June. *l.* 3ft. to 4ft. long, oblong, caudate, deltoid at base, plain or variegated with light and darker green above, pubescent beneath. Rootstock biennial; tubers sessile, aromatic. India, 1804.

C. Bakeriana (Baker's). *fl.* orange-coloured, somewhat larger than in *C. australasica* (which this species resembles); corolla-lobes ovate-oblong, shorter than the lip; spike scarcely 3in. long; bracts pale rose. *l.* distichous, oblong-lanceolate. Tuber 3in. to 3½in. long. *h.* 2ft. Islands near New Guinea, 1892.

C. cordata is identical with *C. petiolata.*

C. ferruginea (rusty). *fl.* red, few, large; fertile bracts tinged with reddish-brown, those of the coma few, bright red. Spring. *l.* oblong, 1ft. to 1½ft. long, 5in. to 6in. broad, with a faint reddish-brown cloud down the centre. Rootstock large; tubers sessile, yellow, very fragrant inside. India, 1819.

C. latifolia (broad-leaved). *fl.* pale yellow, rather shorter than the bracts; spike 6in. to 8in. long; bracts green, ovate, 1½in. long, those of the coma bright red. Spring. *l.* oblong, 3ft. to 4ft. long, clouded with purple down the middle, pubescent beneath. Rootstock large. India, 1820.

C. Leopoldi (Leopold's). *l.* lanceolate, pale green, striped with creamy-white. 1884. An attractive plant, of distinct character, growing in clumps, and resembling a Musa in habit.

C. neilgherrensis (Neilgherries). *fl.* bright yellow, 1in. long; lip deflexed, emarginate; spikes 2in. to 4in. long; bracts pale yellowish-green, 1in. to 1½in. long. Spring. *l.* lanceolate, pale green, 1ft. long including the short petiole. Malabar, &c. Plant dwarf.

C. rubescens (reddish). The correct name of *C. rubricaulis.*

CURD. A gardener's name for the head of a Cauliflower or Broccolo.

CURL BRUSH BEAN. *See* **Pithecolobium.**

CURLED. *See* **Crisp.**

CURRANT APHIDES (*Myzus Ribis* and *Rhopalosiphum ribis*). *See* **Aphides.**

CURRANT-BUD MITE (*Phytoptus ribis*), or Black Currant Gall Mite, is responsible for the condition of the bushes known as "Big Bud." It has hitherto baffled all the most experienced entomologists to cope with its attacks.

Currant-Bud Mite—*continued.*

Black Currants only are infested, and the terminal buds are usually oftenest selected. Once the creatures are inside they cause (by the irritation set up) the buds to swell abnormally (see Fig. 283), and such buds may easily be detected in late autumn. Here again insecticides are of very little avail, and hand-picking the galled buds is the most practical remedy. Still, if the trees could be sprayed during July with Kerosene Emulsion, some good might be done.

FIG. 283. CURRANT SHOOT, SHOWING ABNORMAL BUDS DUE TO CURRANT-BUD MITE.

CURRANT CLEAR-WING MOTH or **CURRANT BORER** (*Sesia tipuliformis*). On account of the absence of scales from the wings this insect (Fig. 284) is seldom taken for a Moth. Under this heading in Vol. I., as well as under **Sesia** (Vol. III.), both the perfect insect and its destructive caterpillar have been described. It is one of those pests against which the cultivator is almost powerless. In fact, the only thing to be done is to remove all dead and dying shoots and burn them.

CURRANTS. Nearly all the pests infesting the foliage may be easily eradicated with carbolic soft soap. Dissolve 2oz. in each gallon of hot water, and spray both sides of the foliage with the liquid warm. The application of such insecticides warm is most important, as the effect is far more deadly, and usually means all the difference between success and failure in coping with these foes. A far more difficult enemy to combat is the Currant-Bud Mite (*Phytoptus ribis*), dealt with under that heading.

Varieties. To the list given in Vol. I. the following should be added:

Black. CARTER'S CHAMPION, very large and deep black; the bunches are also large; a fine variety for exhibition, or for dessert.

Red. COMET, very large in bunch and berry, and of the brightest red; a great cropper; but there is a doubt about this being distinct from LA VERSAILLES. LA CONSTANTE, a large deep red, with good bunches, which are freely produced; valuable for its lateness and the time the fruit will hang on the bushes. LA VERSAILLES, a large and nice-flavoured variety, with good cropping qualities, but not a good grower in all gardens.

White. WHITE DUTCH CUT-LEAVED, bunches and berries of the largest size, of sweet and good flavour; an abundant bearer.

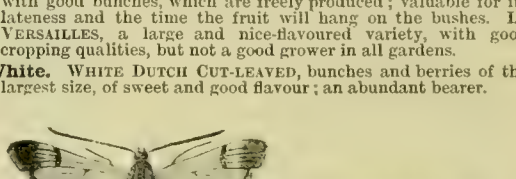

FIG. 284. CURRANT CLEAR-WING MOTH.—PERFECT INSECT AND CATERPILLAR (both magnified.)

CURRANT SCALE (*Pulvinaria ribesiæ*). Of late years Currant bushes in many parts of England have been attacked by this distinctive species of Scale, which has probably been introduced from the Continent, where it is abundant, especially in France. Its chief characteristic is an exudation of white, cottony matter, which contains the eggs and the newly-hatched Scales. The pest cannot be

Currant Scale—*continued.*

taken for anything else, and it would therefore serve no purpose to describe the Scale itself. This insect affects all varieties of Currants, and its presence is most undesirable. Remedial measures should be taken as soon as possible, weak Kerosene Emulsion being one of the best insecticides to spray on for Scale of any kind.

CURRANT-SHOOT MOTH (*Incurvaria capitella*). This is another of the small Moths (*Tineæ*) whose larvæ injure fruit and other crops. As the common name indicates, the Currants in the present case are laid under contribution, though so far no one has found the pests upon the White varieties. At one time it was thought that only Red Currants were infested, but of recent years entomologists have found the minute caterpillars in large numbers on Black Currant bushes. The species under notice is a very near relative of the Moth *Lampronia rubiella*, found upon the Raspberries. The first indication that the bushes are infested is shown towards the end of spring, and consists in a withering of the young shoots, caused by the persistent attacks of the larvæ on the pith. If such shoots are removed, it will be found that they contain the larvæ of this minute Moth.

The perfect insects are on the wing at the latter part of May. They are very small (about ⅛in. in wing expanse), and therefore readily escape notice. They are brownish, and usually have a purplish sheen, the somewhat sombre colouring being relieved by a pale yellow marking on each wing near the inner margin, and beyond are two conspicuous yellow spots. The hind-wings are greyish. Having paired, the female seeks a place to deposit her eggs. This she does within the fruits, these being pierced by means of an appendage with which she is provided. The eggs hatch out, and the young larvæ for a time feed on the seeds, each fruit containing either one or two of the little pests. Even at this point there are indications of the attack of the insect, as the berries colour prematurely. If examined they will usually be found to contain the little grubs. They do not feed on the seeds after the end of June, but emerge therefrom, and spin a small white cocoon on the trees and in the neighbourhood of the fruit-buds. Here they remain until the next spring, when they come out of their winter retreat and bore into the shoot, with what results has been already shown. The caterpillars are reddish, and so small when they are exposed that it would be practically impossible to see them. They are, moreover, not to be reached by insecticides once they have taken up their abode in the shoots. What, therefore, might be done is to syringe into the bushes something which, while it would not affect the fruit, would kill the larvæ. Killmright or similar soft soap preparations would answer very well. At pruning time, too, the bushes should be carefully gone over with a glass, and if the insects' presence be detected, all prunings should be carefully burned.

CUSCUTA. SYNS. *Buchingera, Cuscutina, Cussutha, Engelmannia, Epilinella, Grammica, Lepidanche, Monogynella, Succuta.* This genus includes about eighty species, broadly dispersed over the temperate and warmer regions of the globe.

CUSCUTINA. A synonym of **Cuscuta** (which *see*).

CUSP. A short, sharp point.

CUSPARIA (from *Cusparé*, the Venezuelan name for the bark of *Cusparia febrifuga*, which yields a valuable febrifuge, now enumerated in the British Pharmacopœia). ORD. *Rutaceæ*. A genus embracing about a score species of mostly small, stove trees, of Palm-like habit, with unbranched stems and a crown of handsome leaves, natives of tropical America; it was included by Bentham and Hooker under *Galipea*, but is now considered distinct. Petals more or less completely combined, in some cases forming a vase-like corolla. The following species thrive in a compost of loam and leaf-mould, and may be increased by seeds.

C. heterophylla (variable-leaved). *fl.* borne in supra-axillary racemes. *l.* lanceolate, the mid-nerve slightly pubescent. *l.* three- to five-foliolate, borne on long petioles. Brazil.

C. macrophylla (large-leaved). The correct name of *Galipea macrophylla.*

Cusparia—*continued.*

C. odoratissima (very sweet-scented). The correct name of *Galipea odoratissima.*

C. undulata (waved). *fl.* white, about ⅜in. long, borne in racemes from the axils of the leaves, which overtop them. *l.* palmately compound, with five leathery leaflets. Probably Brazil, before 1836.

CUSSUTHA. A synonym of **Cuscuta** (which *see*).

CUSTARD APPLE of the United States. *See* **Asimina triloba.**

CUT-FINGER. *See* **Vinca major.**

CUT-TOOTHED. Having deep and sharp teeth.

CYAMUS. A synonym of **Nelumbium** (which *see*).

CYANANTHUS (of Griffith). A synonym of **Staurantherа** (which *see*).

CYANASTRUM (from *kyanos*, blue, and *astron*, a star; in allusion to the colour and form of the flowers). ORD. *Hæmodoraceæ*. A monotypic genus. The species is a stove plant, not yet in general cultivation.

C. cordifolium (cordate-leaved). *fl.* purple, stellate, 1in. across, on short, erect scapes. *l.* cordate, 6in. long; petioles 9in. long. Rootstock creeping. Western Tropical Africa, 1894.

CYANITIS. A synonym of **Dichroa** (which *see*).

CYANOPHYLLUM. This genus is included, by the authors of the "Genera Plantarum," under **Miconia** (which *see*). To the species described on pp. 414-15, Vol. I., the following should be added:

C. aspersum (besprinkled). This species is something in the way of *C. magnificum*, but the leaves are more elongated, and are coated with a most delicate down, which gives them a beautiful, velvety appearance. Habitat not recorded, 1893.

CYANOTHAMNUS. Included under **Boronia** (which *see*).

CYANOTIS. SYNS. *Tonningia, Zygomanes.* Including *Erythrotis.* This genus is distributed over the warmer regions of the globe.

C. vittata (striped). A synonym of *Zebrina pendula.*

CYANOTRIS. A synonym of **Camassia** (which *see*).

CYANUS. Included under **Centaurea** (which *see*).

CYATHEA. Including *Metaxya.* This genus, which embraces about eighty species, natives of tropical and sub-tropical regions, contains some of the most beautiful of all known Tree-Ferns. As regards the beauty of their foliage, they are equal in every respect to any *Alsophila* or *Hemitelia*, with which they are closely connected, while they offer a great variety in the sizes of their trunks; those inhabiting temperate regions, such as *C. dealbata*, *C. medullaris*, &c., are mostly stout and destitute of spines, whereas most of the tropical kinds are slender compared with their height, and, in many cases, are densely armed with stout spines. All the species are evergreen, and to make good growth they require an abundance of water at the roots, and their trunks to be kept constantly moist. By these means only can Cyatheas be induced to produce fine heads of fronds, which last all the longer on the plants if they have gradually been inured to the sun during the summer. Like all other Tree-Ferns, Cyatheas are satisfied with very little pot-room. The soil in which they should be potted, tubbed, or, better still, planted in the Fernery, is a mixture of three parts fibrous peat, one of loam, and one of coarse silver-sand. All are of very easy culture,

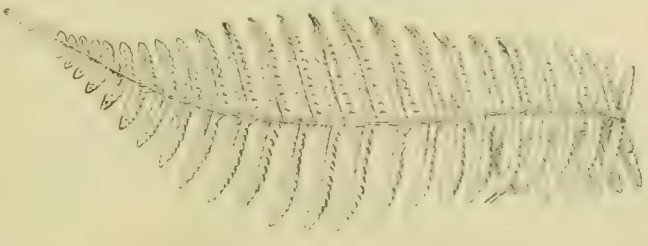

FIG. 285. PINNULE OF CYATHEA INSIGNIS

Cyathea—*continued.*

and, provided the moisture about the trunk and the roots be well attended to, there need be very little fear of failure in their cultivation. None among the numerous species known is in the habit of producing adventitious growths along the trunk or at the base, and none is known to be proliferous. The plants are therefore usually propagated from their spores, which are abundantly produced and germinate freely, making very showy young plants in the course of a couple of seasons.

C. medullaris is of very rapid growth; when planted in a conservatory where plenty of room can be allowed for its perfect development, it makes a good-sized stem or trunk in a comparatively short time, and proves by far the most imposing of all known Tree-Ferns which will succeed under cool treatment.

To those described on p. 415, Vol. I., the following should be added:

C. aculeata (prickly). A garden synonym of *Alsophila aculeata.*

C. Beyrichiana (Beyrich's). A synonym of *Hemitelia setosa.*

C. dealbata. Of this species there is a coloured variety, *tricolor.*

C. funebris (funereal). A garden synonym of *C. sclerolepis.*

C. horrida (horrid). A synonym of *Hemitelia horrida.*

C. insignis. A pinnule of this magnificent stove species is shown in Fig. 285.

C. Lindeniana (Linden's). A garden synonym of *C. mexicana.*

C. Mastersiana (Dr. Masters'). A provisional name for a plant with a caudex apparently not longer than 3ft., surmounted by graceful fronds 3ft. to 4ft. long, the basal part densely spiny. Habitat not recorded, 1894.

FIG. 286. CYATHEA MEDULLARIS.

C. medullaris. The habit of this magnificent and popular greenhouse species is shown in Fig. 286.

C. mexicana (Mexican). *fronds* bipinnate; pinnules smooth, spear-shaped, 3in. to 4in. long, cut into oblong, slightly sickle-shaped lobes. *sori* disposed chiefly in the lower half of the lobe, on the back of a simple vein or at the forking of a divided vein; involucres thin and fragile. Mexico. Stove. SYNS. *C. Lindeniana* (of gardens), *Alsophila Van Geertii.*

C. microphylla (small-leaved). *cau.* 4ft. high. *sti.* and rachises rusty-tomentose. *fronds* 2ft. to 3ft. long, oblong-ovate, acuminate, tripinnate; primary pinnæ sessile, broadly oblong, acuminate; secondary ones similar but smaller, crowded; pinnules scarcely two lines long, ovate-oblong, deeply pinnatifid; lobes entire. *sori* solitary at the base of the veinlet; involucre globose. Andes of Peru and Ecuador, 1883. Greenhouse.

C. princeps (foremost). A synonym of *C. insignis.*

C. pygmæa (dwarf). A provisional name for a plant having a caudex about 2ft. high, and soft, dark green fronds remarkable for the absence of the shiny appearance of most species of this genus. Habitat not recorded, 1894.

C. sclerolepis (hard-spined). *sti.* greyish, rough with hard and sharp points, furnished at base with firm, shining, brownish-black scales. *fronds* smooth, seldom more than 1ft. long, tripinnate; pinnæ less than 1ft. long; pinnules sessile, 2in. long, cut down into blunt, entire, sickle-shaped segments. *sori* small, abundant; involucres parchment-like. New Caledonia. Stove. SYN. *C. funebris* (of gardens).

C. sinuata (sinuate). A synonym of *Schizocæna sinuata.*

C. Smithii (Smith's). A synonym of *Hemitelia Smithii.*

C. spinulosa (slightly spiny). *sti.* and main rachis strongly aculeate, often dark purple. *fronds* glabrous, ample, somewhat flaccid; pinnules oblong, acuminate; lobes acute, serrulated, having small, bullate scales on the costules beneath. *sori* copious, close to the costules; involucre globose, very thin, membranous, soon breaking irregularly. India, 1883. Stove. (H. S. F. 12 c.)

CYATHIFORM. Shaped like a wine-glass.

CYATHOSTYLES. A synonym of **Cyphomandra** (which *see*).

CYBELION. A synonym of **Ionopsis** (which *see*).

CYBIOSTIGMA. A synonym of **Ayenia** (which *see*).

CYCAS. About fifteen species, natives of tropical Asia, Africa, Australia, and Polynesia, are here included. To those described on p. 416, Vol. I., the following should be added:

C. angulata (angled). *l.* borne on tetragonal petioles; pinnæ lanceolate-linear, the lower ones opposite, the upper ones alternate and much smaller; rachis ancipitous nearly to the apex. Australia, 1874.

C. Beddomei (Beddome's). *l.* about 3ft. long and 9in. broad; segments about ¼in. broad; rachis sub-quadrangular; petiole quadrangular, furnished at the base with tufted tomentum, and in the upper third with a few minute teeth. *cones* (males) about 13in. long and 3in. in diameter, slightly stipitate, the scales tapering from a deltoid base, acuminate. Stem (? young) a few inches high, with closely imbricated, glabrescent leaf-bases. India, 1883. Sir W. Thiselton Dyer considers this a reduced form of *C. circinalis.* (T. L. S., ser. ii., vol. ii., p. 85.)

C. Bellefonti (Marquis de Bellefont's). *l.* recurved, glabrous, elliptic, pinnatisect; leaflets sessile, linear-lanceolate, 3½in. to 4in. long, acuminate at apex, the margins flat, glaucescent; petioles short, spinulose at base, the spines small, straight. Trunk short, cylindrical, erect, clothed with fuscous-greyish scales. Tonkin, 1886. (I. H. 1886, 586.)

C. Boddami (Boddam's). A garden synonym of *C. pluma.*

C. Duivenbodei (Duivenbode's). *l.* pinnate, 3ft. to 3½ft. long; leaflets crowded, acuminate, 1in. broad. Trunk spiny, covered with blackish-brown scales. Moluccas, 1886.

C. inermis (unarmed). *l.* much like those of *C. revoluta*, but with rather broader pinnæ, which are very numerous, linear, spiny-acuminate, and revolute on the margins; petioles usually unarmed. Cochin China, 1848.

C. pluma (plume). According to Sir W. Thiselton Dyer, this only differs from *C. circinalis* in its smaller leaves with narrower leaflets. 1877. SYNS. *C. Boddami* and *C. squamosa* (of gardens).

C. squamosa (scaly). A garden synonym of *C. pluma.*

C. undulata (wavy). *l.* having undulated, acute, herbaceous pinnæ; petioles wholly pilose. Habitat uncertain, 1831. Closely allied to *C. circinalis.*

C. Wendlandii (Wendland's). This is described as "a handsome species from Madagascar, somewhat resembling the Dioons in habit, but differing in the leaflets, which are not serrated." 1895.

C. Armstrongii and *C. imperialis* are also, or have been, in cultivation.

CYCLAMEN. This genus is distributed over Central Europe, Western Asia, and the Mediterranean region. To the species, &c., described on pp. 417-8, Vol. I., the following should be added:

C. alpinum (alpine). *fl.* purple-red, with a blackish eye. *l.* small, marked with white. Asia Minor, 1892. A very dwarf plant, probably a form of *C. europæum* from a high elevation.

C. Atkinsi (Atkins's). A variety of *C. ibericum.*

Cyclamen—*continued.*

C. Clusii (Clusius'). An Italian form of *C. europæum.*

C. colchicum (Colchican). This differs from *C. europæum* mainly in having wider and more obtuse corolla segments, and larger leaves and tubers. Caucasus, 1897.

C. cyprium (Cyprian). A synonym of *C. neapolitanum.*

C. hederæfolium (Ivy-leaved). A synonym of *C. repandum.*

C. libanoticum (Lebanon). *fl.* white, shading to deep pink, with a dark crimson spot at the base, sweetly scented, about 1in. wide; peduncles about 6in. long. January and February. *l.* developed before the flowers, orbicular, with a white zone, very firm in texture. Corms large, irregular shaped. Palestine. A very fine, hardy species; it prefers a half-shady situation.

C. littorale (shore-loving). An Italian form of *C. europæum.*

C. orbiculatum (orbicular). A variety of *C. Coum.*

C. Peakianum (Peak's). An Italian form of *C. europæum.*

FIG. 287. CYCLAMEN PERSICUM.

C. tauricum (Taurian). *fl.* pure white. *l.* large, often marked with silvery-grey. Taurus, 1892. This also is probably a variety of *C. europæum.*

C. vernum (vernal). A synonym of *C. repandum.*

Varieties. Amongst the *C. Persicum* varieties (Fig. 287), the following may be named:

FIMBRIATA, the flowers of this section are of the usual form, but the foliage is deeply fimbriated; GRANDIFLORA ALBA, flowers very large, and pure white; PAPILIO, the flowers of this section have a great range of colour, and the petals of each being much fimbriated, give the flowers the appearance of a butterfly; VIVID, a very dark scarlet flower, very large.

CYCLANTHACEÆ. A natural order of perennial herbs or shrubs, all natives of tropical America. Flowers monœcious, arranged in superposed cycles or in a continuous spiral; spadices axillary, solitary, pedunculate, simple, rather short, cylindrical or oblong; spathes two to six, inserted on the peduncle, including the immature spadix, caducous; peduncle short or elongated, sheathing at base. Leaves distichous or spirally disposed, petiolate, flabellate, entire, bifid, or bipartite, parallel-nerved, complicate in vernation; petioles short or elongated, sheathing at base. *Carludovica palmata* yields the much-valued straw from which are manufactured Guayaquil or Panama hats. The order embraces four genera—*Carludovica*, *Cyclanthus*, *Ludovia*, and *Stelestylis*—and, as at present known, about thirty-five species.

CYCLANTHERA (from *kyklos*, a circle, and *anthera*, an anther; in allusion to the disposition of the anthers). SYN. *Discanthera.* ORD. *Cucurbitaceæ.* A genus embracing about a score species of stove, climbing annuals, with a perennial root. Flowers yellow, greenish, or white, monœcious, sometimes six-parted, usually minute; males racemose; females solitary. Fruit obliquely ovoid, somewhat fleshy, bristly or spiny. Leaves entire, lobed, or pedately five- to seven-foliolate. Tendrils simple or cleft twice or more. Only one species calls for mention here. For culture, *see* **Gourds.**

C. pedata (pedate). Climbing Cucumber. *fl.*, male racemes axillary, as long as the leaves; females scarcely prickly. *fr.* glaucous-green, ovate, acute, fistular, clothed with soft prickles. *l.* cordate, pedately (about) five-lobed; lobes mucronate, lightly argutely-serrated, slightly scabrous on both sides; sinus rounded. Tendrils bifid. *h.* 15ft. to 18ft. Mexico.

CYCLANTHUS (from *kyklos*, a circle, and *anthos*, a flower; in allusion to the spiral arrangement of the flowers). SYNS. *Cyclosanthes*, *Discanthus.* ORD. *Cyclanthaceæ.* A small genus (four or five species?) of stove, perennial, stemless, milky herbs. Flowers odorous, the males and females superposed in alternate rings, or disposed in a confluent spiral; spathes numerous; peduncle very long, naked or bracteate, cylindrical. Leaves clustered, long-petiolate, bifurcate: segments lanceolate, one-ribbed, plicate, parallel-nerved; petioles terete, sheathing at base. For culture of the species introduced, *see* **Carludovica.**

C. bipartitus (bipartite). *fl.*, spadix straight, cylindrical; spathe yellow, four-leaved, spreading; scape 2ft. long. *l.* plicate, sometimes entire, ovate-lanceolate, but more frequently divided more or less deeply in the upper portion—sometimes even to the base—into two lanceolate-linear lobes; petioles 3ft. to 6ft. long. Guiana.

C. cristatus (crested). *fr.*, spadix 7in. to 8in. long, 2in. in diameter, oblong. *l.* shortly petiolate, 3ft. long, deeply bifid; lobes oblong, falcate-connivent, acute, 4in. to 5in. broad. Colombia.

C. discolor (two-coloured). *l.* bifid, the two divisions lanceolate, with a tapered point more or less frilled at the edges; young leaves streaked with a tawny-orange hue, which passes off as they become matured. 1882. A remarkable plant.

C. Godseffianus (Godseff's). *l.* rich green, oblong-obovate, tapering to a sheathing stalk. Habitat not recorded, 1892.

CYCLONEMA. Included under **Clerodendron** (which *see*).

CYCLOPIA (from *kyklos*, a circle; in allusion to a roundish mark on the standard). This is the correct name of the genus described on p. 171, Vol. II., as *Ibbetsonia*, which includes about nine species. Flowers yellow, solitary on axillary peduncles; petals about as long as the calyx; standard nearly orbicular, twisted at base, with a short, recurved claw; wings oblong; keel incurved, obtusely beaked. Pods oblong, flat, compressed. Leaves sessile, digitately trifoliolate, or rarely with but one leaflet; stipules wanting. *C. genistoides* is probably the only species in cultivation.

CYCLOPOGON. A synonym of **Spiranthes** (which *see*).

CYCLOSANTHES. A synonym of **Cyclanthus** (which *see*).

CYCLOSIA. A synonym of **Mormodes** (which *see*).

CYCNOCHES. About fourteen species, natives of tropical America, are included in this genus. Flowers unisexual; sepals sub-equal, free, spreading; petals similar, but rather broader; lip fleshy, continuous with the base of the column, spreading, contracted into a claw at the base, above lanceolate or orbicular, entire, or variously lobed, crested, or fringed. To the species described on p. 419, Vol. I., the following should be added. *See also* **Luddemannia.**

C. barbatum. The correct name is *Polycycnis barbata.*

C. chlorochilum. The flowers of this species are very clearly shown in Fig. 288, while Fig. 289 gives a good idea of the general habit of the plant.

C. Haagii (Haag's). *fl.* 2in. to 2½in. broad, five to seven in inclined racemes; sepals and petals yellowish-green, brownish-green at back; lip white or suffused with pale rose, sparsely spotted with reddish-brown, cordate at base; column long, slender, speckled with reddish-purple below. October. *l.*, lower ones 3in. to 4in. long, oblong-lanceolate; upper ones 6in. to 8in. long, recurved, lanceolate. Stem 6in. high, 1in. thick. Brazil, 1891. (B. M. 7502.)

Cycnoches—*continued.*

FIG. 288. FLOWERS OF CYCNOCHES CHLOROCHILUM.

C. musciferum. The correct name is *Polycycnis muscifera.*

C. peruvianum (Peruvian). *fl.* disposed in a drooping raceme; sepals and petals pale green, spotted with purplish-brown; lip white, cut into radiating, clavate processes. Peru, 1891. A curious species, allied to *C. ventricosum.* (L. vii., t. 301.)

C. Pescatorei (Pescatore's). A synonym of *Lueddemannia Pescatorei.*

C. Rossianum (Ross's). *fl.*, males yellowish-green, with brown spots, 1½in. in diameter, disposed in slender racemes; females bright green, solitary, twice as large as the males. Origin unknown, 1891.

C. stelliferum (star-bearing). A synonym of *C. Warscewiczii.*

C. versicolor (various-coloured). *fl.*, males 2in. to 2½in. in diameter, many in pendulous racemes; sepals and petals tawny-green with a velvety gloss and with close-set, longitudinal, brown lines; lip creamy-white, spotted with red in the front of the two erect teeth in the apical part; female flowers unknown. Brazil, 1888.

CYCOCTONUM ROSEUM. A synonym of **Cynanchum roseum** (which *see*).

CYDONIA. SYN. *Chænomeles.* Bentham and Hooker include this genus under *Pyrus*, but for horticultural purposes it has been kept distinct in this work. To the species and varieties described on p. 419, Vol. I., the following should be added:

C. citripomma (Citron-fruited). *fl.* of a brilliant cherry-red, large. Spring. *fr.* orange-yellow, with an agreeable odour, egg-shaped; flesh yellow, firm, juicy, more or less acid;

Cydonia—*continued.*

September and October. *l.* lanceolate or oblong-elliptic, attenuated at both ends, finely toothed. Raised from seeds in 1869. SYN. *Chænomeles citripomma* (R. H. 1876, 331; 1891, f. 11).

C. Japonica Semirenkiana (Semirenk's). A garden sport with creamy leaves. 1883.

C. j. serotina (late). A late-flowering form of the typical *C.* (*Pyrus*) *japonica.* 1894. (R. H. 1894, p. 424, f. 155, 156, under name of *Chænomeles japonica serotina.*)

C. vulgaris marmorata (marbled). A garden variety, having the leaves variegated with white and yellow. 1890.

CYLICADENIA. A synonym of **Odontadenia** (which *see*).

CYMATION. A synonym of **Ornithoglossum** (which *see*).

CYMBIDIUM. SYN. *Iridorchis.* Many of the more popular Cymbidiums, such as *C. Lowianum*, *C. giganteum*, *C. cyperifolium*, *C. grandiflorum* (*Hookerianum*), and the now plentiful and lovely *C. Traceyanum*, are found to do better under cool conditions than when grown in the stove. A winter temperature of 50deg. is quite sufficient, with, say, a summer temperature of about 60deg. Under cooler conditions the plants do not require so much water. In winter especially it must be given with great discretion, or the result will be disastrous. Excessive moisture, with cool conditions inside the house, generally develop "black spot" and disfiguration of the foliage. This must be avoided by keeping the plants in a

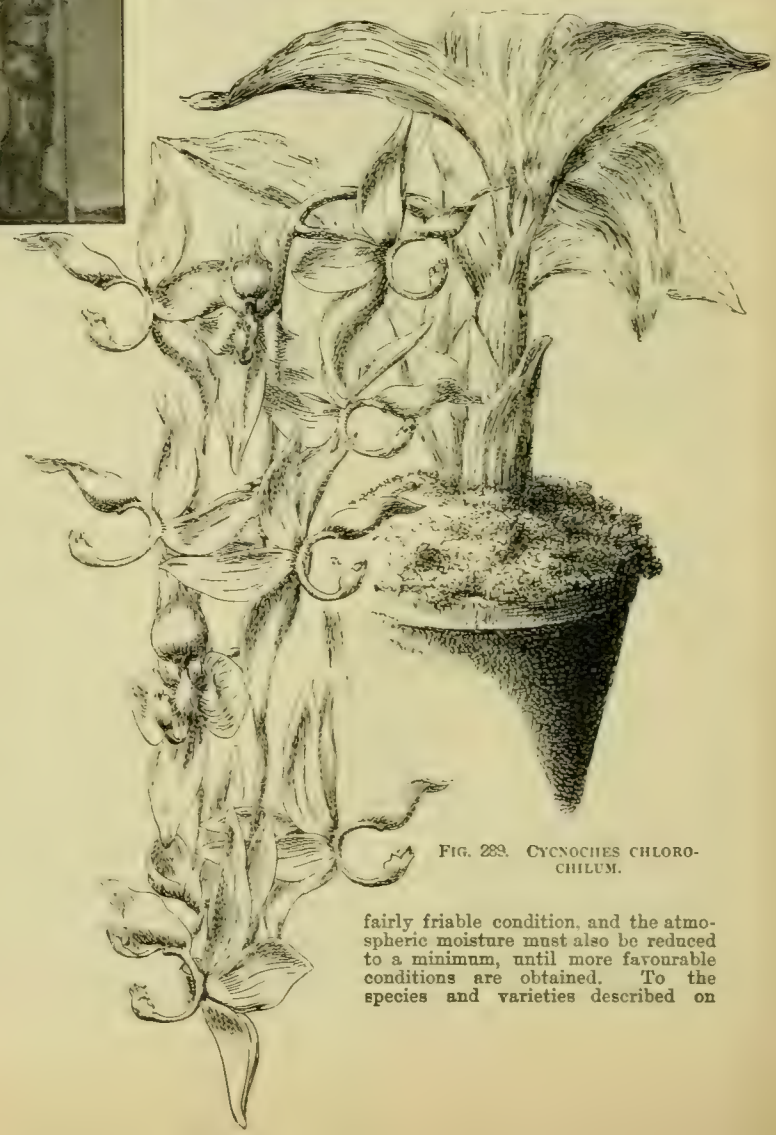

FIG. 289. CYCNOCHES CHLOROCHILUM.

fairly friable condition, and the atmospheric moisture must also be reduced to a minimum, until more favourable conditions are obtained. To the species and varieties described on

Cymbidium—*continued.*

pp. 420-1, Vol. I., the following should be added. *See also* **Cyperorchis.**

C. affine is probably identical with, or a form of, *Cyperorchis Mastersii.*

C. albucæflorum (Albuca-leaved). A synonym of *C. madidum.*

C. chloranthum (yellow-flowered). *fl.* 2in. across; sepals and petals yellowish-green, with a few red spots at the base; lip three-lobed, the side lobes red on the inside incurved, the front lobe yellowish-white spotted with red; column yellow, stained with red; racemes 15in. to 20in. long, many-flowered. May. *l.* ensiform, 15in. to 20in. long, recurved Probably Australian, 1840. (B. M. 4907.)

C. cyperifolium (Cyperus-leaved). *fl.* four to seven, distant, fragrant; sepals and petals pale green and yellow, streaked with red, acute; lip greenish or white, spotted with red, narrow; scape shorter than the leaves. *l.* rigid, 2ft. to 3ft. long, ¼in. to ½in. broad. Sub-tropical Himalaya, &c., 1895.

C. Dayanum is a variety of *C. eburneum.*

C. eburneum Philbrickianum (Philbrick's). *fl.* white; sepals and petals narrow; side lobes of the lip well apart from the narrower middle lobe; callus narrow, with a most obscure mid-keel. 1886. Habit that of *C. Parishii.*

C. elegans (elegant). A synonym of *Cyperorchis elegans.*

C. ensifolium (sword-leaved). *fl.* greenish-yellow, very fragrant; sepals and petals marked with some reddish-brown, narrow lines; lip dotted, ovate, somewhat recurved; scape terete, few-flowered. Late summer. *l.* ensiform, nerved. China and Japan. (B. M. 1751.)

C. e. estriatum (not striated). *fl.*, segments very narrow; sepals green, with a few red lines; petals white, with some purple lines; lip white, the middle lacinia yellow, with a few brown spots; column white, with purple blotches in front. *l.* more than 1ft. long, ½in. broad, with dark spots. Assam, 1887.

C. Finlaysonianum (Finlayson's). *fl.* 2½in. across; sepals and petals dull yellow, linear-lanceolate; lip not saccate, the side lobes streaked with red, the mid-lobe white, reddish-purple towards the tip; raceme slender, 2ft. to 3ft. long. Habit as *C. aloifolium.* Penang. SYN. *C. pendulum* (B. R. 1840, t. 25).

C. Gibsoni (Gibson's). A synonym of *C. lancifolium.*

C. grandiflorum (large-flowered). The correct name of *C. Hookerianum.*

C. g. punctatum (dotted). This form has purplish dots on the lower parts of the segments. 1893. (L., t. 389.)

C. g. Tracyanum (H. Tracy's). A large-flowered variety. 1890. (J. H. ser. iii., xxi., p. 535, f. 71.)

C. Hookerianum. The correct name is *C. grandiflorum.*

C. Humblotii (Humblot's). *fl.* green and black, resembling those of *Cœlogyne pandurata,* but smaller; sepals 1½in. long; petals 1¼in. long, concave; lip three-lobed; panicle branched, erect, 3ft. high, many-flowered. *l.* linear, acute, 1½ft. to 1½ft. long. Stems rhizomatous. Madagascar, 1892.

C. Huttoni is now regarded as synonymous with *Grammangis Huttoni.*

C. lancifolium (lanceolate-leaved). *fl.* 1½in. to 2in. in diameter; sepals white, yellowish, or greenish, lanceolate; petals white, with a pink midrib, rather broader; lip white, spotted with reddish-purple, the side lobes narrow; scape nodding, six- to eight-flowered. *l.* 6in. to 10in. long, long-petiolate. Stem 2in. to 6in. long, fleshy, fusiform. Sub-tropical Himalaya, 1822. (L. B. C. 927.) SYN. *C. Gibsoni* (P. F. G. iii., p. 618, f. 301).

C. Lowianum is probably a variety of *C. giganteum.*

C. L. aureum (golden). *fl.* yellow, with a blotch of orange on the lip. 1893.

C. L. flaveolum (yellowish). *fl.* of a pale yellow, large. 1897. (L., t. 572.)

C. L. superbissimum (most superb). *fl.* having the front lobe of the lip deep maroon-purple. 1893. (L., t. 392.)

C. L. viride (green). *fl.* greenish-yellow without any purple on the lip. 1892.

C. madidum (dyed). *fl.* 1in. in diameter; sepals spreading, petals smaller and erect, both (as well as the mid-lobe of the lip) dull nankeen-yellow; side lobes of lip stained with vinous-purple, erect; racemes pendulous, as long as the leaves, many-flowered. Stems pseudo-bulbous, 3in. to 4in. long. Australia, 1840 and 1889. SYN. *C. albucæflorum.*

C. marginata (margined). A synonym of *Maxillaria marginata.*

C. Mastersii is now removed to *Cyperorchis.* (L., t. 222.)

C. Parishii is a variety of *C. eburneum.*

C. pendulum (of Bot. Reg.). A synonym of *C. Finlaysonianum.*

C. pubescens (downy). *fl.* 1in. to 1¼in. broad; sepals and petals dark purple, margined with yellow or green, linear; lip pubescent, yellow, with a broad band of reddish-purple, or reddish-purple within the margin of the mid-lobe, the side lobes acute; raceme short, pendulous, six- to ten-flowered; scape short, decurved. *l.* 1ft. to 2ft. long, ½in. broad, obtuse. Singapore and Borneo, 1838. (B. R. 1841, t. 38.)

Cymbidium—*continued.*

C. pulcherrimum (very pretty). *fl.* of a waxy white, striped and flushed with crimson; sepals and petals narrow, acute; raceme slender; scape stout. *l.* Grass-like. Northern India, 1891. A charming species.

C. Tracyanum (Tracy's). A form of *C. grandiflorum.*

The following are hybrids:

eburneo-Lowianum	*Lowianum* and *eburneum* (Veitch).
Lowio-eburneum	*eburneum* and *Lowianum* (Rothschild).
Winnianum	*giganteum* and *eburneum* (?) *Mastersianum* (Winn).

CYMBURUS. A synonym of **Stachytarpheta** (which *see*).

CYMINOSMA. A synonym of **Acronychia** (which *see*).

CYNANCHUM. SYNS. *Diploglossis, Endotropis.* To the species described on p. 421, Vol. I., the following should be added. Several plants formerly included here are now referred to **Dæmia, Gonolobus, Marsdenia, Tylophora,** and **Vincetoxicum.**

C. formosum (beautiful). *fl.* pale green, pedicellate; corolla with five spreading or reflexed lobes that are nearly ¼in. long; cymes elegant, 2½in. to 3½in. long; peduncles ¼in. to 2½in. long. *l.* ovate, elliptic-ovate, or oblong-ovate, 1¼in. to 4in. long, cuspidate-acuminate, cordate at base; petioles ¼in. to 1¼in. long. Peru, &c., before 1855, and 1895. Plant twining, wholly glabrous. A distinct species.

C. macrorhizon and *C. purpurascens* have also been introduced.

CYNIPS KOLLARI. *See* **Oak Galls.**

CYNOCRAMBE. A synonym of **Thelygonum** (which *see*).

CYNOGLOSSUM. About sixty species, broadly dispersed over temperate and sub-tropical mountainous regions, are included in this genus. To those described on p. 421, Vol. I., the following should be added. Several plants formerly classed hereunder are now referred to **Lindelofia, Omphalodes,** and **Paracaryum.**

C. furcatum (forked). *fl.* of a beautiful, clear blue, resembling a Forget-me-not, in terminal spikes. June and July. *l.* large, lingulate, acute, greyish-green. Stems erect, branched, forming a bushy tuft 1½ft. in height. India, reintroduced in 1897. A charming biennial.

C. nervosum (prominently nerved). *fl.* of a very deep cobalt-blue, nearly ½in. across; racemes many, axillary and terminal, 3in. to 6in. long, loosely many-flowered. May. *l.*, radical and lower ones 6in. to 10in. long, narrowly oblanceolate, acute, with six or more pairs of strong, scabrid nerves; petioles 2in. to 3in. long. *h.* 3ft. Western Himalayas, 1894. Plant strigillosely pubescent all over. (B. M. 7513.)

CYNORCHIS (from *kyon, kynos,* a dog, and *Orchis;* a name altered by Lindley from the *Cynosorchis* of Thouars). SYN. *Cynosorchis.* ORD. *Orchideæ.* A genus embracing about sixteen species of stove, terrestrial Orchids, with the habit of *Habenaria rotundifolia,* natives of the Mascarene Islands and tropical Africa. Flowers mediocre or rather small, shortly pedicellate; sepals subequal, concave, at length spreading; petals similar or smaller; lip continuous with the column, spreading, as long as the sepals, three- to five-cleft, produced in a spur; column very short; raceme short or rarely elongated, rather loose. Four species call for description. For culture, *see* **Bletia.**

C. elegans (elegant). *fl.* whitish, with a rosy tinge, disposed in three- to seven-flowered racemes; odd sepal gibbous, convex, abrupt over the triangular, acute apex; side sepals ligulate, acute or blunt-acute, longer than the odd sepal; lip with a small angle on each side at the base, the lamina spotted or lined deep purple; scape slender. *l.* cuneate-oblong-lanceolate, acute, 2½in. long by ¾in. wide, light green, striped and barred mauve-purple. Madagascar, 1888.

C. grandiflora (large-flowered). *fl.* 1½in. across; sepals and petals greenish, spotted with purple, small; lip bright rose-purple, large, four-lobed, with a long spur; scapes erect, 1ft. long, one- or two-flowered. *l.* ensiform, annual. Madagascar, 1893. (B. M. 7564; G. C. 1893, xiii., p. 197, f. 29.)

C. g. albata (whitish). *fl.* scented; lip white, purple at base.

C. g. purpurea (purple). *fl.* scentless; lip purple, spotted at base.

C. Lowiana (Low's). *fl.*, sepals and petals whitish-green; lateral sepals oblong, obtuse; odd sepal convex-oblong, blunt-acute, shorter than the lateral ones; petals ligulate, acute; lip lilac, three-cleft, the lateral laciniæ linear, extrorse, the mid-lacinia

Cynorchis—*continued.*

deeply two-cleft, with a deep purple, obcordate spot at base. *l.* one or two, about 9in. long, ⅔in. wide, dark green. Madagascar, 1888.

C. purpurascens (purplish). *fl.*, dorsal sepal green and red, ¼in. long, the lateral ones pale green, ¼in. long; petals rose, ¼in. long; lip bright rose-red, 1¼in. long; peduncle 6in. to 10in. long, two- to ten-flowered. November. *l.* solitary (or with a reduced second), 6in. to 8in. long, lanceolate or oblong-lanceolate, acuminate. Madagascar, &c., 1894. (B. M. 7551.)

CYNOSORCHIS. A synonym of **Cynorchis** (which *see*).

CYNOTIS. A synonym of **Cryptostemma** (which *see*).

CYPELLA. Including *Phalocallis*. This genus embraces eight species, natives of tropical America, differing from *Marica* in their terminal, single or corymbose flowers, plicate leaves, and terete stems.

C. brachypus (short-stalked). A synonym of *Marica brachypus*.

C. plumbea. SYN. *Phalocallis plumbea* (B. M. 3710; F. d. S. 395 and 1466).

CYPERORCHIS (from *Cyperus* and *Orchis*; in allusion to the resemblance to *Cyperus*, and the affinity to *Orchis*). ORD. *Orchideæ*. A small genus (two or three species) of stove, epiphytal Orchids, natives of the East Indies and the Malayan Archipelago, formerly included under *Cymbidium*. Flowers showy; sepals and petals sub-equal, free, erect or somewhat spreading; lip sessile at the base of the column, erect, narrow, concave, the lateral lobes embracing the column, the middle one short, broad, spreading; column rather long, erect, semi-terete; pollen masses two; raceme many-flowered; scape erect. Leaves long, narrow, scarcely dilated at base. Stem short, leafy, hardened or slightly thickened at base. For culture, *see* **Cymbidium**.

C. cochleare (ear-shaped). *fl.* 2in. long; sepals and the revolute petals greenish-brown, very narrow; lip yellow, speckled with red, the mid-lobe golden-yellow, sub-orbicular; raceme elongated; scape 1ft. to 1½ft. long. *l.* 2ft. to 3ft. long, ¼in. to ½in. broad. Sikkim Himalaya, 1880. SYN. *Cymbidium cochleare*.

C. elegans (elegant). *fl.* pale yellow or white, 1½in. long, inodorous, densely imbricated, remaining half-closed, cylindrical; lip having two orange lines on the disk; racemes nodding, many-flowered; scape 6in. to 18in. long, densely clothed with sheaths 2in. to 5in. long. Autumn. *l.* 1½ft. to 2ft. long. Nepaul, 1840. (B. M. 7007.) SYN. *Cymbidium elegans* (L. S. O. 14).

C. Mastersii (Dr. Masters'). The correct name of the plant described on p. 421, Vol. I., as *Cymbidium Mastersii*. (B. R. 1845, 50; F. M. n. s., t. 391; L. J. F., t. 289; P. F. G., t. 78; R., t. 66.) SYN. *Cymbidium affine* (?) (W. O. A. iii. 140).

C. M. album (white). *fl.* pure white, with the exception of the yellow keels; deliciously fragrant. Winter. India, 1889. (R., ii., t. 36, under name of *Cymbidium Mastersii album*.)

CYPERUS. Mariscus (which *see*), formerly included here, is now kept distinct. To the species, &c., described on p. 422, Vol. I., the following should be added:

C. alternifolius variegatus gracilis (slender). A sub-variety having filiform stems and leaves. 1893.

C. aristatus (awned). An annual species, scarcely 6in. high, native of Mexico, and described as "a pretty, decorative plant." 1893.

C. compressus (compressed). *fl.*, spikes of three to ten spikelets, very shortly spicate; glumes densely imbricated. *l.* often nearly as long as the stem, ⅛in. to ¼in. broad. Stems tufted, 4in. to 16in. long (or, in the dwarf form *pectiniformis*, often 2in. or less). Tropics, except Australia, 1870. Plant green, glabrous. Stove.

C. esculentus (edible). *fl.*, spikelets yellow or yellowish-brown; glumes plicate-striate over nearly their whole length. *l.* (and bracts) long. Stem erect at base. Stolons lateral, long, very slender, bearing tubers. South Europe, India, &c. Half-hardy.

C. distans (distant). A synonym of *Mariscus ferax*.

C. ferox (fierce). A synonym of *Mariscus ferax*.

C. gracilis (slender). A sub-variety of *C. alternifolius variegatus*.

C. laxus. Of this species there is a variegated-leaved form, *variegata*. 1881.

C. natalensis (Natal). A garden name for *Mariscus umbilensis*.

C. Papyrus (Papyrus). The correct name of *Papyrus antiquorum*.

C. reflexus (reflexed). This is described as "a graceful plant, densely tufted, with light green leaves." Argentina, 1895. Although a perennial, it flowers the same year when raised from seeds.

C. umbilensis. A synonym of *Mariscus umbilensis*.

CYPHIA. To the species described on p. 422, Vol. I., the following should be added:

C. tortilis (twisted). *fl.* lilac, axillary, small, solitary; petals recurved at apex. *l.* alternate, petiolate, glabrous, ¼in. to 1¼in. long, the lower ones spathulate-obovate or oblanceolate, the upper ones lanceolate or linear-lanceolate. Stem twining, glabrous. Tubers succulent, edible. South Africa, 1894.

CYPHOKENTIA. Two species of unarmed, stove Palms, natives of New Caledonia, form this genus. Flowers arranged as in *Cyphophœnix*; spathes two, deciduous; bracts short, continuous with the spadix; bracteoles small, imbricated, forming a short cup. Leaves terminal, pinnatisect; segments elongated-ensiform, narrowed at apex, the margins recurved at base.

CYPHOMANDRA. SYNS. *Cyathostyles*, *Pallavicinia*. Flowers pedicellate, racemose; corolla deeply five-lobed. Fruit an oblong or globose, usually large berry. Leaves entire, three-lobed, or pinnatisect.

CYPHONEMA. A synonym of **Cyrtanthus** (which *see*).

CYPHOPHŒNIX (from *kuphos*, bent, and *Phœnix*, a Palm-tree; in allusion to the curved spadix of one of the species in fruiting, and to the affinity of the genus). ORD. *Palmæ*. A small genus (two species) of stove, unarmed Palms, natives of New Caledonia, and closely allied to *Cyphosperma*. Flowers monœcious on the same spadix, spirally disposed in threes, a female between two males; spadix robust, paniculately branched, the branches elongated. Fruit brown, mediocre, elongated-ovoid or ellipsoid. Leaves terminal, pinnatisect; segments coriaceous, elongated-ensiform, narrowed at apex, thickened on the margins. There is a specimen of *C. elegans* (SYN. *Kentia elegans*) at Kew, but it is not in general cultivation.

CYPHOSPERMA. Flowers brown, arranged as in *Cyphophœnix*; spadix branches somewhat distichous; bracts short. Fruit brown, small, globose or cubical-ovoid. Leaves terminal, pinnatisect; segments narrow-ensiform, præmorse-toothed, thickened and recurved at base.

CYPRESS, AFRICAN. *See* **Widdringtonia.**

CYPRESS, DECIDUOUS. *See* **Taxodium distichum.**

CYPRIPEDIUM. SYN. *Criosanthes*. This genus embraces about sixty species, natives of Europe, temperate and tropical Asia, North America, and Mexico. With the exception of the Cattleya family, no Orchids have been so extensively used for hybridisation as the *Cypripedium* and *Selenipedium*. The result is that the increase in variety has been enormous. In many instances most successful and desirable forms have been produced, while in others practically failures have to be recorded. It is remarkable also that when failures have occurred such have been from the use of some of the best species. Take for example *C. Spicerianum*. Such a fine species naturally was looked upon as a likely parent, and extensively used. The records, however, show that though it has been used in the production of nearly a hundred distinct crosses, out of this number it would be difficult to name a dozen really good things. The majority are useful for cut-flower purposes, retaining the free-flowering characteristics of *C. Spicerianum*, but in point of beauty and quality they are not to be compared with the parent species.

The introduction of species during the past few years has brought fresh material to the hand of the hybridist, and this has enabled him to evolve a new section of hybrids. The most remarkable are those derived from the use of *C. bellatulum* as a parent. Still more wonderful is the rapidity with which these have been produced, as it was only in the year 1888 that *C. bellatulum* was first introduced. These crosses, as a reference to the list of hybrids will show, now reach a formidable total, and are more sought after and more valuable than any of the Cypripediums.

C. Rothschildianum has so far proved most successful in the few instances in which it has been used. Secondary hybrids also are now being freely produced, so that, in a few years' time, we may look forward to quite a new class.

Recently a fresh classification of the genus has been arranged. In the body of this work we recognised the natives of the Western hemisphere as Selenipediums—that is, the class to which *S. caudatum*, *S. Schlimii*, &c.,

Cypripedium—*continued.*

belong, retaining the original name of Cypripedium for the Eastern section. We still retain these names for the species and list of hybrids, as we do not consider the matter sufficiently familiar outside the "specialist" to adopt the newly classified names; but as they may be useful for reference purposes we give them together with a few of species in each division.

FIG. 290. FLOWERS OF HARDY CYPRIPEDIUMS.

CYPRIPEDIUM. This is confined to what is termed the hardy section (see Fig. 290), to which *C. pubescens*, *C. calceolus*, &c., belong.

PAPHIOPEDIUM includes the whole of the Eastern section, previously classed as Cypripediums.

PHRAGMIPEDIUM includes the species previously distinguished as Selenipediums, such as *S. caudatum*, *S. Lindleyanum*, *S. longifolium*, *S. Schlimii*, &c.

SELENIPEDIUM. This embraces three kinds practically unknown in cultivation. They are natives of Guiana, Brazil, and Central America—*S. chica*, *S. Isabellianum*, and *S. palmifolium* (of Reichenbach).

To those described on pp. 423-7, Vol. I., the following should be added. Except where otherwise indicated, they require stove treatment. Several species formerly included here are now referred to **Selenipedium.**

Cypripedium—*continued.*

C. Appletonianum (Appleton's). A form of *C. Bullenianum.*

C. Argus Moensii (Moens'). *fl.*, dorsal sepal and petals broader than in the type; spots on the petals larger and more numerous.

FIG. 292. CYPRIPEDIUM CALLOSUM SANDERÆ

C. barbatum Crossii. The correct name of *C. Crossii.* SYN. *C. orbum.*

C. b. Warnerianum (Warner's). *fl.*, dorsal sepal white, striped green towards the base, with a transverse band of vinous purple, large; petals green-striped above, white towards the base, the rest purple, tipped white; lip deep brownish-purple. March to May. *l.* distinctly tessellated. India. (W. S. O. iii. 11.) There is another variety, *Obrienii.*

C. bellatulum (rather pretty). *fl.* white or whitish-yellow, spotted all over, and as much as 11in. in circumference; staminode very long, oblong, tridentate at apex, beautifully spotted, almost free from hairs. *l.* 10in. long, 3in. wide, beautifully marbled with light, hieroglyphic spots on the upper surface, the lower one being covered with innumerable brown dots. 1883. See Fig. 291. The variety *album* has pure white flowers and green leaves. 1895.

C. Boxallii atratum (dark). *fl.*, dorsal sepal green, speckled blackish-brown; lip and lateral petals reddish-purple irregularly mixed with light green, the upper margin white. 1887. (G. C. 887, i., p. 210.)

C. Bullenianum (Bullen's). *fl.* somewhat smaller and appearing earlier than in *C. Hookeræ* (to which this species is allied); upper sepal with some blackish streaks at base; petals with three or four small, blackish warts on each margin, and having the dilated apical portion edged with pale yellowish-green. North Borneo, 1862. There are three varieties: *anophthalmum*, *Appletonianum*, and *oculatum.*

C. Burbidgei (Burbidge's). A synonym of *C. Dayanum.*

FIG. 291. FLOWERS OF CYPRIPEDIUM BELLATULUM.

Cypripedium—*continued.*

C. californicum (Californian). *fl.* 1in. to 1½in. across the petals; sepals pale brownish-yellow, the lateral ones united into a boat-shaped limb; petals dull yellow; lip white, with a little pink, and obscurely spotted with brown, obovoid-globose, hairy at base within. May. *l.* 3in. to 4in. long, acute. Stem 1ft. to 2ft. high, leafy. California, 1888. Half-hardy. (B. M. 7188; G. & F. 1888, p. 281.)

C. callosum (hard). *fl.* very large, remaining some weeks in perfection; dorsal sepal pure white, striped with dark chocolate-crimson, 2½in. across; petals and pouch soft rose or crimson on a greenish-white ground. Cochin China, 1885. *l.* oval-oblong, acute, 6in. to 9in. long, with blackish-green markings. Greenhouse. In growth this plant resembles a strong *C. barbatum*. (G. C. 1887, i., p. 315; J. H. 1887, p. 7, f. 1; L. ii., t. 73; R. H. 1888, p. 252.)

C. c. Sanderæ (Mrs. Sander's). *fl.* pale; dorsal sepal snow-white, with a few lines of emerald-green at base. 1894. See Fig. 292.

FIG. 293. FLOWER OF CYPRIPEDIUM CURTISII.

C. Chamberlainianum (Rt. Hon. J. Chamberlain's). *fl.* rosy-purple and white, in form somewhat resembling those of *C. spectabile*; sepals strongly pubescent at back; bracts large, boat-shaped; scapes 2ft. high. *l.* strap-shaped. New Guinea, 1892. (G. C. 1892, xi., p. 241, f. 34; Gn. 1893, p. 304; J. H. 1892, p. 294, f. 49; R. H. 1893, p. 141.)

C. Chantinii (Chantin's). A form of *C. insigne*.

C. Charlesworthii (Charlesworth's). *fl.*, dorsal sepal white, veined with rosy-purple, 2½in. wide, the lower one greenish-white, 1in. broad; petals yellowish, tinged with brown, 1½in. long; pouch similarly coloured, somewhat like that of *C. insigne*. 1893. Habit as *C. Spicerianum*. (G. C. 1893, xiv., p. 457, f. 70; J. H. 1893, p. 307, f. 43.)

C. ciliolare (ciliolated). This much resembles *C. superbiens*; sepals and petals having more numerous nerves and more hairy margins; nail of the lip shorter, and the staminode lower and broader; scapes 1ft. to 1½ft. high. *l.* narrow- or elliptic-oblong, 6in. or more in length. Philippines, 1882. (G. C. 1882, xviii., p. 488; I. H. 1884, t. 530.)

Cypripedium—*continued.*

C. concolor chlorophyllum (green-leaved). *fl.* covered with small spots. *l.* free from marbling. 1886.

C. c. Regnieri (Regnier's). *fl.* yellow, with a purple blotch on the outside of the sepals, the staminode ochre, dotted with purple, and having a white margin in front. *l.* large, well marbled. 1886.

C. c. sulphurinum (sulphur-coloured). *fl.* light sulphur, with two dark yellow blotches. 1888.

C. c. tonquinense (Tonkin). *fl.* larger than in the type. Tonkin, 1887. (L. ii. 77.) SYN. *C. tonquinense*.

C. Crawshayæ (Mrs. Crawshay's). *fl.* very large, dorsal sepal pure white, with a pale greenish spot at base; petals, lip, and lower sepals of a pale greenish-yellow. *l.* fleshy, bright green above, greyish beneath. Shan States, 1898. Allied to *C. Charlesworthii*, but quite distinct.

C. Crossii is a variety of *C. barbatum*.

C. Curtisii (Curtis'). This is much like *C. ciliolare*; the petals are narrower, with shorter ciliæ and smaller spots, which latter are numerous at the tops of the petals; lip large, with acute side angles. May and June. *l.* oblong or oval-oblong, 6in. to 8in. long, tessellated with deep and pale green. Sumatra, 1882. See Fig. 293. (G. C. 1890, vii., p. 557, f. 90; L. iii., t. 140; W. O. A. iii., t. 122.)

C. Elliottianum (Elliott's). A synonym of *C. Rothschildianum*.

C. Exul (exile). *fl.*, dorsal sepal white, yellow at base, irregularly blotched with purple; petals resembling those of *C. insigne*; lip like that of *C. Druryi*. *l.* as in *C. insigne*, but much stouter. Siam, 1892. (G. C. 1892, xi., p. 523, f. 77.)

C. E. Imschootianum (Imschoot's). *fl.* larger than in the type; dorsal sepals having darker spots. 1892. (L. vii., t. 327.)

C. fasciculatum (fascicled). *fl.* 1in. to 1½in. in diameter; sepals and petals greenish, lanceolate, acute; lip greenish-yellow, with a purplish-brown margin; spike one- to four-flowered. *l.* twin, ovate or broadly elliptic. North-west America, 1888. More interesting than beautiful. Hardy. (G. & F. 1888, i., p. 90, f. 16.)

C. glanduliferum (gland-bearing). An old name for *C. præstans*.

C. humile (dwarf). A synonym of *C. acaule*.

C. Hyeanum (Hye's). A form of *C. Lawrenceanum*.

C. insigne albens (whitish). *fl.* yellow and white, with scarcely any of the brown markings of the type. 1893.

C. i. albo-marginatum (white-margined). *fl.*, dorsal sepal yellowish-green, broadly margined white, spotted brown on the green part; petals tawny-yellow, with darker veins; lip pale brownish, yellow inside. India, 1886. A distinct variety. (W. O. A. 232.)

C. i. aureum (golden). This variety is remarkable for the golden glow which pervades the flowers, the colouring of which is in other respects of the normal character. 1882.

C. i. Chantinii (Chantin's). The correct name of *C. i. punctatum violaceum* (Gn. xxi., t. 342).

C. i. longisepalum (long-sepaled). *fl.* pale, unspotted; dorsal sepal 2½in. long. 1890.

C. i. montanum (mountain-loving). This name has been given to a series of forms, some of which are distinguished by their richly-marked flowers and by their shorter and narrower leaves. (L., t. 414.)

C. i. Mooreanum (Moore's). *fl.* 5in. in diameter; dorsal sepal greenish-yellow, striped green, broadly margined white, with very large, dull purple spots; petals pale yellowish-green, flushed rosy-crimson, blotched at base; lip bright bronze; spikes 18in. to 20in. long. *l.* 14in. long. 1887.

C. i. Sanderæ (Mrs. Sander's). *fl.* primrose-yellow, with a broad, white, apical margin, and a few brown dots on the central veins of the upper sepal. See Fig. 294.

There are several other minor varieties of *C. insigne*, but the preceding are all that call for description here.

C. javanicum (Javanese). *fl.* 3in. across vertically; sepals and petals pale green, ciliolated, the petals blackish-dotted and with one-third dull purple; lip brownish-green, nearly cylindrical, the infolded lobes spotted with purple; scapes one- or rarely two-flowered. *l.* elliptic-oblong, 6in. to 8in. long, sparingly mottled. Eastern Java, 1840. (F. d. S. vii., t. 703.)

C. j. virens (greenish). *See* **C. virens.**

C. lævigatum. The correct name is *C. philippinense*.

C. Lawrenceanum Hyeanum (Hye's). *fl.*, dorsal sepal white, veined green, large; petals ciliated; lip entirely green. Borneo, 1886. SYN. *C. Hyeanum*.

There are many other varieties of *C. Lawrenceanum*, mainly distinguished by the prominence and rich colour of the veins of the upper sepal, which colour is sometimes diffused over the greater part of the surface.

FIG. 294. FLOWER OF CYPRIPEDIUM INSIGNE SANDERÆ

C. macranthon [not *macranthum*]. See Fig. 295. There is a variety *ventricosum* (S. B. F. G. iv., t. 1) with sepals and petals often 2in. long and the lip lin. to 1½in. in diameter. Thibet, Siberia, &c., 1877.

C. margaritaceum (pearly). *fl.*, sepals and petals deep purple, with rows of blackish-purple dots, shortly ciliated; lip dark brown, covered with small tubercles, slightly concave above, with a circular orifice formed by the short auricles overlapping each other; scape one-flowered. *l.* twin, glaucous-green, spotted with purplish-brown. Yunnan, China, 1888.

C. montanum (mountain-loving). *fl.* brownish-purple, with a white lip, striped with red inside; column yellow, spotted with crimson. *l.* lanceolate, pubescent. *h.* about 1ft. Oregon, 1883. A beautiful little, hardy Orchid. (B. M. 7319; F. & P. 1883, p. 10.) SYN. *C. occidentale* (R. G. 1036).

C. nigritum (blackish). *fl.* near those of a dark variety of *C. barbatum*; dorsal sepal oblong, acute, the lateral ones forming a very narrow body; petals much narrower than the dorsal sepal. *l.* like those of *C. virens*. Borneo, 1882.

C. occidentale (Western). A synonym of *C. montanum*.

C. orbum (orb-like). A synonym of *C. barbatum Crossii*.

C. Pearcei (Pearce's). A synonym of *Selenipedium caricinum*.

C. philippinense (Philippines). The correct name of *C. lævigatum*. SYN. *C. Roebelenii*.

C. Pitcherianum (Pitcher's). A synonym of *C. Argus*.

C. præstans (excelling). *fl.* nearly as large as those of *Selenipedium grande*; sepals nearly equal, the dorsal one banded green and maroon; petals greenish, suffused rose at base, and spotted maroon along the margins, linear-ligulate, much undulated at base; lip greenish-yellow, with a golden crest, shaped like that of *C. Stonei*, having a very long, channelled stalk; peduncle dark-hairy, five-flowered. Papua, 1884. (G. C. 1887, ii., p. 814; I. H. ser. v. 26.)

C. Reichenbachianum (Reichenbach's). A synonym of *Selenipedium longifolium*.

C. reticulatum (netted). A synonym of *Selenipedium Boissierianum*.

C. Roebelenii (Roebelen's). A synonym of *C. philippinense*.

C. Rothschildianum (Baron F. de Rothschild's). *fl.*, odd sepal yellowish, with blackish longitudinal stripes, and white borders, cuneate-oblong, acute; lateral sepals united into one smaller, shorter body; petals yellowish-green, with dark lines, and with dark blotches at base; lip cinnamon-brown, the mouth bordered ochre, very strong, almost leathery; staminode rising erect from a stout base, and bending down into a narrow, beak-like process. *l.* above 2ft. long, from 2½in. to 3in. wide, glossy green, very strong. Papua, 1887. See Fig. 296. (B. M. 7102.) SYN. *C. Elliottianum* (G. C. 1888, iv., p. 556).

C. Sanderæ (Mrs. Sander's). A provisional name for a plant described as having a large, spear-shaped dorsal sepal coloured crimson, yellow, and green; broad, yellow and red petals; and a long, narrow, yellow lip. Habitat not stated, 1896.

C. Sanderianum (Sander's). *fl.*, sepals yellowish-green, nerved purplish-brown; petals purplish-brown, fading to yellowish, spotted and barred purplish-brown towards the base, where there are some retrorse, purple bristles, linear, twisted, 1ft. to 1½ft. long; lip greenish-bronze, in shape resembling that of *C. Stonei*. Malay Archipelago, 1886. (R. 3.)

C. Schomburgkianum (Schomburgk's). This is described as a "small species, with linear leaves and elegant flowers; it is very near *C. caricinum*." British Guiana, 1890.

FIG. 295. FLOWER OF CYPRIPEDIUM MACRANTHON.

C. spectabile album (white). A variety with pure white flowers. 1897.

C. Stonei candidum (white). *fl.* ivory-white, the petals tinged with rose and the lip with lilac. 1892. The type is a native of Borneo, not Brazil.

Cypripedium—*continued.*

C. S. platytænium (broad-bordered). *fl.*, dorsal sepal white, striped purple; petals whitish outside, spotted and tinted yellow, deep crimson-purple at the tips, the inner surface white, blotched reddish-purple. Sarawak. (F. M. ser. ii. 414; G. C. 1867, p. 1118; R. X. O. ii. 161; W. S. O. iii. 14.)

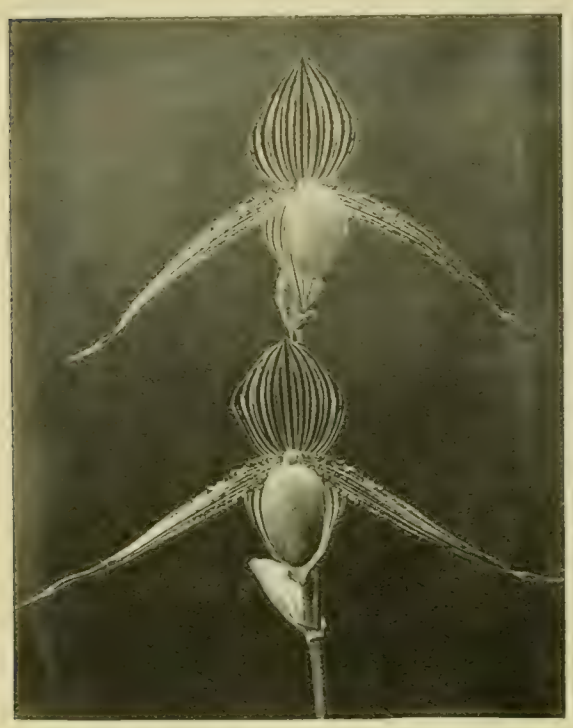

FIG. 296. FLOWER OF CYPRIPEDIUM ROTHSCHILDIANUM.

C. tonquinense (Tonkin). A variety of *C. concolor.*

C. tonsum (shorn). *fl.*, dorsal sepal whitish, with twenty-one green nerves, a small brown blotch on each border inside, and a green disk outside, the lower sepals half as long as the lip; petals oblong-ligulate, acute, nearly free from ciliæ, green, washed with sepia, and spotted with dark brown; lip greenish, the upper surface washed with sepia. *l.* rather narrow, marked as in *C. Dayanum.* Sumatra, 1833. (G. C. 1883, xx., p. 262.)

ventricosum (big-bellied). A variety of *C. macranthon.*

C. venustum Measuresianum (Measures'). *fl.* white and green. 1893.

C. v. pardinum (leopard-marked). *fl.*, sepals and petals white, striped green, the petals also blotched dark chocolate; lip greenish-yellow, marked rose. 1887. Perhaps the finest, and certainly the largest-flowered, variety. (F. M. n. s., t. 51; G. C. 1887, i., p. 382.)

C. Victoriæ-Mariæ (Victoria Maria's). *fl.* 3in. long; sepals green, the dorsal one streaked with red; petals green, with broad purple margins and nerves, 2in. long; lip dull purple, green round the mouth, 2in. long, ¾in. broad; racemes erect, many-flowered, scape 1½ft. high. March. *l.* 1ft. long, 1½in. to 2in. broad, emarginate. Sumatra, 1897. (B. M. 7573.)

C. villosum. Of the numerous varieties of this species the following are all that call for description here. See Fig. 297.

C. v. aureum (golden). *fl.* 6in. across; upper part of the dorsal sepal bright yellow, broadly margined with white. Moulmein. A fine variety.

C. v. Boxallii. *See* **C. Boxallii.**

C. v. Gortoni (Gorton's). *fl.* of a purplish colour. 1893.

C. v. Measuresianum (Measures'). *fl.* having large, dark blotches, as in *C. Boxallii atratum.* 1893.

C. virens (green). *fl.* having the sepals and petals of a deeper and brighter green than in *C. javanicum* (to which this species is closely allied); petals spreading, reflexed beyond the middle; lip of a deeper brown and glossier. North Borneo, 1858. (R. X. O. ii., t. 162.) SYN. *C. javanicum virens.*

C. Volonteanum (Volonte's). *fl.* more brilliantly coloured and larger in all their parts. *l.* shorter, narrower, and more rigid.

Cypripedium—*continued.*

Otherwise closely resembling *C. Hookeræ.* Borneo, 1890. (G. C. 1890, viii., p. 66, under name of *C. Hookeræ Volonteanum.*) The form *giganteum* has flowers twice as large as in the type. 1893. (J. H. 1893, p. 27, f. 4.)

C. Warnerianum (Warner's). A form of *C. barbatum.*

C. Wolterianum (Wolter's). *fl.* like those of *C. Lowii* (which the plant resembles in general appearance), but differing principally in the smaller inferior sepal, in the colour of the basal part of the petals, in the entirely different staminode, and in their smoothness. Habitat not recorded, 1895.

Hybrids. The following is a list of Cypripedium and Selenipedium hybrids up to date, together with their recorded parentage as far as ascertainable.

Abas	*Stoneii* and *villosum* (Veitch).
Acis	*Lawrenceanum* and *insigne Maulei* (Veitch).
Acteus	*Leeanum* and *insigne Sanderæ* (Veitch).
A. de Lacresse	*Curtisii* and *Rothschildianum* (Sander).
Adonis	*hirsutissimum* and *Curtisii* (Ingram).
Adrastus	*Leeanum* and *Boxallii* (Veitch).
Æolus	*philippinense* and *villosum* (Veitch).
Æsculapius	*Lawrenceanum* and *Harrisianum* (R. I. Measures).
Æson	*Druryi* and *insigne* (Veitch).
Ainsworthii	*Roezlii* and *Sedenii.*
A. J. Harrington	*Leeanum superbum* and *œnanthum superbum* (Sander).
albanensis	*Schlimii* and *Sedenii* (Sander).
Albert Hye	Syn. *Lathamianum.*
Albertianum	*Leeanum* var.
albo-purpureum	*Schlimii* and *Dominii* (Veitch).
Alcides	*insigne* and *hirsutissimum* (Sander).
Alcides Cleo	*insigne Chantinii* and *hirsutissimum* (Graves).
Alector	*barbatum Crossii* and *Spicerianum* (Veitch).
Alfred	*philippinense* and *venustum* (Drewett).
Alfred Bleu	*ciliolare* and *insigne Chantinii* (Bleu).
Alfred Bleu	*Crossianum* and *villosum* (Bleu).
Alfred Hollington	*ciliolare* and *philippinense* (Hollington).
Alfred Truffaut	*Harrisianum-vivicans* and *Spicerianum* (Sander).
Alice	*Spicerianum* and *Stoneii* (Drewett).
Alice Gayot	*Harrisianum* and *insigne* (Lebeuf).
Allanianum	*Spicerianum* and *Curtisii* (Pitcher).
Allanianum superbum	*Spicerianum* and *Curtisii* (R. I. Measures).
allertionense	*villosum* and *bellatulum* (Tate).
almos	*villosum aureum* and *insigne* (Ebner).
almum	*barbatum* and *Lawrenceanum* (Cookson).
Alonzo	*Spicerianum* and *Arthurianum pulchellum* (Veitch).

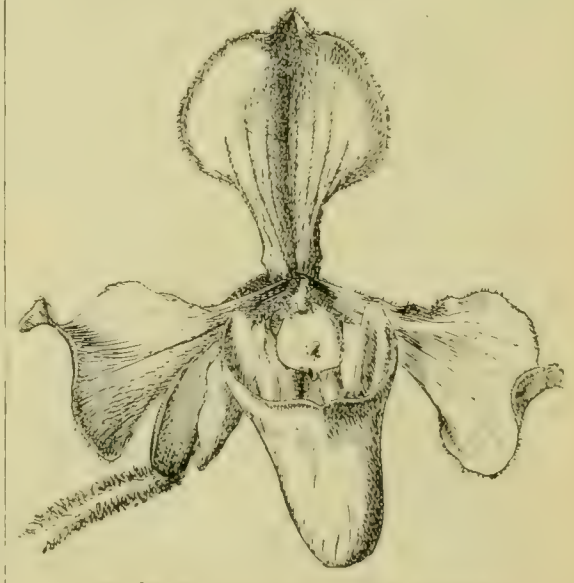

FIG. 297. FLOWER OF CYPRIPEDIUM VILLOSUM.

Cypripedium—*continued.*

Alport	*Lawrenceanum Hyeanum* and *Rothschildianum* (Gratrix).
amabile	*javanico-superbiens* and *Hookeræ* (Seeger).
amabile	*Boxallii* and *Dauthierii* (Page).
amandum	*insigne* and *venustum* (Warner).
Amesiæ	Syn. *Mrs. F. L. Ames.*
Amesianum	*villosum* and *venustum* (Williams).
amethystinum	*villosum* and *Hookeræ* (Bleu).
Amœna	Syn. *Surprise.*
Amphion	*Harrisianum* and *Lawrenceanum* (R. H. Measures).

Cypripedium—*continued.*

Appletoniæ	*Harrisianum* and *ciliolare* (Appleton).
Apuleus	*Lathamianum* and *callosum* (Charlesworth).
Arete	*Spicerianum* and *concolor* (Veitch).
Argo-Arthurianum	*Argus* and *Arthurianum* (R. I. Measures).
Argo-callosum	*Argus* and *callosum* (Cappi).
Argo-Morganiæ	*Argus* and *Morganiæ* (Lawrence).
Argo-Spicerianum	*Argus* and *Spicerianum* (Low).
Argo-Stoneii	*Argus* and *Stoneii* (Cookson)
Ariadne	*Spicerianum* and *selligerum majus* (Statter).

FIG. 298. CYPRIPEDIUM ARTHURIANUM.

Andronicus	Syn. *W. R. Lee* (R. H. Measures).
Angiliæ	*callosum* and *Leeanum* (Martin).
annaerti	*insigne* and *Ashburtoniæ.*
annamense	*Ashburtoniæ expansum* and *Numa* (Statter).
Anna Savage	*Curtisii* and *Chas. Canham* (Kimball).
Annie Ayling	*Curtisii* and *concolor* (Hollington).
Annie Louise	Syn. *Cowleyana.*
Annie Measures	*bellatulum* and *Dayanum* (Sander).
Antigone	*Lawrenceanum* and *niveum* (Veitch).
Anton Jolly	*vernixium* and *Spicerianum* (Jolly).
Aphrodite	*niveum* and *Lawrenceanum* (Veitch).
apiculatum	*Boxallii* and *barbatum* (Veitch).
Apollo	*Stoneii* and *vexillarium* (R. I. Measures).
Arnoldianum	*concolor* and *superbiens* (Pitcher).
Arnoldiæ	*bellatulum* and *superciliare* (Sander).
A. R. Smith	*callosum* and *Druryii* (Sander).
Artemis	*Dayanum* and *Swanianum* (Veitch).
Arthur	*venustum* and *philippinense* (Drewett).
Arthurianum	*insigne* and *Fairieanum* (Veitch). See Fig. 298.
Arthurianum pulchellum	*insigne Chantinii* and *Fairieanum* (Veitch).
Ashburtoniæ	*barbatum* and *insigne* (Cross).
Ashburtoniodes	Syn. *Pitcherianum.*
Ashtonii	*ciliolare superbum* and *selligerum majus* (Lewis).
Ashworthiæ	*Leeanum superbum* and *Spicerianum* (Sander).

Cypripedium—*continued.*

Ashworthianum	*Spicerianum* and *Crossii* (Sander).
Ashworthii	*plunerum* and *Spicerianum* (Sander).
Aspasia	*selligerum majus* and *tonsum* (Sander).
Aspasioides	*selligerum majus* and *Argus* (Rothwell).
Astræa	*philippinense* and *Spicerianum* (Veitch).
Atropos	*Ashburtoniæ expansum* and *purpuratum* (Young).
Atropurpureum	*barbatum nigrum* and *Hookeræ* (Bleu).
Atys	Syn. *Fitchianum.*
Augusta	Syn. *Surprise.*
augustum	*villosum* and *Haynaldianum* (Pitcher).
aurantiacum	Syn. *Crossianum.*
aureum	Syn. *Surprise.*
auricularum	Syn. *vernixium.*
auroreum	*Lawrenceanum* and *venustum* (Cookson).
Aylingii	*niveum* and *ciliolare* (Hollington).
Baconis	*Chlorops* and *Schlimii* (Sander).
Ball, G. S.	Syn. *radiosum.*
barbato-bellum	*barbatum Crossii* and *bellatulum* (Lawrence).
barbato-Charlesworthii	*barbatum Warnerii* and *Charlesworthii* (Lumsden).
barbato-purpurato	*barbatum* and *purpuratum* (Pitcher).
barbato-Veitchii	*barbatum* and *superbiens* (Bleu).
Baron Schröder	*œnanthum superbum* and *Fairieanum* (Veitch).
Bartettii	*insigne Chantinii* and *barbatum* (Baeur).
Bartettii augustum	*barbatum Crossii* and *insigne Kimballiana* (Pitcher).
Basileum	*Druryii* and *Lawrenceanum* (R. H. Measures).
Batalinii	*purpuratum* and *Argus* (Sander).
Beatrice	*Boxallii* and *Lowii* (Drewett).
Beatrice Ashworth	*Leeanum* and *venustum* (Ashworth).
Beechense	*Curtisii* and *superbiens.*
Beeckmanii	*Boxallii* and *bellatulum* (Linden).
Behrensiana	*Io Grande* and *Boxallii* (Sander).
bellato-venustum	*venustum* and *bellatulum* (Lord Burton).
bellato-vexillarium	*bellatulum* and *vexillarium* (Briggs-Bury).
bellinum	*vernixium* and *Harrisianum superbum* (Sander).
Bellona	Syn. *Lathamianum.*
Bellune	*superbiens* and *hirsutissimum* (Vuylsteke).
belmedianum	*Stoneii* and *Farieanum* (Lumsden).
Belus	*Harrisianum nigrum* and *Mastersianum* (Young).
Berenice	*philippinense* and *Lowii.*
bijou	*œnanthum* and *Lawrenceanum* (Ingram).
bingleyense	*Charlesworthii* and *Harrisianum* (Keeling).
Bolerlaerianum	*Dauthierii* and *Harrisianum* (Penwels).
Boltonianum	*calophyllum* and *Leeanum superbum* (Sander).
Bonnyanum	*villosum* and unknown (Bonny).
Bookerii	*ciliolare* and *Spicerianum* (Lewis).
Bosscherianum	Syn. *Eyermanniana.*
Boulemyæ	Syn. *Calypso.*
Boxallio - Rothschildianum	*Boxallii* and *Rothschildianum* (R. I. Measures).
Boyleanum	*Crossianum* and *Harrisianum* (Sander).
Bradshawianum	Syn. *radiosum.*
Bragaianum	Syn. *Godseffianum.*
Brayanum	Syn. *Harrisianum.*
Brennus	*œnanthum superbum* and *Harrisianum* (R. H. Measures).
Brownii	*magnifolium* and *leucorrhodum* (Pitcher).
Brunianum	*Leeanum* and *œnanthum superbum* (Sander).
Bruno	*Spicerianum* and *Leeanum* (Veitch).
Bryan	*philippinense* and *Argus* (Cookson).
Brysa	*reticulatum* and *Sedenii candidulum* (Veitch).
Buchanianum	*Druryii* and *Spicerianum* (Buchan).
Burbidgeanum	*Dayanum* and *concolor.*
Burberryanum	*Boxallii* and *plunerum* (Sander).
burfordiense	*Argus* and *philippinense* (Lawrence).
Burggrenianum	*Dauthierii* and *insigne* (Sander).
Burtonii	*Lowii* and *Hookeræ* (Burton).
Cahuzac	*Spicerianum* and *Haynaldianum* (Sander).
Calanthum	*barbatum Warnerii* and *Lowii* (Veitch).
caligare	*venustum* and *Dayanum* (Veitch).
Calliope	*callosum* and *Lathamianum* (Clarke).

Cypripedium—*continued.*

callo-bellum	*callosum* and *bellatulum* (Lawrence).
calloso-Argus	*callosum* and *Argus.*
calloso-barbatum	*callosum* and *barbatum* (Charlesworth).
calloso-niveum	*callosum* and *niveum* (R. H. Measures).
calloso-Rothschildianum	*callosum* and *Rothschildianum* (Fowler).
calophyllum	*barbatum* and *venustum* (Williams).
calurum	*longifolium* and *Sedenii* (Veitch).
Calypso	*Spicerianum* and *Boxallii* (Veitch).
Cambridgeanum	*Harrisianum* and *insigne punctatum violaceum* (R. I. Measures).
Captain Holford	*superbiens* and *hirsutissimum* (Veitch).
Captain Lendy	*Boxallii* and *Charles Canham* (Ingram).

FIG. 299. FLOWER OF CYPRIPEDIUM CARDINALE.

cardinale	*Sedenii* and *Schlimii albiflorum* (Veitch). See Fig. 299.
Cardinal-Schlim	*cardinale* and *Schlimii* (R. I. Measures).
Carl Peeters	Syn. *Chas. Richman.*
Carnusianum	*Haynaldianum* and *Spicerianum* (Carnuse).
Carrierii	*superbiens* and *venustum* (Carrier).
Cassiope	*venustum* and *Hookeræ* (Seeger).
Castleanum	*hirsutissimum* and *superbiens* (Sander).
Cecilia	Syn. *Maynardii.*
Celeus	Syn. *nitens.*
Celia	*Spicerianum* and *Lowianum* (Low).
Ceres	*hirsutissimum* and *Spicerianum* (Drewett).
Chamber-Leeanum	*Chamberlainianum* and *Leeanum* (Van Gert).
Chantino-ciliolari	*insigne Chantinii* and *ciliolare* (Bleu).
Chantino-Reignerii	*insigne Chantinii* and *concolor Reignerii* (Bleu).
Chapmanii	*Curtisii* and *bellatulum* (R. I. Measures).
Chapmanii magnificum.	*bellatulum* and *Curtisii* (R. I. Measures). See Fig. 300.
Charles Canham	*villosum* and *superbiens* (Veitch).
Charles Gorndoin	*insigne Chantinii* and *vernixium* (Jolibois).
Charles Reffold	*œnanthum superbum* and *Spicerianum* (Ingram).
Charles Richman	*bellatulum* and *barbatum* (Richman).
Charles Steinitz	*philippinense* and *Lawrenceanum* (Sander).
Charlesianum	*Sallierii* and *Leeanum superbum.*
Charpinianum	*Spicerianum* and *Morganiæ.*
chelsiense	*Lowii* and *barbatum Warnerii* (Bull).

Cypripedium—*continued.*

Chillianum	*Gouverianum* and *Rothschildianum* (Schofield).
chloroneuron	*barbatum* and *venustum* (Warner).
Chlorops	*longifolium Hartwegii* and *caricinum* (Sander).
chrysocomes	*caudatum* and *conchiferum* (Seeger).
cilio-villosum	*ciliolare* and *villosum* (Lewis).
claptonense	Syn. *nitens.*
Claudii	*Spicerianum* and *vernixium.*
Clement Loury	*Harrisianum* and *insigne Chantinii* (Jolibois).
Clement Moore	*Dauthierii* and *Leeanum* (Sander).
Cleola	*reticulatum* and *Schlimii albiflorum* (Veitch).
Cleopatra	*Hookeræ* and *œnanthum superbum* (Winn).
Clinkaberryanum	*philippinense* and *Curtisii.*
Clonius	*caudatum Lindenii* and *conchiferum* (Veitch).
Clothilde Moens	*Leeanum superbum* and *Haynaldianum* (Moens).

FIG. 300. FLOWER OF CYPRIPEDIUM CHAPMANII MAGNIFICUM.

Clotho	*Pollettianum* and *Boxallii atratum* (Young).
Clovenfordsi	*superbiens* and *philippinense* (Thompson).
Cobbiana	*Lawrenceanum* and *Sallierii* (Cobb).
Colmanii	Syn. *Eismannianum.*
Comet	*Stoneii* and *superciliare* (Sander).
compactum	*Sedenii candidulum* and *calarum* (Ingram).
Comte Andre de Germiny	*Swanianum* and *Rothschildianum* (Sander).
Comus	*insigne maximum* and *Swanianum* (Graves).
conchiferum	*caracinum* and *longifolium* (Bowering).
concinnum	*villosum* and *purpuratum* (Bull).
conco-bellatulum	*concolor* and *bellatulum* (Statter).
conco-callosum	*concolor* and *callosum* (R. H. Measures).
conco-Lawre	*concolor* and *Lawrenceanum* (Lawrence).
conco-villosum	*concolor* and *villosum* (Sander).
conspicuum	*Harrisianum* and *villosum* (Swan).
Constableanum	*Farieanum* and *Dayanum* (Pitcher).
Constance	*Curtisii* and *Stoneii* (Drewitt).
Cooksonii	Syn. *almum.*
Coppianianum	*Sedenii* and *conchiferum* (Sander).
corbeillense	*Bullenianum* and *insigne* (Maron).
Corndeanii	*Lawrenceanum* and unknown (Swainburn).

Cypripedium—*continued.*

Corningianum	Syn. *Youngianum.*
Cowleyana	*Curtisii* and *niveum* (Tautz).
Cravenianum	*bellatulum* and unknown (Schofield).
Creon	*Harrisianum superbum* and *œnanthum superbum* (Veitch).
Crethus	*Argus* and *Spicerianum* (Veitch).
Crossianum	*insigne* and *venustum* (Ashburton).
Cumea	*longifolium Hartwegi* and *Sedenii* (Graves).
Cupid	*Cardinale* and *Lindleyanum* (Veitch)
Cybele	*Druryi* and *Lawrenceanum* (Pitcher).
Cydippe	*superbiens* and *Hookeræ* (Veitch).
Cymatodes	*Curtisii* and *superbiens* (R. H. Measures).
Cyris	*Bozallii atratum* and *Argus* (Cookson).
Cythera	*Spicerianum* and *purpuratum* (R. H. Measures).
Dædalus	*insigne punctatum violaceum* and *vexillarium superbum* (Young).
Daisyæ	*Lowii* and *œnanthum superbum* (Graves).
Dauthierii	*barbatum* and *villosum* (Van Houtte).
Davisianum	Syn. *Cyris.*
Dayano-Curtisii	*Dayana* and *Curtisii* (Graves).
De Bosscherianum	Syn. *Eyermanniana.*
decorum	*Sallierii Hyeanum* and *Lawrenceanum* (Hye).
Deedmanianum	*Spicerianum* and *Chamberlainianum* (Latham).
delicatum	*Dayanum* and *barbatum Warnerii* (Drewitt).
Dennisianum	*superbiens* and *selligerum majus* (Linden).
Desboisianum	*venustum* and *Bozallii atratum* (Vervaet).
De Witt Smith	*Spicerianum* and *Lowii* (Low).
Diana	Syn. *Eyermanniana.*
Dibdin	Syn. *Cyris.*
Diolare	*villosum* and *venustum* (Cookson).
discolor	*venustum* and unknown (Williams).
Dominii	*caracinum* and *caudatum* (Veitch).
Dominii albiflorum	*caracinum* and *caudatum Wallisii* (Veitch).
Donatianum	*Harrisianum* and *insigne Wiottii* (Sander).
Doncasterianum	*hirsutissimum* and *callosum* (Sander).
Doris	*venustum* and *Stoneii* (Cookson).
Driherianum	Syn. *Leander.*
Dr. Ryan	Syn. *Deedmanianum.*
Drurio-Hookeræ	*Hookeræ* and *Druryi* (Veitch).
Drurio-Lawrenceanum	*Lawrenceanum* and *Druryi* (Veitch).
Drurio-villosum	*villosum* and *Druryi* (Veitch).
Dubium	*Bozallii* and *venustum.*
Duchess of Sutherland	*Youngianum* and *Rothschildianum* (Sander).
E. Ashworth	*plunerum* and *Spicerianum* (Sander).
Echo	*Hookeræ* and *insigne Chantinii* (Graves).
Edithæ	*conchiferum* and *Schlimii albiflorum* (Sander).
Edith Winn	*Stoneii* and *purpuratum* (Winn).
Edwardii	*Fairieanum* and *superbiens* (Pitcher).
Edward Jolibois	*insigne Maulei* and *barbatum* (Jolibois).
E. Holt	*Curtisii* and *Præstans* (Sander).
Eismannianum	*Boxallii* and *Harrisianum* (Seeger).
Electra	Syn. *œnanthum.*
elegans	Syn. *Harrisianum.*
Elinor	*selligerum majus* and *superbiens* (Drewitt).
Elizabethiæ	*Lawrenceanum* and *Parishii* (R. H. Measures).
Elsteadianum	*conchiferum* and *grande* (Ingram).
Empress	*Cardinale* and *Sedenii albiflorum* (Ball).
Endymion	*barbatum* and *Mastersianum* (Young).
enfieldiensis	*Lawrenceanum* and *Hookeræ* (Hollington).
Englehardtiæ	Syn. *Leeanum.*
Enid	*bellatulum* and *Spicerianum* (Rothschild).
Ensign	*Harrisianum* and *barbatum biflorum* (Winn).
Ephialtes	*insigne Chantinii* and *aurorum* (Pitcher).
Erato	*Sallierii* and *hirsutissimum.*
Eros	*barbatum Warnerii* and *Charles Canham* (Wills).
Erycina	Syn. *Pitcherianum.*
Etienne Jolibois	*insigne Maulei* and *hirsutissimum* (Jolibois).
Etiocle	Syn. *Surprise.*
Eucharis	*insigne Chantinii* and *Lawrenceanum.*
Euphrosyne	Syn. *Adriadne.*
Euryades	*Leeanum* and *Boxallii* (Veitch).

Cypripedium—*continued.*

Euryale	*Lawrenceanum* and *superbiens* (Veitch).
Euryandrum	*barbatum* and *Stoneii* (Veitch).
Eurydice	*Hookeriæ* and *Spicerianum* (Graves).
Eurydice	*hirsutissimum* and *Leeanum* (Vuylsteke).
Eurylochus	*ciliolare* and *hirsutissimum* (Veitch).
Euterpe	*venustum* and *philippinense* (Statter).
Evenor	*concolor* and *Argus* (Veitch).
Excelsior	Syn. *Buchanianum* (Hye).
Excelsior	*Rothschildianum* and *Harrisianum* (Statter).
Eyermanniana	*barbatum grandiflorum* and *Spicerianum* (Sander).
Eyermanniana Diana	*barbatum superbum* and *Spicerianum magnificum* (R. H. Measures).
Eyermanniana Hermione	*barbatum Warnerii* and *Spicerianum* (Young).
Fairieano-Lawrenceanum	*Lawrenceanum* and *Fairieanum* (R. H. Measures).
Fairy Queen	*Curtisii* and *Druryii* (Sander).
Fascinator	Syn. *Ceres*.
Fausianum	*Dauthierii* and *calophyllum* (Sander).
Favager	*Charlesworthii* and *concinnum* (Rehder).
Felix Faure	*Godefroyæ* and *callosum* (Dellamagne).
Felix Jolibois	Syn. *œnanthum*.
festum	*chloroneuron* and *barbatum Warnerii* (Seeger).
Figaro	*Spicerianum* and *œnanthum* (Seeger).
Finetianum	*philippinense* and *ciliolare* (Seeger).
Finetianum	*Cardinale* and *caudatum* (Finet)
Fitchianum	*Hookeræ* and *barbatum* (Williams).
Flamingo	Syn. *Calypso*.
Flora	Syn. *Calypso*.
Fordianum	*Stoneii* and *callosum* (Sander).
Fortuna	*Hookeræ* and *callosum* (Young).
Fournierianum	*insigne Maulei* and *Lawrenceanum* (Sander).
Fowlerianum	*Harrisianum* and *bellatulum* (Sander).
François Peeters	Syn. *Charles Richman*.
Fraserii	*hirsutissimum* and *barbatum* (Veitch).
Frau Ida Brandt	*Io grande* and *Youngianum* (Sander).
Frederico Nobile	*Boxallii* and *Morganiæ* (Seeger).
F. S. Roberts	*niveum* and unknown (Low).
fulgens	*marmarophyllum* and *Hookeræ* (Sander).
Furzianum	*callosum* and *hirsutissimum* (Sander).
Gabrali	*orphanum* and *Dauthierii* (Gabral).
Galatea	Syn. *œnanthum*.
gandavense	*barbatum* and *Swanianum*.
Garbari	*Lawrenceanum* and *Rothschildianum* (Sander).
Garret A. Hobart	*Lathamianum* and *insigne Chantinii* (Roebling).
Gaskelliana	Syn. *Niobe*.
gemmiferum	*Hookeræ* and *purpuratum* (Veitch).
Genesa	*Sallierii Hyeanum* and *Lawrenceanum Hyeanum* (R. I. Measures).
George Kettle	*Dayanum* and *superbiens* (Kettle).
George Truffaut	*ciliolare* and *Stoneii* (Sander).
Georgianum	*superbiens* and *niveum* (Graves).
Germain Sciller de Gisors	Syn. *œnanthum*.
Germinyanum	*villosum* and *hirsutissimum* (Veitch).
Gertrude	Syn. *Miss L. Fowler*.
Gertrude Hollington	*ciliolare* and *bellatulum* (Hollington).
G. H. Rodgers	*insigne punctatum violaceum* and *superbiens* (Williams).
Gibezranum	Syn. *Measuresianum*.
giganteum	*Harrisianum* and *Sallierii Hyeanum* (Hye).
gigas	*Lawrenceanum* and *Harrisianum* (Ingram).
Gillianum	Syn. *Hera*.
gloriosum	Syn. *gigas*.
Godefroyæ	*bellatulum* and *niveum* (also nat. hyb.) (Strickland). See Fig. 301.
Godseffianum	*Boxallii* and *hirsutissimum* (Cookson).
Goultenianum	*Curtisii* and *callosum* (Goulten).
Gowerianum	*Curtisii* and *Lawrenceanum* (Sander).
gracile	*Haynaldianum* and *Swanianum* (Ingram).
grande	*Roezlii* and *caudatum* (Veitch).
Gravesiæ	*Argus* and *niveum* (Graves).
Gravesianum	*Lathamianum* and *Leeanum* (Sander).
Greyanum	*Druryii* and *ciliolare* (Pitcher).
G. S. Ball	Syn. *radiosum*.
Hardyanum	Syn. *macrochilum*.
Harri-Leeanum	*Harrisianum* and *Leeanum* (Clarke).
Harri-Sander	*Harrisianum* and *Sanderianum* (Clarke).
Harrisianum	*villosum* and *barbatum* (Veitch).
Harrisi-froyæ	*Harrisianum* and *Godefroyæ* (Lawrence).

Cypripedium—*continued.*

Harryanum	*Stoneii* and *Leeanum* (Backhouse).
Hayetti	Syn. *Ledouxiæ*.
Haynaldo-bellatulum	*Haynaldianum* and *bellatulum* (Clarke).
Haynaldo-Chamberlainianum	*Haynaldianum* and *Chamberlainianum* (Ashworth).
H. Ballantinæ	*purpuratum* and *Fairieanum* (Veitch).
Hebe	Syn. *Alice*.
Hecla	*superbiens* and *Swanianum* (Ingram).
Heloise Mantin	*gemmiferum* and *Boxallii* (Martin).
Helvita	*Chamberlainianum* and *philippinense* (Leeman).
H. E. Mojan	*Hookeræ volontianum* and *Harrisianum* (R. H. Measures).
Henri van der Straten	*Mrs. Canham* and *Leeanum* (Sander).
Henry Graves, jun.	*Lawrenceanum* and *Marshallianum* (Graves).
Hera	*Boxallii* and *Leeanum* (R. H. Measures).
Hermione	Syn. *Eyermanniana*.

FIG. 301. FLOWER OF CYPRIPEDIUM GODEFROYÆ LEUCOCHILUM.

Hero	*villosum* and *Boxallii*.
Hiero	*Chamberlainianum* and *Lawrenceanum* (Veitch).
highfieldense	*Lawrenceanum* and *Druryii* (Barton).
hirsuto-Sallierii	*hursutissimum* and *Sallierii* (Lawrence).
hirsuto-villosum	*hirsutissimum* and *villosum* (Cappi).
Hobsonii	*philippinense* and *callosum* (Hollington).
Hollidayanum	*concolor* and *almum* (Sander).
Hookerii-Veitchii	*Hookeræ* and *superbiens* (Williams).
Hornerii	Syn. *Cyris*.
Hornianum	*superbiens* and *Spicerianum* (Sander).
Hurrellianum	*Argus* and *Curtisii* (Pitcher).
Huybrechtsianum	Syn. *Ceres*.
hybridum	*villosum* and *barbatum*.
Iago	*Dayanum* and *villosum* (Wrigley).
I'Ansoni	*Morganiæ* and *Rothschildianum* (Low).
Ianthe	*Harrisianum* and *venustum* (Veitch).
imperatrix	*Ashburtoniæ expansum* and *calophyllum* (Sander).
imperiale	Syn. *Madam Jules Hye*.
Indra	*callosum* and *villosum* (R. I. Measures).
Ino	*Haynaldianum* and *Mrs. Canham* (Grey).
insigne-tonsum	*insigne* and *tonsum* (Sander).

Cypripedium—*continued.*

inspirator	Syn. *Madam Jules Hye.*
intermedium	Syn. *hybridum.*
inversum	*villosum* and *superbiens.*
Io	*Argus* and *Lawrenceanum* (Sander).
Iocasta	*Haynaldianum* and *insigne Chantinii* (Veitch).
Io grande	*Argus* and *Lawrenceanum* (Sander).
Ionides	Syn. *Behrensianum.*
Io-Spicerianum	*Io* and *Spicerianum* (Robins).
Iris	*javanico-superbiens* and *ciliolare* (Bleu).
Isabellicæ	*Spicerianum* and *niveum* (Williams).
Jacobianum	*Crossianum* and *bellatulum* (Le Roy).
James Buckingham	*enfieldiense* and *bellatulum* (Hollington).
Jamesonianum	*Leeanum* and *Arthurianum* (Statter).
Janet	*Spicerianum* and *glandaliferum* (Veitch).
Janet Ross	*Svanianum* and *Harrisianum* (Ross).
Janus	*Spicerianum* and *vexillarium* (R. I. Measures).
javanico-insigne	*javanicum* and *insigne* (Pitcher).
javanico-Spicerianum	*javanicum* and *Spicerianum* (Page).
javanico-superbiens	*javanicum* and *superbiens* (Bleu).
J. Bartels	*Boxallii* and *callosum* (Sander).
J. Coles	*Godefroyæ leucochilum* and *Dayanum* (R. H. Measures).
Jeanette	*niveum* and *Leeanum* (Charlesworth).
Jensenianum	*hirsutissimum* and *vexillarium* (Sander).
J. Gurney Fowler	*Godefroyæ* and *barbatum* (Low).
J. H. Berry	*Harrisianum superbum* and *concolor* (Sander).
J. Howes	*Sallierii* and *villosum* (Cobb).
J. H. Veitch	*Curtisii* and *Stoneii platytænium* (Veitch).
James K. Polk	*nitens* and *Chamberlainianum* (*Rœbling*).
John Carder	*Selligerum majus* and *hirsutissimum* (Sander).
Johnsonii	*nitens magnificum* and *Lawrenceanum* (Sander).
Jolien Coffegnez	Syn. *Ianthe.*
Joseph Donat	*Ashburtoniæ* and *Spicerianum* (Sander).
Josephianum	*Druryii* and *javanico-superbiens* (Pitcher).
Josephine Jolibois	Syn. *œnanthum.*
Juno	*Fairieanum* and *callosum* (Cookson).
Jupiter	Syn. *Godseffianum.*
Kaloc	*barbatum* and *Argus* (R I. Measures).
Kerchovianum	*Curtisii* and *barbatum.*
Kimballianum	*Rothschildianum* and *Dayanum* (nat. hyb.).
Kirchoffianum	*Dauthierii* and *Spicerianum* (Seeger).
Kramerianum	*œnanthum* and *villosum* (Sander).
Krishna	*insigne* and *tonsum* (Graves).
Krousianum	*Spicerianum* and *Crossianum* (Pitcher).
Lachesis	*Crossianum* and *marmarophyllum* (Young).
Lachmee	*ciliolare* and *superbiens* (R. I. Measures).
Lady Hutt	*insigne* and *Fitchianum* (Swinburne).
Lady Isabel	*Rothschildianum* and *Stoneii* (Sander).
Lady Maple	*Youngianum* and *Gowerianum* (Sander).
Lady Wimborne	Syn. *Leander.*
Laforcadei	*barbatum* and *insigne punctatum violaceum Godefroyæ.*
La France	*nitens* and *niveum* (Seeger).
La Nymphe	*œnanthum* and *Dauthierii* (Ingram).
Lathamianum	*Spicerianum* and *villosum* (Latham).
latiflorum	*venustum* and *philippinense* (Statter).
Laucheanum	*barbatum* and *insigne amabile* (Sander).
Lauriæ	*villosum* and *superciliare* (Le Doux).
Laure-bel	*Lawrenceanum* and *bellatulum* (Lawrence).
Lawre-concolor	*Lawrenceanum* and *concolor* (Sander).
Lawre-venustum	*Lawrenceanum* and *venustum.*
Lawrenceano-Curtisii	*Lawrenceanum* and *Curtisii* (Bleu).
Lawrenceano-Druryii	*Lawrenceanum* and *Druryii* (Veitch).
Lawrenceano-Fairieanum	*Lawrenceanum* and *Fairieanum* (R. H. Measures).
Leander	*Leeanum* and *villosum* (R. H. Measures).
Lebandyanum	*philippinense* and *Haynaldianum* (Page).
Leda	*Harrisianum* and *venustum* (Bowering).
Ledouxiæ	*callosum* and *Harrisianum* (Le Doux)
Leeanum	*insigne* and *Spicerianum* (Lawrence). See Fig. 302.
Leeanum-Galatea	*Leeanum* and *Galatea* (Sander).

Cypripedium—*continued.*

Leeanum-Morganiæ	*Leeanum* and *Morganiæ* (R. I. Measures).
Lemoinierii	*calurum* and *porphyreum* (Sander).
Leo	Syn. *Lathamiana* (Hye).
Leo	*Wallertianum* and *insigne Chantinii.*
Leoniæ	*insigne Chantinii* and *callosum* (Leon).
Leonides	Syn. *St. Mark.*
Leopoldianum	*Leeanum superbum* and *insigne* (Hye).
Leopoldianum	*Sallierii Hyeanum* and *hirsutissimum* (Vuylsteke).
lepidum	Syn. *Tautzianum.*
leucorrhodum	*Rœzlii* and *Schlimii albiflorum* (Veitch).
Leysenianum	Syn. *Chas. Richman.*
Lily	*niveum* and *bellatulum* (Keeling).
Lily Measures	*niveum* and *Dayanum* (R. H. Measures).
Littleanum	*Lawrenceanum* and *Dayanum* (nat. hyb.) (Little).
Lobengula	*insigne Chantinii* and *Harrisianum.*
Loewegrianum	*Spicerianum* and *Io grande* (Sander).
Loochrystianum	*Harrisianum* and *Hookeræ* (Vuylsteke).
Lord Derby	Syn. *W. R. Lee.*
Louisiæ	*Leeanum* and *Ashburtoniæ* (Le Doux).
Louryanum	*Ashburtoniæ* and *vernixium* (Sander).
Louryi	*insigne Chantinii* and *Harrisianum.*
Lowii-superbiens	*Lowii* and *superbiens* (Lawrence).

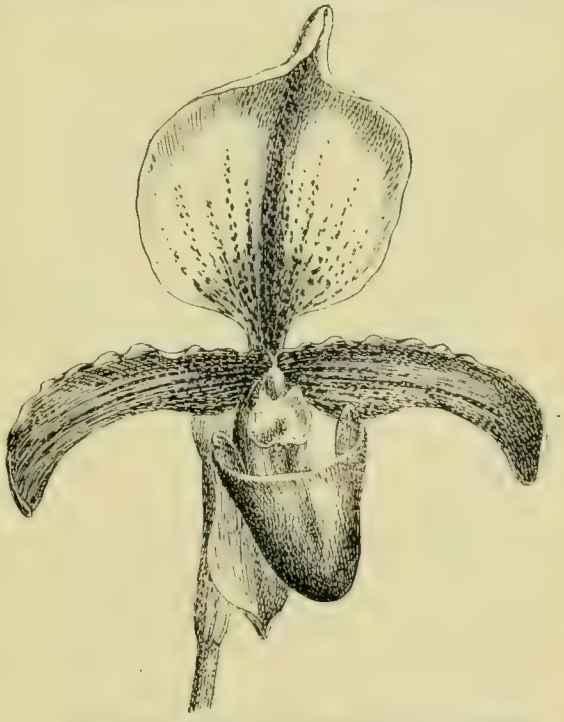

FIG. 302. FLOWER OF CYPRIPEDIUM LEEANUM SUPERBUM.

lucidum	*Lowii* and *villosum* (R. I. Measures).
Lucie	*Lawrenceanum* and *ciliolare.*
Lucienianum	Syn. *nitens.*
L'unique	*Lindleyanum* and *Schlimii albiflorum* (Ingram).
luridum	*Lawrenceanum* and *villosum* (Pitcher).
lutescens	*Spicerianum* and *javanicum* (Pitcher).
Lynchianum	*Spicerianum* and *selligerum majus* (Sander).
Mabeliæ	Syn. *W. R. Lee.*
Macfarlainei	*calophyllum* and *Spicerianum* (Sander).
MacNabbianum	Syn. *conco-callosum.*
macrochilum	*Roezlii* and *caudatum Lindenii* (Veitch).
macrochilum giganteum	*Grande* and *caudatum Lindenii* (Veitch).
macropterum	*Lowii* and *superbiens* (Veitch).

Cypripedium—*continued.*

maculatum ..... *tonsum* and *Leeanum* (Sander).
Madame Barbary ..... *Lawrenceanum* and *tonsum* (Jolibois).
Madame Cappi ..... *Spicerianum* and *Dauthierii* (Cappi).
Madame Cofinet ..... *superciliare* and *Dayanum* (Opoix).
Madame C. Goindoin .. Syn. *œnanthum.*
Madame de Curte ..... Syn. *Mons. de Curte.*
Madame Else Descombes *vernixum* and *Lawrenceanum* (Opoix).
Madame Emile Gayot .. *Harrisianum* and *insigne Chantinii.*
Madame Gabriel Moens *Spicerianum* and *callosum.*
Madame Gibez ..... *villosum* and *venustum.*
Madame Gondoin ..... Syn. *œnanthum.*
Madame G. Truffaut .. *ciliolare* and *Stoneii* (Sander).
Madame Jules Hye .... *Spicerianum* and *tonsum* (Hye).
Madame Louise Doin .. *purpuratum* and *insigne* (Opoix).
Madame Margaret Hye Syn. *Surprise.*
Madame Octave Opoix .. *superciliare* and *niveum* (Opoix)
Madame Paul Descombes *Dauthierii* and *Lawrenceanum* (Opoix).
Madame Roen Jolibois .. Syn. *œnanthum.*
Madame Van Houtte .. Syn. *Tautzianum.*
Mdlle. Jose Descombes .. *œnanthum* and *Argus* (Opoix).
Mdlle. Louise Sceller de Gisors ..... Syn. *Pitcherianum.*
Mdlle. Madeline Gayot *Dayanum* and *insigne Chantinii* (Jolibois),
Mdlle. Nancy Descombes *Argus* and *niveum* (Opoix).
Madeline ..... *bellatulum* and *Argus.*
Madiolianum ..... *villosum* and *Chamberlainianum* (Cappi).
Madouxianum ..... *œnanthum* and *Boxallii atratum* (Madoux).
Magnet ..... *insigne Chantinii* and *Boxallii.*
magnificum ..... *Pollettianum* and *insigne giganteum* (Keeling).
Mahlerœ ..... *Rothschildianum* and *Lawrenceanum* (R. H. Measures).
Malyanum ..... *Spicerianum* and *Crossii* (Sander).
Mansellii ..... *Chamberlainianum* and *villosum* (Charlesworth).
Marchioness of Salisbury Syn. *Charles Richman.*
Marguerite Mantin .... *Crossianum* and *barbatum Warnerii* (Mantin).
Maria ..... Syn. *Chamber-Leeanum.*
Marjorie ..... *Leeanum superbum* and *insigne* (Wigan).
marmarophyllum ..... *Hookerœ* and *barbatum* (Veitch).
Marriottianum ..... *Spicerianum* and *niveum* (Marriott).
Marshallianum ..... *venustum pardinum* and *concolor* (Veitch).
Marshallianum luteum . *concolor* and *venustum* (Graves).
Marshianum ..... *Lawrenceanum* and *œnanthum superbum* (Sander).
Marwoodii ..... *niveum* and *Harrisianum.*
Mary Lee ..... *Leeanum* and *Arthurianum* (Lee).
Masereelianum ..... Syn. *Leeanum.*
Masonianum ..... *villosum* and *Harrisianum superbum* (Sander).
Massaianum ..... *superciliare* and *Rothschildianum* (Sander).
Maurelianum ..... *Dauthierii* and *Spicerianum* (Black).
Mauricianum ..... Syn. *Pitcherianum.*
Maynardii ..... *purpuratum* and *Spicerianum* (Sander).
Measuresiæ ..... *superbiens* and *bellatulum* (Sander).
Measuresianum ..... *villosum* and *venustum* (Williams).
Medea ..... Syn. *Ceres.*
medium ..... *Druryii* and *Sallierii* (Hye).
Meirax ..... *venustum* and *barbatum* (Williams).
Melanopthalmum ..... *barbatum* and *venustum* (Williams).
Melanthum ..... *Hookerœ* and *Stoneii* (Veitch).
Meleona ..... Syn. *Madame Jules Hye.*
Memoria Moensii ..... *Spicerianum* and unknown (Moens).
Merops ..... *Druryii* and *ciliolare* (Veitch).
Meteore ..... Syn. *Chas. Richman.*
Metes ..... *philippinense* and *barbatum* (Veitch).
microchilum ..... *niveum* and *Druryii* (Veitch).
Milnianii ..... *philippinense* and *callosum* (Hollington).
Milo ..... *insigne Chantinii* and *œnanthum superbum* (Veitch).
Minerva ..... *elegans* and *venustum* (R. H. Measures).
miniatum ..... *Curtisii* and *insigne* (Sander).
Ministre A. Vigar .... *barbatum purpureum* and *superciliare* (Mantin).
Minnie Ames ..... *Curtisii* and *concolor* (Sander).
Minos ..... *Spicerianum* and *Arthurianum* (Veitch).
Minos ..... *Leeanum* and *insigne* (Statter).
Mira ..... *Harrisianum* and *Hookerœ* (Vuylsteke).
Miss H. A. Roebling .... *caudatum* and *leuchorrhodum* (Roebling).
Miss Louisa Fowler .... *insigne Chantinii* and *Chamberlainianum* (Fowler).

Cypripedium—*continued.*

Miss Minnie Ames .... Syn. *Minnie Ames.*
Miss Rehder ..... *Argus* and *hirsutissimum* (Rehder).
modestum ..... *Harrisianum* and *tonsum* (Graves).
molestum ..... *purpuratum* and *Io* (Sander).
Monsea ..... Syn. *Euryandrum.*
Mons. de Curte ..... *Boxallii* and *insigne Chantinii* (Vervaet).
Mons. Finet ..... *callosum superbum* and *Godefroyæ* (Reignier).
Monsitteanum ..... *superbiens* and *callosum* (Mantin).
Moreanum ..... *superciliare* and *callosum* (Reignier).

FIG. 303. FLOWER OF CYPRIPEDIUM MORGANIÆ.

Morganiæ ..... *superbiens* and *Stoneii* (Veitch). See Fig. 303.
Morganiæ Langleyense .. *superbiens* and *Stoneii platytænium* (Veitch).
Mrs. Caroline Allen .... *œnanthum superbum* and *callosum* (McArthur).
Mrs. Charles Canham .. *superbiens* and *villosum* (Veitch).
Mrs. C. Maynard ..... *nitens* and *Boxallii* (Sander).
Mrs. C. Warren Hook .. *Dauthierii* and *œnanthum superbum* (Pitcher).
Mrs. D. Solomon ..... *Lathamianum* and *Spicerianum* (Sander).
Mrs. Edgar Cohen ..... Syn. *calloso-niveum.*
Mrs. E. G. Uihlein .... Syn. *Leander.*
Mrs. E. V. Low ..... *niveum* and unknown (Low).
Mrs. F. Hardy ..... *superbiens* and *bellatulum* (Sander).
Mrs. F. L. Ames ..... *tonsum* and *Fairieanum* (Ames).
Mrs. G. Bollerall ..... *Lathamianum* and *Savageanum superbum* (McMeeking).
Mrs. G. D. Owen ..... *superciliare* and *villosum* (Sander).
Mrs. H. Druce ..... Syn. *Godefroyæ.*
Mrs. Harry Veitch .... Syn. *Antigone.*
Mrs. Plummer ..... Syn. *Mrs. C. Maynard.*
Mrs. Reginald Young .. *Lowii* and *Sanderiana* (Low).
Mrs. Rehder ..... *Argus* and *Rothschildianum* (Rehder).
Mrs. Tautz ..... *insigne Chantinii* and unknown (Tautz).
Mrs. W. A. Roebling .... *Sedenii candidulum* and *caudatum* (Roebling).
Mrs. W. Clark ..... *Ashburtoniæ expansum* and *Stoneii* (Clark).
multicolor ..... Syn. *Hornianum.*

Cypripedium—*continued.*

naulus	*Harrisianum* and *Lawrenceanum* (Sander).
Muriel Hollington	*niveum* and *insigne* (Hollington).
Murillo	Syn. *Cyris.*
Nandii	*callosum* and *Tautzianum* (R. I. Measures).
Nansen	*selligerum majus* and *Morganiæ* (Cookson).
nanum	*Leeanum giganteum* and *Lathamianum* (R. H. Measures).
Neptune	*Io grande* and *Rothschildianum* (Sander).
Niobe	*Spicerianum* and *Fairieanum* (Veitch).
nitens	*villosum* and *insigne* (Veitch).
nitens Leeanum	*nitens* and *Leeanum* (Sander).
nitidissima	*caudatum* and *conchiferum* (Veitch).
niveo-ciliolare	*niveum* and *ciliolare* (R. H. Measures).
niveo-Druryii	*niveum* and *Druryii* (Sander).
niveo-Lowii	*niveum* and *Lowii* (Drewett).
nobilior	*Haynaldianum* and *Lathamianum.*
Norma	*Niobe* and *Spicerianum* (Veitch).
Norrisianum	*purpuratum* and *Leeanum* (Rehder).
Northumbrian	*calophyllum* and *insigne Maulii* (Drewett).
Numa	*Stoneii* and *Lawrenceanum* (Veitch).
Oakes Ames	*Rothschildianum* and *ciliolare* (Sander).
obscurum	Syn. *Ashburtoniæ.*
Odette	*vernixium* and *Spicerianum* (Moens).
œnanthum	*Harrisianum* and *insigne Maulii* (Veitch).
Œnone	*Hookeræ* and *superbiens* (Veitch).
Œno-Spicerianum	*œnanthum* and *Spicerianum* (R. I. Measures).
Œno-superbiens	*œnanthum* and *superbiens* (Lawrence).
Olenus	*bellatulum* and *ciliolare* (R. I. Measures).
Olga Bagshaw	*œnanthum superbum* and *callosum* (Le Doux).
Olivet	*barbatum gracile* and *Swanianum* (Mantin).
Olivetense	*barbatum* and *Warnerii* (Mantin).
Olivia	*tonsum* and *niveum* (Ames).
Orestes	Syn. *œnanthum.*
Orion	*concolor* and *insigne* (Veitch).
Orion	*selligerum Myas* and *Rothschildianum* (Sander).
ornatum	*Harrisianum* and *villosum* (Hye).
orphanum	*barbatum* and *Druryii* (Veitch).
Orpheus	*venustum* and *callosum* (Sander).
Osborneii	Syn. *Pitcherianum.*
Pageanum	*superbiens* and *Hookeræ* (Seeger).
Pallas	*callosum* and *calophyllum* (Drewett).
Palleus	*Spicerianum* and *Dayanum* (Pitcher).
Pandora	*Argus* and *Dayanum* (Jolly).
Paris	*bellatulum* and *Stoneii* (R. H. Measures).
Parishii-Lowii	*Parishii* and *Lowii* (Linden).
Parksianum	*Boxallii atratum* and *nitens* (Parker).
Parksianum	*Spicerianum* and *marmarophyllum* (Pollett).
patens	Syn. *marmarophyllum.*
Patersonii	*Lowii* and *Dayanum* (Lewis).
Paulii	*selligerum* and *Harrisianum* (Bowering).
Pavonianum	*Boxallii* and *venustum* (Pitcher).
Peetersianum	Syn. *selligerum.*
Pegasus	*Leeanum* and *Morganiæ* (R. I. Measures).
Pelias	*Haynaldianum* and *insigne Chantinii* (Pitcher).
pellucidum	*insigne Maulei* and *Dayanum* (Pitcher).
pendulum	*Argus* and *philippinense* (Heath).
Perseus	*Sedenii porphyrum* and *Lindleyanum* (Veitch).
Phædra	*Lindleyanum* and *Sedenii candidulum* (Veitch).
Pheres	Syn. *Alcides.*
Phœbe	*philippinense* and *bellatulum* (Statter).
Picardianum	Syn. *Maynardii.*
picturatum	Syn. *Hornianum.*
Pitcherianum	*Harrisianum* and *Spicerianum* (Sander).
placidum	*Ashburtoniæ* and *insigne* (Bale).
platicolor	*concolor* and *Stoneii platytœnium* (Lawrence).
Plato	*Boxallii* and *calophyllum* (Low).
pleistochlorum	*barbatum* and *javanicum virens* (Drewett).
plumosum	*barbatum* and *œnanthum superbum* (Statter).
plunerum	*Harrisianum* and *venustum* (Williams).
politum	*barbatum* and *venustum* (Williams). See Fig. 304.
Pollettianum	*calophyllum* and *œnanthum superbum* (Sander).
polychromum	*politum* and *superbiens* (Clark).
polystigmaticum	*venustum* and *Spicerianum* (R. H. Measures).
Polythemis	*venustum* and *tonsum* (Graves).
porphyrochlamys	*barbatum* and *hirsutissimum* (Veitch).
porphyrospilum	*venustum* and *Lowii* (Veitch).
Poyntzianum	*callosum* and *Hookeræ* (nat. hyb.).
Prætus	*Boxallii* and *Haynaldianum* (Graves).
Prefect Boigner	*insigne* and *Uihleinianum* (Martin).
Premier	*beechense* and *Rothschildianum* (Sander).
Prewettii	*Harrisianum* and *villosum* (Hollington).
Prince Edward of York	*Rothschildianum* and *Sanderianum* (Gratrix).
Princess May	*callosum* and *Sanderianum* (Sander).
Prospero	Syn. *Leeanum.*
Pryorianum	*Lathamianum* and *Harrisianum* (Sander).
Psyche	Syn. *leucorrhodum.*
pulchellum	*grande* and *Sedenii candidum* (Vanner).
pulcherrimum	Syn. *œnanthum.*
pycnopterum	*venustum* and *Lowii* (Veitch).
Pygmalion	*villosum* and *ciliare* (Graves).

FIG. 304. FLOWER OF CYPRIPEDIUM POLITUM.

quies	*Hookeræ* and *Curtisii* (R. I. Measures).
radiosum	*Lawrenceanum* and *Spicerianum* (Veitch).
Raymond Farault	*Sedenii* and *caracinum* (Farault).
Refulgence	*Curtisii* and *hirsutissimum* (Ingram).
Regale	*insigne Maulii* and *purpuratum* (Bull).
Regina	*Leeanum* and *Fairieanum* (Veitch). See Fig. 305.
Regnaldianum	*insigne* and *callosum.*
Rehderianum	*Savageanum superbum* and *purpuratum* (Rehder).
Rene Jolibois	Syn. *œnanthum.*
Reynaldii	*villosum* and *Boxallii.*
Rhemba	*barbatum superbum* and *Godefroyæ* (R. I. Measures).
Rimus	*Bullenianum* and *purpuratum.*
Robertii	Syn. *Alcides.*
Robinianum	*Lowii* and *Parishii* (Linden).
Robinsonianum	*Lawrenceanum* and *superbiens* (Sander).
robustus	Syn. *calurum* (Sander).
Rodigasianum	Syn. *Maynardii.*
Roeblingianum	*Io* and *Boxallii* (Sander).
Rolfianum	*bellatulum* and *Rothschildianum* (Statter).
Romulus	*insigne Chantinii* and *nitens* (Hye).

Cypripedium—*continued.*

Cypripedium—*continued.*

Rossianum	*barbatum* and *tonsum* (Ross).
Rosy Gem	*cardinale* and *Sedenii* (Ingram).
Rothschildiano-Boxallii	*Rothschildianum* and *Boxallii* (R. I. Measures).
Rothschildiano-villosum	*Rothschildianum* and *villosum* (Veitch).
Rothwellianum	*Argus* and *Stonei* (Sander).
rotundum	*Lathamianum* and *purpuratum* (Keeling).
Rowalliana	*villosum* and *venustum* (Fraser).
Roweana	*Chamberlainiana* and *bellatulum* (R. H. Measures).
rubens	Syn. *bingleyense.*
rubescens	*œnanthum superbum* and *Boxallii* (Statter).
rubicundum	*Schlimii* and *Sedenii* (R. I. Measures).
rubrum	*venustum* and *Hookeræ* (Lewis).
Ruth Ayling	*niveum* and *Argus* (Hollington).

FIG. 305. FLOWER OF CYPRIPEDIUM REGINA.

Said Lloyd	*venustum* and *Godefroyæ* (Sander).
St. Hilda	*Boxallii* and *Curtisii* (Marwood).
St. Mark	*villosum* and *Leeanum* (Palmer).
Salis	*concolor* and *Dayanum* (R. I. Measures).
Sallierii	*villosum* and *insigne* (Sallier).
Samuel Gratrix	*bellatulum* and *Godefroyæ* (Gratrix).
Sanderiano-Curtisii	*Sanderianum* and *Curtisii* (Cookson).
Sanderiano-selligerum	*Sanderianum* and *selligerum* (Lawrence).
Sanderiano-superbiens	*Sanderianum* and *superbiens* (Cookson).
Sappho	*Lowii* and *barbatum* (Veitch).
Saron	*niveum* and *venustum Measuresianum* (R. I. Measures).
Saturn	Syn. *Leander.*
Saundersianum	*caudatum* and *Schlimii* (Bull).
Savageanum	*Harrisianum* and *Spicerianum* (Seeger).
Schlesingerianum	*Boxallii* and *insigne Maulii* (Seeger).
Schofieldianum	*bellatulum* and *hirsutissimum* (Schofield).
Schröderæ	*Sedenii* and *caudatum* (Veitch).

Cypripedium—*continued.*

Schusterianum	*Hookeræ* and *villosum* (Linden).
Scylla	*Dayanum* and *Boxallii* (Graves).
Sedenii	*Schlimii* and *longifolium* (Veitch).
Sedenii-candidulum	*Schlimii albiflorum* and *longifolium* (Veitch).
Seegerianum	*Spicerianum* and *Harrisianum* (Seeger).
selligero-barbatum	*selligerum* and *barbatum* (Joicy).
selligero-Harrisianum	*selligerum* and *Harrisianum* (Van Imschoot).
selligero-Rothschildianum	*selligerum* and *Rothschildianum* (Sander).
sellugerum	*barbatum* and *philippinense* (Veitch).
sementa	Syn. *javanico-superbiens.*
Senateur Montefiore	*marmarophyllum* and *Spicerianum* (Peeters).
Shipwayæ	*Dayanum* and *Hookeræ* (nat. hyb.).
siamense	*callosum* and *Bullenianum var. Appletonianum* (nat. hyb.).
Sibyrolense	*Boxallii* and *insigne* (Cahazic).
Siebertianum	*Dayanum* and *insigne.*
Siemonii	*superbiens* and unknown.
Simoni	*Leeanum* and *insigne Chantinii.*
Singtonianum	*vexillarium* and *barbatum Warnerii* (Sander).
Siraniacum	*Dayanum* and *barbatum.*
Sirans	*Godefroyæ* and *barbatum Crossii* (Veitch).
Sirius	Syn. *Ceres.*
Sir G. White	*Leeanum giganteum* and *concolor* (Schofield).
Sir R. Buller	*Smithii* and *insigne Chantinii* (Appleton).
Sir T. Lipton	Syn. *Olenus.*
Smeeanum	*Argus* and *Lathamianum* (Smee).
Smithii	*Lawrenceana* and *ciliolare* (Hollington).
Smithii Pretisa	Syn. *De Witt Smith.*
southgatense	*Harrisianum* and *bellatulum* (Lewis).
Souvenir de Madame Jules Dupré	Syn. *Pitcherianum.*
Souvenir de Roch Jolibois	*Lowii* and *Curtisii* (Opoix).
Sphinx	Syn. *Cyris.*
Spicero-Harrisii	Syn. *Pitcherianum.*
Spicero-hirsutissimum	Syn. *Ceres.*
Spicero-Lowii	Syn. *De Witt Smith.*
Spicero-niveum	*Spicerianum* and *niveum* (Sander).
Spicero-tonsum	Syn. *Madam J. Hye.*
Statterianum	*Spicerianum* and *vexillarium superbum* (Charlesworth).
Stella	*Schlimii* and *bellatulum* (*Lindleyanum*) (Sander).
stenophyllum	*Schlimii* and *caracinum* (Veitch).
striatum	*niveum* and *philippinense* (Ingram).
suffusum	*Lowii* and *Hookeræ* (Barton).
superciliare	*superbiens* and *barbatum* (Veitch).
Surprise	*Sallierii Hyeanum* and *Spicerianum* (Hye).
Svend Brunn	*Lowii* and *Curtisii* (Sander).
Swanianum	*Dayanum* and *barbatum* (Swan).
Swinburnii	*insigne Maulii* and *Argus* (Heath).
Sylvia	Syn. *Goweriі.*
Symondsiæ	*venustum* and *purpuratum* (Ross).
tacita	*Measuresianum* and *tonsum.*
Talisman	*Sallierii Hyeanum* and *Harrisianum superbum* (Hye).
Tautzianum	*barbatum* and *niveum* (Veitch).
Tautzianum lepidum	*barbatum Warnerii* and *niveum* (Bull).
T. B. Haywood	*Druryii* and *superbiens* (Veitch).
Telemachus	*Lawrenceanum* and *niveum* (Veitch).
tenebrosum	*Harrisianum nigrum* and *Boxallii atratum.*
tenellum	*magnifolium* and *Schlimii albiflorum* (Pitcher).
Tennyson	*œnanthum superbum* and *Dayanum* (McArthur).
tessellatum	*concolor* and *barbatum* (Veitch).
tessellatum porphyreum	*concolor* and *barbatum* (Veitch).
Thayerianum	*Lawrenceanum* and *Boxallii atratum* (Sander).
Thedore Bullier	*tonsum* and *villosum.*
The Duke	Syn. *Euryandrum.*
The Gem	*marmarophyllum* and *insigne Chantinii* (Ingram).
The Hendre	*barbatum Crossii* and *Lawrenceanum.*
The Pard	*superbiens* and *niveum* (Lawrence).
Themis	*insigne Maulii* and *Harrisianum superbum* (Veitch).
Thersites	*Sedenii* and *Lindleyanum* (Veitch).
Thetis	Syn. *Fitchianum.*
Thibautianum	*Harrisianum* and *insigne Maulii* (Veitch).
Thoorsianum	*hirsutissimum* and *superbiens* (Moens).
Thora	*politum* and *insigne Chantinii* (Veitch).
Thorntonii	*superbiens* and *insigne* (Mason).

Cypripedium—*continued.*

Thyadis	*superbiens* and *Chamberlainianum* (R. I. Measures).
Titanis	*Harrisianum* and *callosum* (R. H. Measures).
Titanum	*longifolium Hincksianum* and *Lindleyanum* (Sander).
Tityus	*œnanthum superbum* and *Spicerianum* (Veitch).
tonso-venustum	*tonsum* and *venustum* (Pitcher).
tonso-villosum	*tonsum* and *villosum* (Pitcher).
triangularis	*philippinense* and *venustum* (Sander).
triumphans	*œnanthum superbum* and *Sallierii Hyeanum* (Hye).
Troyanowskianum	*insigne Chantinii* and *Io grande* (Sander).
Tryonianum	*Harrisianum* and *superbiens* (Tate).
turpe	*barbatum* and *Argus* (Veitch).
T. W. Bond	*Lawrenceanum* and *hirsutissimum* (Ingram).
Uihleinianum	Syn. *Allanianum.*
Umlaufianum	*Lawrenceanum* and *insigne Chantinii* (Sander).
Unique	*Lindleyanum* and *Schlimii albiflorum* (Ingram).
Uranus	*Lindleyanum* and *grande* (Sander).
Urial	*Leeanum* and *javanicum* (Graves).
Vallerandii	Syn. *Leeanum.*
Vanderrielianum	Syn. *Calypso.*
Van Houtteanum	*niveum* and *Dauthierii* (Van Houtte).
Van Imschootianum	*callosum* and *insigne Chantinii* (Van Imschoot).
Van Molianum	*callosum* and *hirsutissimum* (Linden).
Vannerœ	*selligerum majus* and *Curtisii* (Vanner).
Vanninii	*Io grande* and *Lawrenceanum.*
Variety	*Spicerianum* and *ciliolare* (Marwood).
variopictum	Syn. *radiosum.*
Veitchi-Dauthierii	*superbiens* and *Dauthierii* (Opoix).
Veitchi-Morganiæ	*superbiens* and *Morganiæ* (Schofield).
Venus	*albanense* and *reticulatum* (Sander).
Venus	*niveum* and *insigne Sanderæ.*
vernixiodes	*Boxallii* and *javanicum* (Graves).
vernixium	*Argus* and *villosum* (Veitch).
Vervaeti	Syn. *Leeanum.*
Vervactianum	See *Euryale.*
Vesta	*Spicerianum* and *plunerum* (Sander).
Vesta	*vernixium* and *Harrisianum* (Veitch).
vexil-Io	*Io* and *vexillarium* (Cookson).
vexillario-bellatulum	*bellatulum* and *vexillarium* (Briggs-Bury).
vexillarium	*barbatum* and *Fairieanum* (Veitch).
Vibilia	*insigne* and *javanico - superbiens* (Graves).
villoso-œnantho	*villosum* and *œnanthum* (Ashworth).
villoso-Harrisianum	*villosum* and *Harrisianum.*
violaceum	Syn. *Germinyanum.*
Vipanii	*philippinense* and *niveum* (Vipan).
W. A. Allen	Syn. *Wallertianum.*
Wallertianum	*Harrisianum* and *villosum* (Peeters).
Warnero-superbiens	*barbatum Warnerii* and *superbiens* (Graves).
warnhamense	Syn. *Clinkaberryanum.*
Warocqueanum	Syn. *vexillarium.*
Watsonianum	*Harrisianum nigrum* and *concolor* (Sander).
Weathersianum	*Leeanum superbum* and *hirsutissimum* (Linden).
Weidlichianum	*longifolium Hartwegii* and *Schlimii* (Cookson).
Wendlandianum	*vernixium* and *Harrisianum* (Sander).
Wendlandianum	*œnanthum* and *venustum* (Charlesworth).
westonense	*Appletoniana* and *barbatum Warnerii* (Appleton).
Whitelyanum	*Boxallii atratum* and *Lawrenceanum* (Shaw).
Wiertzianum	*Rothschildianum* and *Lawrenceanum* (Linden).
Wiganæ	*Dayanum* and *barbatum Warnerii* (Wigan).
Wiganianum	*Hookerœ* and *Ashburtoniæ* (Wigan).
William Lloyd	*bellatulum* and *Swanianum* (Hollington).
William Trilease	*Rothschildianum* and *Parishii* (Sander).
Williamsianum	*villosum* and *Harrisianum* (Williams).
Wineqzianum	*Harrisianum superbum* and *Haynaldianum* (Linden).
Winifred Hollington	*ciliolare* and *niveum* (Hollington).
Winnianum	*villosum* and *Druryii* (Veitch).
woodlandense	*Dayanum* and *virens* (Sander).
Wottonii	*callosum* and *bellatulum* (R. I. Measures).
W. R. Lee	*superbiens* and *Rothschildianum* (Lee).
xanthophyllum	*Hookerœ* and *Mastersianum* (R. H. Measures).

Cypripedium—*continued.*

Ymir	*Hookerœ* and *Rothschildianum* (R. I. Measures).
Youngianum	*superbiens* and *philippinense* (Sander).
Zampa	*Leeanum superbum* and *hirsutissimum* (Vuylsteke).
Zeno	*insigne Chantinii* and *nitens* (Veitch).
Zeus	*callosum* and *ciliolare* (R. I. Measures).
Zuriago	*œnanthum superbum* and *Chamberlainianum* (Leeman).

CYRILLA (of L'Héritier). A synonym of **Achimenes** (which *see*).

CYRTANDRA (from *kyrtos*, curved, and *aner*, *andros*, a male; alluding to the curved filaments of the perfect stamens). ORD. *Gesneraceæ*. A genus embracing about sixty species of stove trees, shrubs, or sub-shrubs, natives of the Malayan Archipelago and the Pacific Islands. Flowers often whitish or yellowish, fascicled, capitate, or cymose in the axils; calyx free, five-cleft or somewhat five-parted; corolla sub-bilabiate; perfect stamens two; staminodes two or three, small; bracts small, or the outer ones ample. Leaves opposite, one often smaller, or by abortion nearly alternate. For culture of the two species introduced, *see* **Agalmyla.**

C. pendula (pendulous). *fl.* sessile; calyx brownish, ten to eleven lines long; corolla white, dotted purple on the lower side of the inflated part, 1½in. long, sub-equally five-lobed; peduncle about 6in. long, bent down. *l.* opposite, on long petioles, elliptic or elliptic-lanceolate, acute at apex, acute or sub-cordate at base, blotched grey above. Stem short and stout. Java, 1883.

C. Pritchardii (Pritchard's). *fl.* white, small, disposed in pedunculate, axillary, three-flowered cymes. *fr.* white, ovoid. *l.* petiolate, elliptic, obtusely toothed, acute at both ends, 5in. to 6in. long, 2in. to 2½in. broad. Fiji, 1837.

CYRTANDRACEÆ. Included under **Gesneraceæ** (which *see*).

CYRTANTHUS. SYNS. *Cyphonema, Eusipho, Gastronema, Monella,* and *Timmia.* According to J. G. Baker, this genus embraces about a score species, natives of the Cape of Good Hope and Angola. Flowers usually red or white, with green stripes, erect or pendulous; perianth tube twice or three times as long as the oblong segments; spathe-valves two to four, green, lanceolate; peduncle hollow. Leaves persistent, linear or lorate. To the species described on p. 428, Vol. I., the following should be added:

C. Galpini (Galpin's). *fl.*, perianth of a beautiful red tinged with yellow; tube cylindrical at base, broadly funnel-shaped above the middle; segments twice or thrice as long as the tube; scape very slender, one-flowered. August. Bulb ovoid, pale. Transvaal, 1892.

C. Huttoni (Hutton's). *fl.* six to eight in an umbel; perianth pale red, about 1in. long, the tube curved, narrowly funnel-shaped, twice as long as the segments; pedicels ½in. to 1in. long; peduncle 1ft. long. May. *l.* lorate, 1ft. long, ½in. to ¾in. broad. Cape Colony, 1864. (B. M. 7488.)

C. hybridus (hybrid). *fl.* light orange-scarlet or bright rosy-carmine. In general appearance this bigeneric hybrid between *C. sanguineus* and *Vallota purpurea* resembles the latter parent, but the perianth tube is bent forward and rather abruptly dilated in the throat, and the segments are rather narrower. The stamens are short, and the upper ones are curved downwards exactly as in *C. sanguineus.* 1885.

C. intermedius (intermediate). A garden hybrid between *C. Mackenii* and *C. angustifolius.*

C. lutescens, of gardens. A synonym of *Anoiganthus breviflorus.*

C. lutescens Cooperi (Cooper's). *fl.* more numerous than in the type; perianth segments more spreading; pedicels and spathe-valves longer. (B. M. 5374, under name of *C. lutescens.*)

C. Mackenii is the correct spelling of *C. M'Kenii.*

C. O'Brieni (O'Brien's). *fl.* bright scarlet, about eight in an umbel; perianth 1½in. long. *l.* contemporary with the flowers, linear. South Africa, 1894. An interesting species, intermediate between *C. angustifolius* and *C. Macowani.*

C. odorus (odorous). *fl.* bright red, fragrant, 2in. long, four to ten in an umbel; peduncle slender, 6in. to 12in. long. July and August. *l.* two or three, linear, straight, 1ft. long. Bulb ovoid, 1½in. in diameter. 1818. (B. R. 503.)

C. parviflorus (small-flowered). *fl.* ten to twelve in an umbel; perianth bright scarlet, sub-cylindric, 1in. to 1¼in. long; scape terete, as long as the leaves. January. *l.* produced with the flowers, linear, 1ft. long. Port Elizabeth, 1891. SYN. *Monella parviflora.*

Cyrtanthus—*continued.*

C. Smithianus (Smith's). *fl.* white, striped with green or reddish-brown, 3½in. to 4in. long; tube gradually dilated to a throat 1in. in diameter; umbel one- or two-flowered; peduncle 6in. long. May. *l.* two or four, linear, spirally twisted, 6in. to 9in. long. Kaffraria, 1876.

C. spiralis (spiral). *fl.* tubular, pendent, disposed in umbels, the six corolla segments of a bright red and almost triangular. *l.* long, ribbon-like, spirally twisted, glaucous-green. South Africa. A rare and very curious species. (G. C. 1897, ii., p. 303, f. 89.)

C. Tuckii (Tuck's). *fl.* yellowish at the base, passing upwards into blood-red, 1½in. to 2in. long, ten to twelve in an umbel; perianth tube curved, narrowly funnel-shaped, the segments oblong, ¼in. long; peduncle 1ft. to 1½ft. long. July. *l.* two, linear, 1ft. to 1½ft. long. Bulb 1½in. in diameter, the neck produced. Cape Colony, 1884.

CYRTANTHUS (of Schreber). A synonym of **Posoqueria** (which *see*).

CYRTOCERAS. The correct name of *C. multiflorum* is *Hoya multiflora.*

CYRTOCHILUM. This genus is now included, by Bentham and Hooker, under *Oncidium.* To the species described on p. 428, Vol. I., the following should be added:

C. detortum (distorted). *fl.*, sepals light brown, cuneate-oblong, acute, wavy, the odd one with a little yellow at the upper part; petals yellow, spotted brown, wavy; lip three-cleft, the side laciniæ spreading, triangular, and the mid-lacinia ligulate, acute; peduncle very strong, twisted. *l.* broad-oblong, acute, light green.

C. lutescens (yellowish). *fl.*, dorsal sepal dark brown, with a yellow, recurved margin, much waved at the edge, the stalk very short, with auricles, the lateral sepals greenish-brown, acute, longer-stalked; petals with a crisped, yellow limb; lip dark greenish, ligulate, short, the anterior part purple; column greenish, orange, and brown. 1837.

C. micranthum (small-flowered). *fl.* smaller than in *C. maculatum* (which this species resembles); sepals and petals greenish, spotted; lip white, with two brown blotches, yellow on the anterior part. Brazil, 1836.

CYRTOGONIUM. *See* **Acrostichum.**

CYRTOMIUM. *See* **Aspidium.** *C. caryotideum* is a variety of *A. falcatum*, and *C. Fortunei* is identical with *A. f. Fortunei.*

CYRTONEMA. A synonym of **Kedrostis** (which *see*).

CYRTOPERA (from *kyrtos*, curved, and *pera*, a small sack: in allusion to the sack-like appendage to the lip). ORD. *Orchideæ.* A genus embracing a few species of stove or greenhouse, terrestrial Orchids, mostly natives of Asia and Africa, nearly allied to *Cyrtopodium*, from which they differ in the lateral sepals being wider at the base and connate with the foot of the column, and in the simple inflorescence. Flowers generally showy, in erect spikes springing from the root. Leaves long, thin, plaited, dark green. Stems short or elongated. For culture, *see* **Cyrtopodium.**

C. flava (yellow). The correct name of *Cyrtopodium flavum.*

C. flexuosa (bending). *fl.* white, with purple spots and a yellow blotch on the lip; scape 1ft. long, flexuous. *l.* four, linear, flaccid, nearly 1ft. long. Pseudo-bulbs ovoid, ¾in. long. Eastern tropical Africa, 1894.

C. papillosa (papillose). *fl.* yellow, with some purplish-brown on the side lobes of the lip, about 1in. across; scape 2ft. high, bearing a few flowers. *l.* lanceolate, about 1ft. long. Natal, 1893. (L., t. 371.)

C. Regnieri (Regnier's). *fl.* yellow, large; sepals and petals falcate-lanceolate, acute; lip oblong-lanceolate, with a wide, blunt angle on each side at the middle; spur conical; raceme on a tall peduncle arising from the side of the leafy shoot. *l.* oblanceolate. Cochin China, 1886.

C. sanguinea (blood-coloured). The correct name of *Cyrtopodium sanguineum.*

C. Woodfordii (Woodford's). *fl.* yellow, with a purple lip; petals oblong, connivent, shorter than the acute sepals; scape radical, 1½ft. to 3ft. high, many-flowered. *l.* lanceolate, plicate, 8in. to 18in. long, spreading. Stem fusiform, fleshy. Tropical America, 1819. SYN. *Cyrtopodium Woodfordii* (B. M. 1814; B. R. 1503).

C. plicata and *C. squalida* are in cultivation at Kew.

CYRTOPODIUM. This genus embraces upwards of a score species of stove, terrestrial Orchids, inhabiting tropical Asia, Africa, and America. Sepals free, spreading, sub-equal, or the lateral ones broader at base and more or less decurrent into the foot of the column; petals similar to the dorsal sepal, but rather broader and shorter; lip affixed to the base of the column, the chin more or less prominent, the lateral lobes rather broad, the middle one rounded, entire, two-lobed, or crisped-toothed. Leaves long. To the species described on p. 428, Vol. I., the following should be added. *See also* **Cyrtopera** (which is included hereunder by Bentham and Hooker).

C. Aliciæ (Alicia's). *fl.* 1½in. in diameter; sepals and petals green, with brown spots; lip white, with crimson spots, three-lobed, the crest yellow; scape tall, branched, many-flowered. *l.* long, linear-lanceolate. Pseudo-bulbs large, fusiform. Brazil, 1893. (L. viii., t. 371.)

C. Andersonii cardiochilum (cordate-lipped). *fl.* bright yellow, tinged green, nearly 2in. across; lip recurved, the front lobe concave; raceme long, erect, forked at base; scape tall, springing from the root, quite distinct from, and taller than, the leafy stems. (W. O. A. iv. 176.)

C. cardiochilum (cordate-lipped). A variety of *C. Andersonii.*

C. flavescens (yellowish). *fl.* yellow, numerous, produced before the leaves, on a scape 3ft. high. Venezuela, 1895. This species is allied to *C. Andersoni.* (L. x., t. 84.)

C. punctatum splendens (splendid).* *fl.* small, freely produced in tall, branching racemes, and, as well as the upper bracts, coloured yellow, brown, and red. 1893. A pleasing variety, very much in the way of *C. Saintlegerianum.*

C. Saintlegerianum (Saint Leger's). *fl.*, sepals very pale yellow, blotched brown; petals the same colour, with very few spots at the base; lip sulphur, spotted brown, low, rather short, the side laciniæ broad, oblong, margined brown, the middle one small, obtriangular, retuse; column yellow; inflorescence about 2in. long; bracts small. Paraguay, 1885.

C. sanguineum. The correct name is *Cyrtopera sanguinea.*

C. virescens (greenish). *fl.* pale primrose-yellow, blotched with dark red, about 1in. in diameter; sepals ovate, acute; petals rounded; lip fleshy, shortly clawed, the lateral lobes dark red; raceme 1ft. to 2ft. high, many-flowered; scape 2ft. to 4ft. high. December. *l.* narrow-lanceolate, about 1ft. long. Pseudo-bulbs tufted, 3in. to 4in. long, pale green, with narrow purple rings. Brazil, 1893. (B. M. 7396.)

C. cristatum is in cultivation at Kew.

CYRTOSIA. A synonym of **Galeola** (which *see*).

CYRTOSPERMA (from *kyrtos*, curved, and *sperma*, a seed; the seeds are sometimes reniform). ORD. *Aroideæ.* A genus embracing about sixteen species of stove, perennial herbs, with tuberous or elongated rhizomes, inhabiting tropical Asia, Africa, and America. Flowers all fertile on an inappendiculate spadix; spathe ovate-lanceolate or oblong, convolute towards the base, at length opening, the lamina straight or twisted; spadix shorter than the spathe, sessile or stipitate, cylindrical or globose. Leaves hastate; petioles elongated, sheathing at base. The few species introduced require similar culture to that recommended for **Alocasia.**

C. ferox (fierce). *fl.*, spathe greenish-white; scape prickly. *l.* sagittate, borne on prickly petioles. Borneo, 1892. A remarkable species. (I. H. xxxix., t. 153.)

C. Johnstoni (Johnston's). The correct name of the plant described on p. 50, Vol. I., as *Alocasia Johnstoni.*

C. senegalense (Senegalese). *fl.*, spadix dark violet-purple, shortly stipitate, 2in. to 6in. long, ½in. to ¾in. thick; spathe 1ft. to 1½ft. long, oblong-lanceolate, long-acuminate, dull green clouded with red outside, within pale yellow-purple with interrupted bands of maroon-brown. March to May. *l.* 1ft. long, sagittately oblong; nerves many; petioles 3ft. to 4ft. high, sparsely prickly. Upper Guinea, 1897. (B. M. 7617.)

CYRTOSTACHYS. Flowers small, in spirally disposed clusters of three, a female between two males; spathes two, complete, caducous; spadix intrafoliolar, shortly pedunculate, broadly paniculately branched; branches 1ft. to 2ft. long, stout, spreading. Fruit small, ovoid. Leaves pinnatisect; leaflets linear-lanceolate, acuminate, one-ribbed. To the species described on p. 428, Vol. I., the following should be added:

C. Lakka (native name). *fr.* conico-ovoid, ¾in. long, narrowed to the tip. *l.* about 4ft. long; leaflets about 20in. long, 1¼in. broad, the upper ones shorter, obtuse or toothed, green above, ashy-grey beneath; sheath red. Singapore. SYN. *C. L. singaporensis.*

C. ferox (I. H. xxxix., p. 153) has also been introduced.

FIG. 306. FROND OF CYSTOPTERIS BULBIFERA

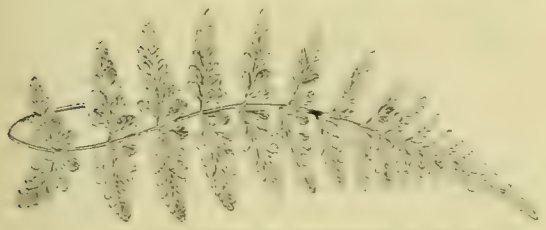

FIG. 307. FROND OF CYSTOPTERIS FRAGILIS.

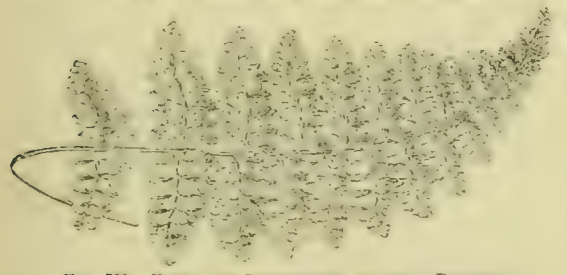

FIG. 308. FROND OF CYSTOPTERIS FRAGILIS DICKIEANA.

FIG. 309. FROND OF CYSTOPTERIS MONTANA.

CYSTOPTERIS. This small genus is interesting, inasmuch as, with the exception of the essentially North American *C. bulbifera* (Fig. 306), all others are indigenous to this country and well adapted for planting in the outdoor Fernery, where shady and well-drained spots should be selected for them, all being found growing naturally at high elevations. *C. fragilis* (Fig. 307) is a common British Fern; while the distinct form, *C. f. Dickieana* (Fig. 308), found by Dr. Dickie near Aberdeen, is by some botanists regarded as of specific rank. *C. montana* (Fig. 309) is provided with underground creeping rhizomes, but all the other Cystopterises produce their slender fronds in great abundance, either from a closely-tufted crown or from shortly-decumbent rhizomes. On account of their delicate appearance, all are well adapted for pot-culture, either under glass, in a cold frame, or without glass protection, in a sheltered position. All the known species and varieties lose their fronds early in the autumn and remain dormant until about April, during which period their crowns must not be allowed to get completely dry. When planted out, a compost of about equal parts fibrous peat, loam, and leaf-mould is the one which suits all Cystopterises best. For pot-culture it is advisable to add to this mixture a small proportion of old, crumbled mortar or broken limestone, and also to pay special attention to the drainage.

The Bladder Ferns are usually propagated during March and April by division of the crowns, wherever more than one has formed; they are also easily raised from spores sown in autumn in a cold frame. *C. bulbifera*, however, is more readily increased by means of the bulbils produced along its rachises, which, having fallen to the ground, soon emit a few slender roots and send up some rudimentary fronds, producing perfectly-developed foliage during the second year.

C. Bergiana (Berg's). A synonym of *Hypolepis Bergiana.*

C. spinulosa (slightly spiny). A synonym of *Asplenium spinulosum.*

C. tenuis (slender). A synonym of *C. fragilis.*

CYSTORCHIS (from *kystis*, a bladder, and *Orchis*). ORD. *Orchideæ.* A small genus (two or three species) of stove, terrestrial, Malayan Orchids. Flowers small, spicate, sub-erect. Leaves petiolate, ovate. *C. javanica* (B. H. 1862, t. 1, f. 1) and *C. variegata* (B. H. 1862, t. 1, f. 5) are in cultivation at Kew, but are of little horticultural value.

CYTHEREA. A synonym of **Calypso** (which *see*).

CYTINACEÆ. A natural order embracing about twenty-two species of broadly dispersed, parasitic, fleshy herbs, of botanical interest, ranking between the *Nepenthaceæ* and the *Aristolochiaceæ*; in some cases they are stemless and consist of flowers only, supported by scales in lieu of leaves, the flowers in *Rafflesia* reaching gigantic proportions.

CYTISUS. Including *Spartothamnus.* The hardy Cytisuses are very accommodating plants, thriving well in rough, turfy loam, but most of the kinds grow freely in dry, sandy soil. Cuttings of half-ripened shoots, dibbled in light soil and placed in a warm propagating-case, root readily. Layering is a quick method of increasing the stock; it should be performed in summer. The dwarf-growing sorts are admirably adapted for rockeries. When planted in dry soils the flowers of *C. purpureus* are light purple, but when grown in damp situations they are deep purple, and much more enduring.

To the species described on pp. 429-30, Vol. I., the following should be added. Several species formerly included here are now referred to **Adenocarpus** and **Genista.**

C. albus multiflorus (many-flowered).* A proliferous garden variety. 1888.

C. Alschingeri (Alschinger's). *fl.* of a pale yellow, freely produced, some of the racemes measuring 1½ft. in length. Croatia. Very floriferous. It is doubtful whether the plant generally cultivated under this name is the true *C. Alschingeri.*

C. Anagyris (Anagyris). A synonym of *Adenocarpus hispanicus.*

C. Andreanus (André's).* A beautiful and distinct variety of the common Broom (*C. scoparius*), having deeper golden flowers, with bright red keels instead of yellow. Found wild in Normandy, 1886. (R. G. 1342; R. H. 1886, p. 372, under name of *Genista Andreana.*)

C. candicans (whitish). *fl.* yellow, in terminal heads, not very numerous. May to July. *fr.* hirsute-villous. *l.* petiolate,

Cytisus—*continued.*

trifoliolate; leaflets obovate, appressedly pubescent. *h.* 6ft. to 9ft. Italy, Orient, &c., 1735. SYN. *Genista candicans* (W. D. B., t. 80).

C. decumbens (decumbent). *fl.* yellow, axillary, erect, long-pedunculate; corolla glabrous. June to August. *fr.* villous. *l.* ovate-oblong, slightly villous beneath. Stem diffuse-prostrate; branches angled, striated, slightly villous. Hungary, &c. SYN. *Genista prostrata.*

C. filifer (thread-bearing). A synonym of *Genista sibirica filifer.*

C. fragrans (fragrant). *fl.* white, very sweet-scented, laterally fascicled. May. *l.* very few, petiolate; leaflets lanceolate, pilose. Branches terete, striated. *h.* 6ft. Teneriffe, 1779. SYN. *Spartium nubigenum.*

C. glabrescens (nearly glabrous). *fl.* bright yellow, axillary, crowded, produced from the same bud with the bundles of leaves, on stalks four times as long as the calyx. May. *l.* having their under-sides and petioles covered with appressed hairs. Stems diffuse. Mountains of Northern Italy, 1896. A small bush.

C. kewensis (Kew).* *fl.* creamy-white, scented, disposed in racemes 1ft. to 1½ft. long, standard large. May. *l.* trifoliolate; petioles (and young branches) softly pubescent. 1896. A pretty and interesting hybrid between *C. Ardoini* and *C. albus*, raised at Kew.

C. linifolius (linear-leafleted). *fl.* yellow, crowded in terminal racemes. January to June. *fr.* hairy. *l.* sessile, trifoliolate, leaflets linear, silky beneath, the margins revolute. South Europe, North Africa, &c., 1739. SYN. *Genista linifolia* (B. M. 442).

C. nigricans Carlieri (Carlier's). This variety continues its growth after the formation of the first set of pods, so that it bears fruits and flowers at the same time. 1891.

C. n. nana (dwarf). A synonym of *C. capitata.*

C. præcox (early).* *fl.* creamy-yellow, produced in great abundance; habit compact. May. A hybrid between *C. purgans* and *C. albus.*

C. purgans (purging). *fl.* yellow, glabrous, axillary, solitary, shortly pedicellate. June and July. *fr.* pubescent when young. *l.* very few, lanceolate, sub-sessile, slightly silky. Branches terete, striated. *h.* 3ft. to 4½ft. France, &c. (B. M. 7618.) SYN. *Genista purgans.*

C. schipkaensis (Shipka Pass). *fl.* white. *h.* 1ft. Balkan Mountains, 1892.

C. supinus (supine), of Crantz and Jacquin. A synonym of *C. biflorus.*

DABŒCIA. This genus embraces only one species—*D. polifolia*, described on p. 430, Vol. I. Seeds should be sown as soon as they are ripe in shallow pans of peaty soil, barely covering them with finely-sifted soil, and placed in a cold frame, or, better still, in a warm greenhouse. The seeds should be sown thinly, and when the seedlings are large enough should be pricked off into boxes of rough peat and leaf-mould, and stood in cold frames, and if never allowed to suffer for water they will be fit for planting out in their permanent quarters the following spring. The following variety is now grown:

D. cantabrica (Cambridge). A synonym of *D. polifolia.*

D. polifolia calyculata (having a large calyx). A very pretty garden variety, producing both white and red flowers, the calyx being so developed as to give the appearance of double blossoms. 1891.

DACRYDIUM. SYN. *Lepidothamnus.* The ten species comprised in this genus are distributed over the Malayan Archipelago and Peninsula, the Fiji Islands, New Caledonia, New Zealand, Tasmania, and Chili. To those described on p. 430, Vol. I., the following species (grown in the Kew Arboretum) should be added:

D. araucaroides (Araucaria-like). *l.* spirally disposed, imbricated, coriaceous, adnate at base, the remaining part free, erecto-incurved, oval-oblong, rounded at apex, convex-keeled at back. Branchlets thick, erect. New Caledonia. A much-branched tree.

D. Colensoi (Colenso's). *l.* variable, some linear and spreading, ¼in. to ½in. long, obtuse, with stout costa, others densely quadrifariously imbricated, triangular, keeled, coriaceous, $\frac{1}{10}$in. to $\frac{1}{15}$in. long. Bark whitish or pale brown with white patches. *h.* 12ft. to 40ft. New Zealand.

D. tetragonum (four-angled). A synonym of *Microcachrys tetragona.*

DACTYLANTHES. Included under **Euphorbia** (which *see*).

DACTYLICAPNOS. Included under **Dicentra** (which *see*).

DACTYLIS CÆSPITOSA. A synonym of **Poa flabellata** (which *see*).

DACTYLOPHYLLUM (of Bentham). Included under **Gilia** (which *see*).

DACTYLOPIUS. A genus of Scale Insects, of which *D. adonidum* and *D. destructor* are found upon numerous greenhouse subjects; and *D. longifilis* upon Ferns and *Euphorbiaceæ.* *See* **Scale Insects.**

DACTYLOSTYLES. A synonym of **Zygostates** (which *see*).

DÆDALACANTHUS (from *dædalos*, of various colours, and *Acanthus*, to which it is related). SYN. *Eranthemum* (in part). ORD. *Acanthaceæ.* A genus comprising fourteen species of stove, erect, glabrous or pubescent shrubs or sub-shrubs, natives of the East Indies and the Malayan Archipelago. Flowers blue, pink (or white?), sessile in the axils of opposite bracts, bibracteolate, forming dense or interrupted spikes; calyx deeply five-lobed or five-parted; corolla tube elongated, slender, incurved above, the limb oblique, spreading, five-lobed; perfect stamens two. Leaves entire or scarcely toothed. *D. macrophyllus* is an erect, minutely pubescent, stove, perennial herb. "It belongs to a class of Acanthaceous plants that are very suitable for winter decoration, flowering freely under proper treatment, which consists very much in careful watering at the time when, in their native country, little or no rain falls" (Sir J. D. Hooker). For culture, *see* **Eranthemum.**

D. macrophyllus (large-leaved). *fl.*, calyx minute; corolla pale violet-blue, 1¼in. to 1½in. long, the limb about ⅔in. in diameter; spikes long-pedunculate, strict, erect, ⅔in. long, narrow; bracts ¼in. to ⅔in. long, loosely imbricated. Winter. *l.* petiolate; lower ones 5in. to 9in. long, elliptic-lanceolate, acuminate, the base decurrent on the petiole, the margins sometimes obscurely serrulate or denticulate. *h.* 2ft. to 3ft. Birma. (B. M. 6686.)

D. nervosus (nerved). The correct name of *Eranthemum pulchellum.*

DÆMONOROPS. The following species, described under *Calamus*, should be transferred to *Dæmonorops*, which is now regarded by botanists as a distinct genus: *C. accedens* (*D. Draco*), *C. adspersus*, *C. Draco*, *C. fissus*, *C. Hystrix*, *C. Jenkinsianus*, *C. Lewisianus*, and *C. verticillaris.* To the species described on pp. 430-1, Vol. I., the following should be added.

D. calicarpus (beautiful-fruited). *fl.*, male spadix 6in. to 16in. long, much-branched; female 4in. to 8in. long; outer spathe 12in. to 16in. long. *fr.* tawny, ⅔in. in diameter. *l.* 6ft. to 8ft. long, the upper ones small; leaflets very numerous, bristle-pointed, 12in. to 13in. long; petioles 1ft. long, with erect spines. Stem erect or somewhat climbing. Malaya.

D. grandis (large). *fl.*, spathe rather thick-fusiform; spadix branches shortened, compact. *l.*, pinnæ equidistant, glaucous, linear-lanceolate, acuminate, unarmed or the margins and keel slightly bristly; petioles gibbous at base. Malacca.

D. intermedius (intermediate). *fl.*, spadix thyrsiform; outer spathe 1½ft. long, the beak twice as long as the body. *l.* 4ft. to 6ft. long; leaflets opposite or scattered, 18in. to 20in. long, 1in. to 1½in. broad, linear-lanceolate, acuminate; petioles 1ft. long, armed with scattered spines. Stem 15ft. to 20ft. high, ⅔in. in diameter. Malaya.

D. longipes (long-stalked). *fl.*, spadix very long, on a long peduncle; spikes 3in. to 5in. long; spathes narrow-lanceolate, scurfy when young. *l.* about 12ft. long; leaflets linear-lanceolate or ensiform, subulate-acuminate, 12in. to 14in. long, 1¼in. broad; petioles convex below and armed with long, irregular spines. Malaya.

D. trichrous is in the Kew Collection, but is not in general cultivation.

DAGGER MOTH. *See* **Pear Insects.**

DAHLIA. These plants are gross feeders, and require a rich, deep soil, if blossoms are to be fully developed. It ought, moreover, to be trenched about 2ft. deep, and during the process a good supply of rich farmyard manure worked in. Trenching should be done in the previous autumn, before the ground is saturated with the autumn rains. In fine weather in winter the surface should be forked over to a depth of 3in. or 4in.; this will allow the air to penetrate more fully into the soil, getting it into the very best condition for planting in the season. At planting-time it is best to put the permanent sticks into the ground. If the soil is in good condition, sufficient should be dug out in front of the sticks to allow of the ball of the roots to go well into the soil. The plants should be firmly inserted, and tied to the sticks at once. If the soil is not in good condition, it is an excellent plan to dig out a spit or two, and

Dahlia—*continued.*

replace it with some prepared soil, such as would be used in re-potting the plants. In favourable weather they will soon grow away vigorously, when all the side-growths ought to be removed except four. These should not be tied up in a bundle—each should have a separate stick to support it; then by careful training a very handsome plant will be produced. As the growths advance they must be tied to the sticks, and the earlier ties must be seen to, as they have a tendency to cut into the succulent growths. When hot, dry weather sets in, water must be applied very freely to the roots, and a mulch of decayed manure will prevent the moisture from too rapidly evaporating. If the very finest blossoms are required for exhibition, it is necessary to shade some of the varieties. Cardboard caps may be put over the flowers, and held in position by a stout stick driven into the ground. To guard against such blossoms being injured by thrips they may be enclosed in a muslin bag.

To the species and varieties described on pp. 432-7, Vol. I., the following should be added:

D. arborea (tree-like). A synonym of *D. excelsa anemonæflora.*

D. excelsa anemonæflora (Anemone-flowered). *fl.-heads* 4in. across; ray florets soft lilac, flat; disk of lilac or yellow, tubular florets. *l.* large, bipinnate; petioles broadly connate. *h.* 12ft. to 20ft. Mexico, 1883. This variety requires to be grown in a cool conservatory. (B. ii. 88; G. C. n. s., xix., p. 60.) SYN. *D. arborea.*

D. gracilis. There are a number of varieties, including *cuprea* (coppery-red), *flore-pleno* (double-flowered), *fulgens* (crimson-scarlet), *ignea* (bright orange), *lutea* (pale yellow), and *superba* (crimson-scarlet, G. C. 1881, xvi., p. 584).

D. Yuarezii. *See* **D. Juarezii.**

D. Zimapani (native name). This is now the correct name of *Bidens atrosanguinea.* SYN. *Cosmos diversifolius atrosanguineus.*

FIG. 310. FLOWER OF SHOW DAHLIA GLOIRE DE LYON.

Varieties. Since the publication of this work proper, some considerable improvement has been wrought in the different sections of the Dahlia recognised by florists. The Pompon and Cactus sections, however, show the greatest advance; while the Singles, at one time so popular, have had to give place to the other sections. The following is a selection of varieties in the different sections. Following the plan of the work, we keep the Show and the Fancies distinct, though, as a matter of fact, the only difference lies in the flowers of the former being self-coloured or practically so; while those of the latter are made up of two or more colours in association.

Show Varieties. AGNES, pure yellow, excellent; ALICE EMILY, nankeen-yellow, good habit; BENDIGO, purple and crimson, fine; CHAMPION ROLLO, deep orange, shaded; CHIEFTAIN, purplish-lilac, large; CLARA, rosy-peach, large; COLONIST, chocolate and fawn; CORONET, dark red, large, good; CRIMSON GLOBE, crimson, large, fine form; DUCHESS OF YORK, lemon, edged with salmon-pink; DUKE OF FIFE, deep cardinal, large, bold flower; ECLIPSE, orange-scarlet, very handsome; GLOIRE DE LYON (Fig. 310), very large, white, of fine form; GLOWWORM, orange-scarlet; HARRISON WEIR, rich yellow; HARRY KEITH, rosy-purple, large and fine; HENRY WALTON, yellow, edged vermilion, very fine; JOHN HICKLING, bright yellow, very fine; JOHN WALKER, splendid white, grand form; J. T. WEST, yellow, edged with purple, fine; KING OF PURPLES, purple, fine form; LE COLOSSE, red, very large; LUSTROUS, rich crimson-scarlet; MABEL STANTON, clear yellow, lovely form; MISS BARBER, white, deeply tipped with purple; MISS CANNELL, white, tipped rose-pink, large and good form; MONT BLANC, pure white, splendid form; MRS. CHARLES NOYES, light fawn, very fine; MRS. LANGTRY, cream, tipped crimson; MRS. S. HIBBERD, white, tipped pink; NORMA, bright orange-buff; NUBIAN, dark crimson; PENELOPE, fawn and amber, tinted yellow, large and fine; PRINCE OF DENMARK, dark maroon, shaded crimson; QUEEN OF THE BELGIANS, delicate cream, inside of petals soft pink, one of the best; RELIANCE, fawn, shaded rose; R. T. RAWLINGS, clear yellow, fine form; SIR CHARLES MILLS, clear yellow; T. S. WARE, crimson; WARRIOR, brilliant scarlet; WILLIAM KEITH, dark plum, large and good; WILLIE GARRATT, bright cardinal, good habit.

Fancy Varieties. BENNETT GOLDNEY, soft terra-cotta, very fine; BLANCHE KEITH, pure yellow, large, and fine form; BUFFALO BILL, buff, striped with vermilion; CÆSAR, soft reddish-scarlet; CHARLES WOODBRIDGE, crimson, shaded with purple, large, full, and of fine form; COMEDIAN, orange ground, flaked with crimson and tipped with white, fine; CRAWLEY GEM, rich crimson-scarlet, small and pretty, fine for cutting; DANDY, orange, striped crimson; DAZZLER, clear yellow, striped with scarlet; DELICATA, soft pink, shading to yellow in the centre; DUKE OF CLARENCE, deep maroon-scarlet, fine and free; EARL OF PEMBROKE, bright plum; EDMUND BOSTON, orange, heavily striped crimson, fine; EMILY GIRDLESTONE, orange-scarlet, grand form; EMIN PASHA, yellow, heavily splashed with crimson, very fine; ENDYMION, clear cerise, fine; ERIC FISHER, buff, striped scarlet; ERNEST CANNELL, soft red, large and fine; ERNEST CHEAL, rosy-scarlet, flowers well above the foliage; ERNEST GLASSE, purplish-magenta, free; FRANCES HUMPHRIES, bright orange, very fine; FRANK PEARCE, bright rose, striped crimson, splendid flower; FUSILIER, coral-pink; GAIETY, yellow, striped red and tipped with white; GENERAL GRANT, orange, chocolate stripes; GLORIOSA, deep red, yellow at base of petals, extra fine; GRAND SULTAN, buff, bright red stripes; HARTIE KING, orange, striped scarlet; J. E. FREWER, vermilion, large and perfect form; JOHN H. ROACH, soft yellow; JOHN WELCH, deep crimson, petals beautifully twisted; LADY PENZANCE, probably the finest of all the yellows; LEONORA, rosy-pink, long, twisted petals, large and good; MARY HILLIER, buff-salmon, very fine; MATCHLESS, velvety-maroon; MATTHEW CAMPBELL, apricot, striped crimson, very fine; MAYOR OF HASTINGS, glowing crimson, very pretty; MAY PICTOR, pale yellow, with long, beautifully-twisted petals, free; MISS ANNIE JONES, crimson, shaded scarlet, petals twisted, free and fine; MISS A. NIGHTINGALE, clear yellow, flushed scarlet; MISS BROWNING, lovely yellow, tipped white, good form; MISS IRENE CANNELL, light pink, shaded with primrose; MISS JANE BASHAM, brick-red, beautifully twisted and pointed petals; MONS. CHAUVIERE, lilac, striped crimson; MRS. A. BECK, reddish-salmon, long and beautifully-twisted petals, free and good; MRS. BARNES, pale primrose, tinged pink, a charming variety; MRS. BENNETT, soft crimson, large and fine form; MRS. C. TURNER, bright yellow, large and floriferous; MRS. GLOVER, rosy-red, shaded orange, dwarf and floriferous; MRS. GORDON SLOANE, pinkish terra-cotta, one of the best for cutting; MRS. H. CANNELL, bright amber, dwarf and free; MRS. JOHN DOWNIE, orange, striped scarlet, very fine; MRS. MONTEFIORE, crimson-scarlet, a large, fine variety; MRS. MORTIMER, yellow, tipped fawn; MRS. N. HALLS, bright scarlet, tipped with white; MRS. WILSON NOBLE, pinkish, free, one of the best; NOVELTY, soft rose, flaked purple and pink; PELICAN, white, striped purple; PLUTARCH, buff, splashed crimson; PORTIA, lilac, striped purple; PRINCE HENRY, lilac, striped purple, good form; PURPLE PRINCE, dwarf and very fine; ROBERT CANNELL, magenta, large, good form; ROYAL GEORGE, soft crimson-pink, fine habit; S. MORTIMER, deep rose, striped purple; ST. CATHERINE, delicate bronzy-amber; SUNSET, yellow, splashed crimson; THE BISHOP, bright coral-red, petals curled and finely-pointed, excellent; T. W. GIRDLESTONE, lilac, splashed maroon, extra fine; VALKYRIE, rich cardinal, one of the earliest.

Bedding and Bouquet or Pompon Varieties. ACHILLES, pale lilac; ADMIRATION, crimson, tipped white, free and pretty; ARTHUR WEST, deep crimson, very fine; BACCHUS, crimson-scarlet, small and neat flower; BELLE OF SPRINGFIELD (*syn.* RYECROFT GLORY), carmine-red, very free and fine; BOULE D'OR, yellow, very pretty; CAPTAIN BOYTON, deep maroon, shaded crimson; CECIL, red, tipped white, fine; CRIMSON KING, dark crimson, very free; DOLLY KEITH, pure white, neat flower; DON JUAN, maroon, small, of perfect form; DR. RAUCH, orange-scarlet; ELI MILLARD, white, petals fimbriated; ERIC, scarlet, tipped and striped white; EVA, rosy-crimson, very pretty; FAIRY TALES, delicate primrose, free and pretty; FASHION, light orange; FLORENCE WOODLAND, yellow, edged crimson, fine form; FLORRIE BURROUGHS, soft purple, edged maroon, very

Dahlia—*continued.*

fine; GEORGE BRINCKMAN, pure white, fine form; GLADYS VALENTINE, delicate blush; GOLDEN GEM, yellow, fine form; GRUSS AN WIEN, crushed strawberry; HECTOR, scarlet, fine; HERMANN KINDELL, fiery scarlet; HILDA, deep rose, tipped and striped white, free; ISABEL, orange-scarlet; JANET, rich salmon; JESSICA, amber, edged red, very pretty; JOHN SPITTLE, pure white, small, fine for cutting; KARL GOLDENBERG, yellow, tipped white; LILIAN, primrose, edged peach, very fine; LITTLE BOBBY, maroon-crimson; LITTLE DUCHESS, white, edged

FIG. 311. FLOWERS OF POMPON DAHLIA LITTLE SWEETHEART.

crimson, very effective; LITTLE SWEETHEART (Fig. 311), red, tipped with white; LOCKET, pure white, shaded with crimson; MARY DRURY, purple-lake, very fine; MIDGET, soft rose, fine; NERISSA, soft rose; OTHELLO, rich crimson; PHŒBE, deep golden, very fine; PURITY, pure white, excellent; RED INDIAN, coral-red, very pretty; RUBENS, maroon, tipped white; ROWENA, yellow, edged scarlet, fine form; RUY BLAS, crimson and purple, tipped white; SAPPHO, rich maroon, crimson; SOVEREIGN, yellow, free and good; THE MIKADO, purplish-crimson, tipped white; TOMMY KEITH, red, tipped white; VIVID, orange-scarlet, good; WHISPER, clear yellow; ZOAR, yellow, edged salmon-pink, very fine.

Single Varieties. ANNIE HUGHES, clear yellow, margined peach, free and good; BEAUTY'S EYE, rich lilac, with deep crimson ring at base of petals, very distinct; CHILWELL BEAUTY, bright chestnut, excellent; DUCHESS OF ALBANY, soft mauve, edged buff; DUCHESS OF FIFE, bright amber, with deep orange band, perfect form; DUCHESS OF WESTMINSTER, pure white, fine form, and floriferous; DUKE OF YORK, orange-scarlet, with yellow ring round disk, fine form; ECLIPSE, rosy-mauve, crimson ring round disk, extra fine; EVELYN, white, edged with pinkish-mauve; FAUST, rich. reddish-crimson, fine form; GULIELMA, pure white, edged buff, perfect form, very free; HARRY BRATEN, deep rose, splashed velvety-maroon, fine; IVANHOE, deep lilac, fine form and substance; JAMES SCOBIE, yellow, striped and spotted red, dwarf and free; KATE, bright orange-maroon, very pretty; KITTY, white, shaded rosy-mauve, charming; K. L. TEMPLE, deep maroon, shaded with carmine, one of the best; LADY HELEN, clear yellow, tipped white; LADY WHITEHEAD, rich rose-purple, with yellow disk, fine; LITTLE SNOW-WHITE, pure white, excellent for cutting; MISS HENSHAW, crimson-scarlet, free; MISS JEFFRIES, mauve and magenta, with broad red ring round disk; NORTHERN STAR, bright red, edged deep yellow, small, very floriferous; SUNNINGDALE WHITE, pure white; T. W. GIRDLESTONE, pure white, edged purple, fine, and useful for

Dahlia—*continued.*

cutting; THOMAS WHEELER, terra-cotta, distinct; W. C. HARVEY, yellow, with red ring round disk, very good.

FIG. 312. FLOWERS OF SINGLE CACTUS DAHLIAS.

Cactus and Semi-Cactus Varieties (see Figs. 312-314). ANTELOPE, rosy scarlet; ARTHUR CHEAL, rich purplish-crimson, fine and very free, flowers well above the foliage;

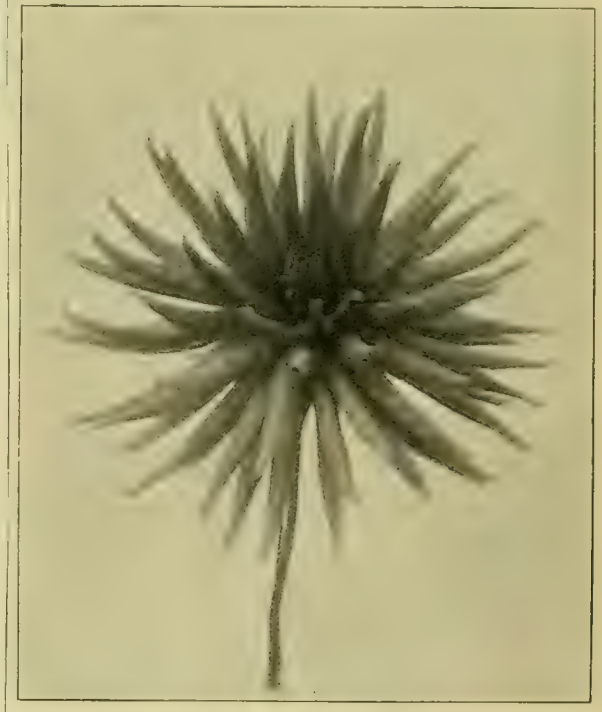

FIG. 313. FLOWER OF CACTUS DAHLIA MISS FINCH.

Dahlia—*continued.*

BEATRICE, pale rose, very fine; BEATRICE MARTIN, white, tinged rose, fine for cutting; COUNTESS OF LONSDALE, purplish-rose, tinged orange, of good habit; EBONY, blackish-maroon, tinted with purple; F. C. PAWLE, rich crimson, tinted with rose, bushy; GREEN'S WHITE, pure white, bushy habit; ISLAND QUEEN, mauve; KEYNES' WHITE, the best white in cultivation; LAVERSTOCK BEAUTY, vermilion, shading to reddish-yellow; LEONORA, bright pink, tinged rose; LOADSTONE, bright orange-red; LUCIUS, orange-red; MAGNIFICENT, orange-buff, shaded rose; MARY SERVICE, shades of heliotrope, pink, and yellow, dwarf; MISS FINCH (Fig. 313), carmine, flushed crimson and purple; MRS. FINDLAY CAMPBELL, orange-scarlet, of excellent form; MRS. HALFORD, rosy-scarlet;

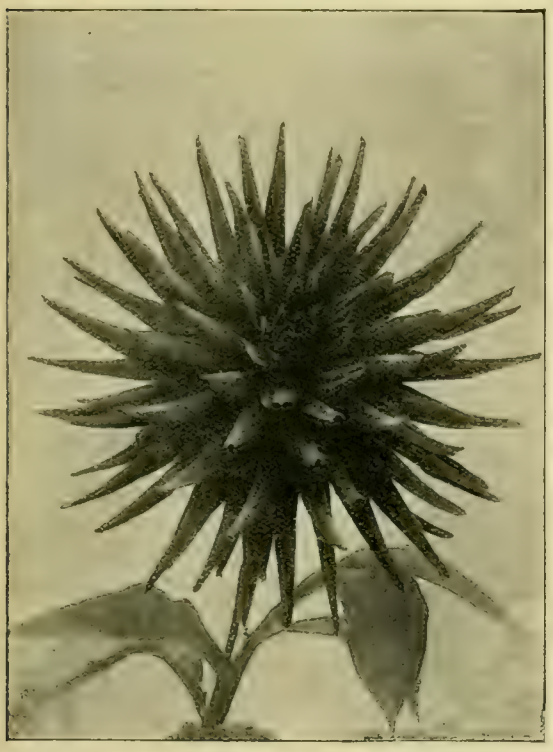

FIG 314. FLOWER OF CACTUS DAHLIA MRS. JOHN GODDARD.

MRS. JOHN GODDARD (Fig. 314); MRS. STEPHENSON CLARKE, yellow, tipped and flushed orange-scarlet; PROGENITOR, glowing scarlet, suffused purple; RANJI, deep maroon; RED ROVER, deep crimson; STARFISH, orange-scarlet, sturdy; SYLPH, orange, handsome; THE CLOWN, deep orange, tipped with white; UNCLE TOM, deep maroon; VISCOUNTESS SHERBROOKE, reddish-terra-cotta, with apricot yellow tinge.

DAHLIA (of Thunberg). A synonym of **Trichocladus** (which *see*).

DALBERGIA. According to the authors of the "Genera Plantarum," this includes *Amerimnon.*

DALEA (of Gærtner). A synonym of **Microdon** (which *see*).

DALIBARDA. Bentham and Hooker include this genus under *Rubus*, and the correct name of *D. repens* is *Rubus Dalibarda.*

DALRYMPLEA. A synonym of **Turpinia** (which *see*).

DAMASONIUM (from *damein*, to conquer; application rather obscure). SYN. *Actinocarpus* (under which name the genus is described on p. 21, Vol. I.). About four species of annual or perennial, stemless herbs are referred here by the authors of the "Genera Plantarum"; two are found in Europe, North Africa, and Western Asia, a third in Australia, and a fourth in California. Flowers white, disposed

Damasonium—*continued.*

in ample, branched racemes or panicles, hermaphrodite; perianth leaflets six, in two series, the three inner ones slender, membranous, and persistent, the outer ones petal-like and deciduous. Leaves all radical, petiolate, ovate, oblong, cordate, or lanceolate, with a prominent midrib.

D. australe (Southern). The correct name of *Actinocarpus minor.*

D. stellatum (star-like). The correct name of *Actinocarpus Damasonium.*

DAMASONIUM (of Schreber). A synonym of **Ottelia** (which *see*).

DAMNACANTHUS. SYN. *Baumannia.* The species of this genus are natives of China, Japan, and the mountains of Eastern Bengal. Flowers white, small, axillary, solitary or in pairs. Fruit red, pea-like. Leaves small, sub-sessile, ovate, acuminate. To the species described on p. 439, Vol. I., the following should be added:

D. indicus (Indian). *fl.* tubular; corolla tube ¼in. long, the segments ¼in. long. Spring. *fr.* 8in. in diameter, borne while the plant is flowering. *l.* opposite, shining green, ¼in. or more in length. Branches slender, with needle-like spines. Japan, &c., 1889. An ornamental, greenhouse or hardy, evergreen shrub.

DAMPING OFF. A disease of seedling plants due to the attacks of a fungus (*Pythium de baryanum*). Prof. Marshall Ward characterises it as "one of the commonest of all maladies found in gardens, occurring in the seed-beds of all kinds of plants in very wet weather, or when the beds are kept too shaded or the seeds have been sown too thickly and kept too moist." At the onset of the attack only a portion of the seedlings appear to be attacked, but gradually the whole of them in seed-bed or seed-pan are involved, and are covered by a white thread-like mycelium. The first symptom that anything is wrong is a characteristic paleness and toppling over of some of the plants, which are attacked just above the soil-line. Such seedlings should at once be removed and burned. As a further preventive measure the same quarters should not be used for seedlings the next season, as the disease is kept alive through winter by means of oospores. Cruciferous plants are very liable to suffer from the disease.

DAMSON MITE (*Bryobia pruni*). A destructive and prolific species of the family *Tetranychidæ*, found, as its common name suggests, upon the Damson. This pest has only been noted within recent years, though doubtless its depredations in the past have been put down to Red Spider, which it somewhat resembles in form, if not in colour. It has eight pairs of legs in the adult state, the front pair being much the longest. Unlike its relative, the **Gooseberry Mite** (which *see*), it spins no web.

The first symptoms of attack are an unhealthy appearance of the leaves, which prematurely yellow. Such leaves, if examined by the aid of a pocket-lens on their under-surface, will be found to harbour numbers of the pests in various stages of development. The mature Mites are reddish-brown; while the larvæ vary considerably as to colour. Prior to the second moult the larvæ are red, and have but six legs. Later the remaining pair is developed, and the colour of the creature undergoes a change. As winter approaches, the larvæ hide beneath the bark or beneath the growths which are allowed to form upon trunk and branches. Here they live in comparative safety, awaiting the advent of the tender young leaves in the spring.

When the Mites are detected the trees should be sprayed with a weak solution of Kerosene Emulsion, sold ready prepared; and in winter, when the trees are at rest, they should be cleansed of Moss and Lichen by the aid of a caustic potash and soda solution sprayed on. *See* **Lichen.**

DANAA. A synonym of **Physospermum** (which *see*).

DANAË (a classical name; Danaë was the daughter of Acrisius, King of Argos, by Eurydice). Syn. *Danaidia.* ORD. *Liliaceæ.* A monotypic genus. The species, *D. Laurus*, is described on p. 335, Vol. III., under its old name, **Ruscus racemosus.**

DANÆA. It is a matter of regret that the requirements of these interesting Ferns should be so little understood. Many importations have taken place within the last few years, but none of the species has become plentiful: the various kinds of treatment have invariably produced unsatisfactory results. Cases after cases of these plants, and

Danæa—*continued.*

FIG. 315. BARREN FROND AND PORTION OF FERTILE FROND OF DANÆA CRISPA.

especially of the beautiful *D. crispa* (see Fig. 315), have reached England in excellent condition, the plants when unpacked being in some instances the very picture of

FIG. 316. FERTILE AND BARREN FRONDS OF DANÆA ELLIPTICA.

Danæa—*continued.*

health; yet none, to our knowledge, have prospered, and the most that has been done with them has been to keep them alive for three or four years, during which time they have gradually dwindled away. Notwithstanding these repeated failures, the beauty of some of the known kinds is such that, should the opportunity of growing them present itself again, they would be well worthy of further trials. They usually come over in their native soil, which appears to be a light yellow, sandy loam of a very porous nature; and they are said to grow naturally in warm, constantly moist, and somewhat close and shady situations. *D. elliptica* (see Fig. 316) is the commonest species.

DANAIDIA. A synonym of **Danae** (which *see*).

DANBYA. A synonym of **Bomarea** (which *see*).

DAPHNE. Including *Mezereum*. The time at which the varieties of *D. Mezereum* are planted is of greater importance than is generally believed. The roots begin to work very early in the year, and transplanting should be carried out in autumn as soon as the leaves have fallen; if this be done in spring, after root-action has commenced, the plants are liable to receive a check. Daphnes should not be planted in a hot, dry, sandy soil: a cool, moist, loamy soil, and an open situation, suit them best. Seeds should be sown in light soil immediately they are gathered, and watered with a fine rose watering-pot, and if placed in a gentle heat germination will take place in a short time; but if the sowing is deferred until spring the seeds become dry, and vegetation takes place very irregularly; besides, they frequently lie dormant in the soil for a couple of years. *D. Laureola* and *D. Mezereum* form admirable stocks for grafting the different varieties upon, which operation should be performed in February or March, placing the stocks in a warm (not hot) propagating-case. It is a good plan to place the stocks in heat a week or so before the operation takes place. Cuttings inserted in moist soil about July, and covered with a bell-glass in heat, root freely. The dwarf-growing varieties are readily increased by layering, also by grafting on fleshy pieces of their own roots in spring. The latter should be plunged in a genial bottom-heat.

To the species and varieties described on pp. 449-1, Vol. I., the following should be added:

D. Blagayana. The flowers of this charming, hardy, European species are shown in Fig. 317. (B. M. 7519.)

D. caucasica (Caucasian). *fl.* white, fragrant, sub-sessile, in terminal clusters of two to twenty; perianth tube ¼in. long, silky-pubescent, the lobes about ¼in. long. May. *l.* 1in. to 1½in. long, linear-lanceolate or oblanceolate, pale green above, slightly glaucous beneath. Caucasus, 1893. A dwarf, hardy, quite glabrous, deciduous shrub. (B. M. 7383.)

D. glomerata (clustered). *fl.* violet-purple, sessile, exceeding the bracts, clustered in umbels amongst the leaves. *l.* lanceolate or oval-lanceolate, about 1in. long, forming a crown to the naked stems. Caucasus, 1891. A dwarf, hardy shrub, something in the way of *D. Blagayana*.

D. indica elegantissima (very elegant). A variety having the leaves broadly margined with white. Japan, 1870.

D. jezoensis (Jezo). *fl.* yellow, fragrant, produced amongst the bases of the leaves, on persistent pedicels; perianth segments spreading, ovate, acute. *l.* obovate-oblong, obtuse, attenuated to a short petiole, pale beneath. Branches highly glabrous, nearly erect. *h.* 2ft. Isle of Jezo, Japan, 1886. A much-branched shrub. (R. G. t. 496, f. 1, 3.)

D. salicifolia (Willow-leaved). A synonym of *D. caucasica*.

D. Mazelii has also been introduced.

DAPHNIDIEÆ. Meissner's name for the species embraced in the genera *Laurus* and *Lindera*.

DAPHNIPHYLLACEÆ. Included under **Euphorbiaceæ** (which *see*).

DAPHNIPHYLLUM (from *Daphne*, and *phyllon*, a leaf; the leaves resemble those of *Daphne*). SYNS. *Goughia*, *Gyrandra*. ORD. *Euphorbiaceæ*. A genus including eleven species of small, glabrous, stove, greenhouse, or hardy, evergreen trees, natives of tropical Asia and the Malayan Archipelago. Flowers apetalous, dicœcious, in axillary racemes; stamens of the males five to eighteen. Leaves alternate, long-petiolate, quite entire, penninerved, usually glaucous beneath. Branches robust, leafy at the tips. Only two species have been introduced. They are evergreen shrubs, quite hardy near London, and thrive under ordinary treatment.

Daphniphyllum—*continued.*

D. glaucescens (glaucous), of gardens. A synonym of *D. macropodum.*

D. jezoense (Jezo). A much dwarfer plant than *D. macropodum*, having the leaves glaucous beneath.

D. macropodum (large-footed). *fl.* borne in short, axillary racemes. Autumn. *fr.* black, about the size of peas. *l.* 6in. to 8in. long, lanceolate, acute, dark green above, paler and more glaucous beneath. *h.* about 6ft. in cultivation (30ft. in its native places). China and Japan. SYN. *D. glaucescens* (of gardens, not of Blume).

DAPHNITIS. A synonym of **Botryceras** (which *see*).

DAPHNOIDEÆ. Included under **Thymelæaceæ** (which *see*).

DAPHNOPSIS. ORD. *Thymelæaceæ.* None of the species of this genus are in cultivation. *Nordmannia cordifolia* has been referred in a gardeners' handbook to *Daphnopsis*, but it belongs to a different natural order (*Boragineæ*), and is really identified with **Trachystemon orientalis** (which *see*).

DASYSTACHYS (from *dasys*, thick, and *stachys*, a spike; in allusion to the dense racemes). ORD. *Liliaceæ.* A genus embracing, according to Mr. J. G. Baker, fifteen species of stove, tuberous-rooted perennials, restricted to tropical Africa, and closely allied to *Chlorophytum.* Flowers white, small; perianth polyphyllous, campanulate; racemes densely many-flowered, usually simple, subspicate; bracts persistent. Leaves radical, linear or lanceolate. For culture of the only species introduced, *see* **Chlorophytum.**

D. drimiopsis (Drimia-like). *fl.*, perianth ⅛in. long, the segments having a brown keel; raceme 3in. to 6in. long, the rachis pubescent; peduncle leafless, 3in. to 12in. long. *l.*, produced ones three, linear, erect, glabrous, 1ft. to 1½ft. long, ¼in. to ½in. broad. Mozambique, 1898. (B. M. 7580.)

DASYSTEMON (of De Candolle). Included under **Crassula** (which *see*).

DASYSTEPHANA. A synonym of **Gentiana** (which *see*).

DASYSTOMA. Included under **Gerardia** (which *see*).

DATE PALM, PRICKLY. *See* **Acanthophœnix.**

FIG. 317. FLOWERS OF DAPHNE BLAGAYANA.

DARWINIA. SYN. *Polyzone.* Including *Francisia.* About twenty-two species of this genus have been described.

DASISTOMA. Included under **Gerardia** (which *see*).

DASURUS. A synonym of **Chamælirium** (which *see*).

DASYAULUS. A synonym of **Bassia** (which *see*).

DASYCHIRA. *See* **Tussock Moths.**

DASYLIRION. About eight species, natives of Mexico-Texan North America, have been referred to this genus. To those described on pp. 442-3, Vol. I., the following should be added:

D. junceum (Rush-like). A garden name for *Agave striata.*

D. quadrangulatum (four-angled). *fl.* small, disposed in a dense, spike-like panicle; flower-stem about 5ft. high. *l.* slender, quadrangular, about 2ft. long. Stem stout, about 3ft. high, crowned with a dense tuft of leaves. Texas, 1887. (R. G. 1887, p. 280.)

D. texanum (Texan). The correct name of *D. graminifolium.* The panicle is 2ft. to 3ft. long.

D. Wheeleri (Wheeler's). Similar in size and habit to *D. texanum*, but with longer, flexuous, usually pendent racemes. *l.* seven to nine lines broad, with brown-tipped teeth. Arizona, &c.

DASYSCYPHA CALYCINA. *See* **Larch Canker.**

DATE, WILD. *See* **Phœnix sylvestris.**

DATURA. This genus embraces about a dozen species, distributed over the warm and temperate regions of the globe. Fruit bristly or smooth. Leaves ample, entire or sinuate-toothed. To the species described on p. 444, Vol. I., the following should be added:

D. aurea (golden). In habit and foliage this does not appear to differ from *D. arborea*, but the flowers are golden-yellow. 1893.

D. chlorantha. The typical species, the double form of which is described in Vol. I., was, according to the "Gardeners' Magazine," introduced in 1894.

D. cornigera Knightii (Knight's). A pretty variety with large, double, white, pendent flowers.

D. cornucopia (cornucopia). *fl.* large and semi-double; interior of the limb very pale lavender, the exterior and the tube lavender profusely spotted with purple. *l.* dark green. 1893. A distinct and handsome form, of dense growth.

D. fastuosa. There are a double-flowered form of this and others called *Huberiana* and *rubra* in gardens; they are probably hybrids.

D. ferox (fierce). *fl.* bluish-white, erect; calyx striated, half as long as the corolla, which is 1½in. long, with an angled limb. August. *l.* ovate-rhomboid, sinuate-repand, toothed. Stem 1ft. to 2ft. high. China, &c., 1731.

D. Knightii (Knight's). A variety of *D. cornigera.*

D. Tatula is a variety of *D. Stramonium.*

DAVALLIA. Including *Odontosoria* and *Synaphlebium*. When grown in either pots or pans, Davallias that are provided with rhizomes require to be a little elevated above the rim of the pot, as nothing is more injurious to them than to have their rhizomes buried in the soil, especially the species whose rhizomes are clothed with large, chaffy scales. Most of them are averse to heavy or close soil, and delight in a compost of three parts fibrous peat, one part chopped sphagnum—or, better still, good leaf-mould—and one part silver-sand, with thorough drainage and an abundant supply of water at the roots during the growing season. During winter they must be watered sparingly, never allowing even deciduous kinds to become quite dry. The plants must not be syringed overhead; but they delight in being kept near the glass. Propagation in the case of those species not producing rhizomes is by spores, sown in heat. Where Davallias like *dissecta*, *bullata*, and *Mariesii* are required in quantity they are best raised from spores. As soon as the seedlings have produced a rhizome 2in. long, this latter is repeatedly pruned, which tends to make compact, bushy plants.

Many Davallias require special treatment. *D. alpina* is one. This requires a warm temperature and moist atmosphere, but without overhead syringing, and to be grown on a pyramid of fibrous peat. *D. bullata* is one of the most useful species in cultivation, succeeding equally well in stove or in greenhouse, and making a very fine specimen, whether grown in a shallow pan of good dimensions, on a pyramid of peat, or on a vertical piece of cork or Tree-Fern stem, where the rhizomes have plenty of room for extension. The Hare's-foot Fern (*D. canariensis*) (Fig. 319) is a very ornamental and interesting species, useful for either pots or for planting on rockwork. Its popular name is derived from the fact that its prostrate stems, which are covered

FIG. 318. DAVALLIA ANGUSTATA.

with pale-brown chaffy scales, have a very close resemblance to the feet of a hare. It also succeeds well under greenhouse treatment, and is an excellent plant for rooms. *D. divaricata* (Fig. 320) is best accommodated on a projecting rock in the warm Fernery. It is a shallow-rooting plant, requiring but a few inches of soil to develop itself to perfection, and on that account may easily be grown on the trunk of a dead Tree-Fern. *D. angustata* (Fig. 318) is a singular little stove species found upon Trees in its native country.

As basket subjects, Davallias are in the first rank. Some of the best are *D. Mariesii* (Fig. 322), *D. fijiensis* and its forms (all of which like peat), *D. canariensis*, *D. immersa*, *D. hirsuta*, *D. marginalis*, *D. retusa*, and *D. bullata*. Sometimes *D. hirsuta* may be accommodated upon the rockery, when it should be placed upon a prominent piece of rock to allow its rhizomes full development. *D. hirta cristata* is one of the strong-growing Davallias which should for preference be grown in fibrous peat and sand only; it is also one of those which suffer most from insufficiency of water at the

Davallia—*continued.*

roots at any time of the year. The whole plant is slightly hairy, and on that account should never be watered overhead. It very seldom produces fertile fronds, and is therefore generally increased by division of the crowns in the early part of the year.

D. pallida is a very attractive species, but its chief merit lies in the fact that it forms a large specimen in a comparatively small pot. Highly decorative, too, and easily grown, is *D. tenuifolia*, but the soil in which it is planted must not contain loam. *D. parvula*, although it grows only a few inches high, is attractive on account of the neatness of its habit. It requires only a very shallow pan, and great care must be taken to keep the whole of the rhizomes above ground. *D. platyphylla* makes an exceedingly handsome specimen when grown in a pot, but it progresses still more rapidly when planted in a substantial compost in the rockery, where an abundance of water can be allowed it during the summer. Another species suited to the rockery is the graceful *D. strigosa*; it requires but little soil. For growing upon a tree-trunk *D. heterophylla* is exceedingly adapted, being a surface-rooter.

D. parallela (Fig. 323) is a minute stove species, which in habit and size resembles our native Polypody.

To the species described on pp. 445-7, Vol. I., the following should be added:

D. aculeata (prickly). *rhiz.* creeping, stout, fibrillose. *sti.* (including rachis) 4ft. to 6ft. long, strong, scandent, spinose-flexuose. *fronds* tripinnatifid; lower pinnæ 1ft. to 1½ft. long, 4in. to 6in. broad, ovate-lanceolate; pinnules lanceolate, 2in. to 3in. long, 1in. broad; segments ¼in. broad, cuneate, deeply two- to four-lobed. *sori* small, cup-shaped, terminal. West Indies. Stove. SYN. *Stenoloma aculeata.*

D. assamica (Assam). *rhiz.* stout, wide-creeping, densely clothed with light brown scales. *sti.* naked, 1in. to 3in. long. *fronds* 6in. to 12in. long, spear-shaped, tripinnatifid; pinnæ shortly stalked; pinnules crowded, naked on both surfaces. *sori* disposed close to the margins of the ultimate lobes; involucres as broad as deep. Bhotan. Stove. SYNS. *Acrophorus assamicus*, *Leucostegia assamica.*

D. brachycarpa (short-fruited). A form of *D. gibberosa.*

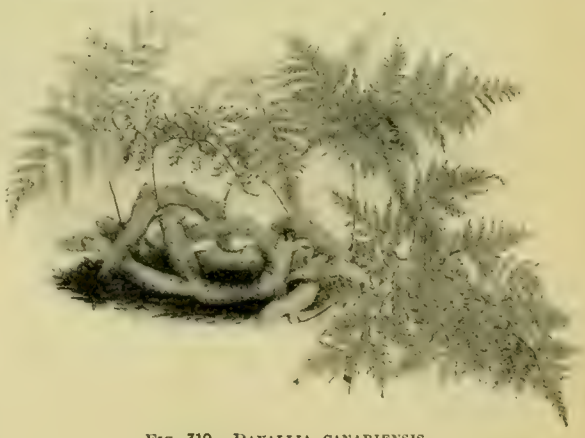

FIG. 319. DAVALLIA CANARIENSIS.

D. ciliata (ciliated). *rhiz.* creeping, densely covered with soft, brown hairs. *sti.* firm, erect, 3in. to 4in. long, hairy. *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad, spear-shaped, tripinnatifid, thin and papery, the rachis and under-surface softly hairy. *sori* very small, disposed two to twelve in a pinnule, and placed near the centre of the teeth near the base. Philippine Islands. Stove. (H. S. F. i., p. 184, t. 60A.) SYN. *Microlepia ciliata.*

D. cristata (crested). A synonym of *C. strigosa.*

D. elata (tall). A form of *D. elegans.*

D. elegans polydactyla (many-fingered). This differs from the type in the many-fingered, dilated apex of the frond, and of the pinnæ, which are all multifidly divided or crested in such a manner as to give the plant an extremely ornamental character. 1882.

D. epiphylla (upon a leaf). This species has fronds more coriaceous than in *D. elegans*, more finely-divided segments, very small sori, and sharp teeth protruded considerably beyond them. Java and the Malayan Peninsula. Stove.

Davallia—*continued.*

FIG. 320. PINNA OF DAVALLIA DIVARICATA.

D. ferruginea (rusty). *sti.* wide-creeping, climbing, not prickly. *fronds* quadripinnatifid; pinnules of the lower pinnæ 2in. to 3in. long, 1in. broad, ovate; segments 1in. long, ⅜in. broad, cut down to the rachis below, the lobes ¼in. to ⅜in. broad, cuneate at base, both deeply-toothed and shallowly crenate. *sori* small, marginal, shallow. Madagascar, 1837. SYN. *Stenoloma ferruginea.*

FIG. 321. UPPER PORTION OF FROND OF DAVALLIA HIRTA CRISTATA.

Davallia—*continued.*

FIG. 322. FROND OF DAVALLIA MARIESII.

D. fijensis elegans (elegant). A pretty variety, lighter-coloured and less dense than the type. 1893.

D. f. major (greater). *fronds* not so finely cut as in the type, borne on slender stalks, and much lighter in colour. Plant more robust.

D. f. plumosa (feathery). In this variety the segments are extremely narrow, and all parts of the frond have a specially graceful, plumose appearance. 1882.

D. fœniculacea (Fennel-like). *sti.* erect, firm, 6in. to 8in. long. *fronds* 9in. to 18in. long, 6in. to 12in. broad, lanceolate-deltoid, quadripinnate; lower pinnules lanceolate, acuminate, 2in. to 3in. long, 1in. broad; segments cut down to the rachis into simple or forked, linear, filiform ultimate divisions one to two lines long, equalling the rachis in breadth. *sori* two to six to a segment, lateral, deeply half-cup-shaped. Fiji Islands, 1885.

FIG. 323. DAVALLIA PARALLELA.

Davallia—*continued.*

D. gibberosa brachycarpa (short-fruited). *sori* as broad as deep, overtopped by a long horn. New Hebrides, 1884.

D. hirsuta (hairy). *rhiz.* slender, creeping, hairy. *sti.* slender, erect, hairy, 3in. to 4in. long. *fronds* abundantly produced, narrow-hastate, 6in. to 9in. long, 2in. broad, tripinnatifid, soft and papery; pinnæ cut down to a broadly-winged rachis into oblong, rather sharply-toothed lobes; both surfaces softly hairy. *sori* two to six to a segment, situated on the marginal teeth. Japan and Tsus-Sima. Greenhouse. SYN. *Microlepia hirsuta.*

Davallia—*continued.*

D. membranulosa (almost membranous). *rhiz.* wide-creeping, stout, densely clothed with pale brown scales. *sti.* 2in. to 3in. long. *fronds* thin, papery, 6in. to 9in. long, 2in. to 3in. broad, once fully pinnate, but the lower pinnæ cut down into numerous sharply-toothed, oblong segments. *sori* two to eight to a segment, obliquely placed between the mid-vein and the margin, Himalayas, Kumaon, &c. Greenhouse. SYN. *Leucostegia membranulosa.*

D. multidentata (many-toothed). *fronds* 2ft. to 3ft. long, 1ft. broad, bipinnate, of a soft, papery texture; pinnules of the lower leaflets cut into egg-shaped segments, each of which bears two to twelve sori at the base of its teeth on the upper side of the central vein. Sikkim Himalaya, &c. A delicate, greenhouse species, having much the appearance of *Asplenium tenuifolium.* SYN. *Leucostegia multidentata.*

FIG. 324. DAVALLIA TENUIFOLIA VEITCHIANA.

D. hirta cristata (crested). *fronds* drooping, beautifully crested. South Sea Islands. See Fig. 321.

D. illustris (remarkable). *rhiz.* stout, creeping, scaly. *sti.* reddish-brown. *fronds* 2½ft. to 4ft. long, arching; pinnæ finely cut. A capital basket plant. 1899.

D. Lorrainii (Lorraine's). *rhiz.* black-scaly. *sti.* 3in. to 4in. long. *fronds* 6in. to 12in. long, deltoid, quadripinnatifid; final lobes ligulate, with a sorus at the base of the inner side. Malay Peninsula, 1882.

D. lucida (clear). A synonym of *D. solida.*

D. ornata (adorned). A form of *D. solida.*

D. polypodioides (Polypodium-like). A synonym of *D. Speluncæ.*

D. pycnocarpa (thick-fruited). A synonym of *D. pentaphylla.*

D. retusa (retuse). A synonym of *Lindsaya retusa.*

Davallia—*continued.*

D. rhomboidea (rhomboid). A form of *D. stylosa.*

D Speluncæ (cavern-loving).* *sti.* strong, 1ft. to 1½ft. long. *fronds* pale green, soft, papery, 3ft. to 6ft. long, 1ft. to 2ft. broad, somewhat triangular, three or four times pinnatifid; lower leaflets 6in. to 12in. long, 3in. to 4in. broad; pinnules spear-shaped, cut to the rachis below into oblong, deeply-toothed lobes. *sori* small, abundant, one or more at the base of each lobe. India, China, &c. A distinct and uncommon, easily-grown, stove species. SYNS. *D. polypodioides, D. trichosticha, Microlepia trichosticha.*

D. tenuifolia Burkei (Burke's). A handsome, delicate, and beautifully-cut form, with fronds hanging down 2ft. or more, and very suitable for basket-culture. 1895.

D. t. stricta (erect). *fronds* more erect, larger, darker, and more coriaceous than in the type.

D. t. Veitchiana (Dr. J. T. Veitch's). *fronds* spreading, plume-like, broadly ovate, quadripinnate; ultimate lobes cuneate, simple or bifid. China, 1883. A handsome basket Fern. See Fig. 324, for which we are indebted to Messrs. James Veitch and Sons.

FIG. 325. DAVALLIA TRICHOMANOIDES.

D. trichomanoides (Trichomanes-like).* *rhiz.* wide-creeping, covered with pale-brown scales. *sti.* grey, naked, 3in. to 6in. long. *fronds* 6in. to 9in. long, elongated-triangular, somewhat coriaceous, quadripinnatifid; pinnæ distinctly stalked, spear-shaped, the lowest and largest 1½in. to 2in. broad; pinnules cut into strap-shaped segments. *sori* showing a horn projecting on both sides. Malay Islands and Ceylon. A very pretty, stove species. See Fig. 325.

D. trichosticha (having hairs disposed in rows). A synonym of *D. Speluncæ.*

D. Truffautiana (Truffaut's). This is described as "a particularly handsome and distinct species, with large, spreading

Davallia—*continued.*

fronds, a peculiarity of which is that the under-surface is like the upper." Peru, 1896. (G. M. 1896, p. 352.)

D. vestita (clothed). *fronds* like those of *D. pedata*, but the barren ones having all their segments, except those of the lower pinnules, blunt and scarcely toothed; lobes of the fertile segments (in the teeth of which the sori are placed) narrower and more sharply toothed. Ceylon and Java. Stove.

DAVID'S HARP. *See* **Polygonatum multiflorum.**

DAVIESIA. To the species described on p. 448, Vol. I., the following should be added:

D. corymbosa (corymbose). *fl.* white, red; standard ¼in. long, racemes usually shorter than the leaves and flowering from above the middle or from the end only. July. *l.* usually lanceolate or linear, rarely broader and oblong, 1½in. to 3in. long. *h.* 2ft. to 5ft. 1804. (A. B. R. 611.) SYNS. *D. glauca* (L. B. C. 43), *D. mimosoides* (B. M. 1957).

D. c. mimosoides (Mimosa-like). *fl.* smaller; racemes flowering from below the middle. *l.* usually narrow, with more pinnate veins. 1809. SYNS. *D. linearis* (L. B. C. 1615), *D. virgata* (B. M. 3196).

D. genistoides (Genista-like). A synonym of *D. ulicina.*

D. glauca (glaucous). A synonym of *D. corymbosa.*

D. linearis (linear). A synonym of *D. corymbosa mimosoides.*

D. mimosoides (Mimosa-like). *See* **D. corymbosa.**

D. ulicifolia (Ulex-leaved). A synonym of *D. ulicina.*

D. ulicina (Ulex-like). *fl.* yellow, solitary or clustered, rarely in umbels of three or four; standard broad. June. *l.* broadly-ovate to lanceolate or linear, pungent-pointed, ¼in. to 1in. long. *h.* 3ft. 1792. (L. B. C. 44; P. M. B. iv. 29.) SYNS. *D. genistoides* (L. B. C. 1552), *D. ulicifolia* (A. B. R. 304).

D. virgata (twiggy). A synonym of *D. corymbosa mimosoides.*

DEADLY CARROT. *See* **Thapsia.**

DEAL, WHITE. *See* **Picea excelsa.**

DEAL, YELLOW or RED. *See* **Pinus sylvestris.**

DEATH'S HERB. *See* **Atropa Belladonna.**

DEBRÆA. A synonym of **Erisma** (which *see*).

DEBREGEASIA (derivation not stated, but probably commemorative). SYN. *Morocarpus.* ORD. *Urticaceæ.* A small genus (five species) of stove or greenhouse shrubs or trees, natives of tropical and sub-tropical Asia and Africa. Flowers monœcious or dicœcious, in capitate, sessile, panicled or spicate clusters; males having three to five sepals and petals; females having a fleshy receptacle and an ovoid or obovoid perianth, succulent in fruit. Leaves alternate, serrated, three-nerved; stipules bifid. Only one species has been introduced. It requires ordinary greenhouse treatment.

D. velutina (velvety). *fl.*, sepals four; heads in short, dichotomous cymes. *fr.* red or yellow, about the size of a pea, in shortly-stalked heads. *l.* stalked, linear- or oblong-lanceolate, acuminate, serrulated, rounded at base, 4in. to 7in. long, smooth or scabrid above, white- or ashy-tomentose beneath. *h.* 6ft. to 9ft. Sub-tropical Himalaya, &c., 1896. (R. H. 1896, p. 321, f. 118.)

DECABELONE. This genus includes three species, one being a native of Angola and the others South African. Flowers large, solitary or twin, shortly pedicellate; calyx segments five, acute; corolla tubular-campanulate, slightly incurved, marbled and spotted within, broadly five-lobed; corona duplex, the outer one of ten lobes, the inner of five scales. Stems dwarf, with six to twelve very elevated ribs.

DECAISNEA. To the species described on p. 449, Vol. I., the following should be added:

D. Fargesii (Farge's). *fl.* in axillary, loosely paniculate, erect racemes; pedicels much shorter than the flowers. *fr.* azure-blue, pendent, cylindrical. *l.* long-petiolate; leaflets six to ten pairs, stalked, membranous, ovate-lanceolate, acuminate, entire, glaucous, slightly powdered. Su-tchuen. Plant woody, erect, with fragile branches.

DECAISNEA (of Brongniart). A synonym of **Prescottia** (which *see*).

DECAISNEA (of Lindley). A synonym of **Tropidia** (which *see*).

DECASCHISTIA (from *deka*, ten, *schistos*, divided; in allusion to the ten bractcoles, the ten-celled ovary, the ten-branched style, and the ten-valved capsule). ORD. *Malvaceæ*. A small genus (four or five species) of stove shrubs, natives of India and Birma. Flowers shortly pedunculate, axillary or clustered and terminal; sepals and petals five, connate below, the latter adnate to the tube of the stamens; bracteoles ten. Leaves entire or lobed. Only one species has been introduced. For culture, *see* **Hibiscus.**

D. ficifolia (Ficus-leaved). *fl.* coppery-red, merging into yellow, with a rosy spot at the base, 3in. or more in diameter. *l.* three-lobed, cuneate at base; lobes toothed, hoary beneath. Birma, 1888. A handsome shrub.

DECASPERMUM. A synonym of **Nelitris** (which *see*).

DECASPORA. A synonym of **Trochocarpa** (which *see*).

DECODON. Included under **Nesæa** (which *see*).

DECOSTEA. A synonym of **Griselinia** (which *see*).

DECUMARIA. *Forsythia* (of Walter) is identical with this genus.

DEER GRASS. *See* **Rhexia virginica.**

DEFINITE. Constant, fixed, or limited in number; stamens are said to be Definite when they do not exceed a score.

DELAIRIA SCANDENS. A synonym of **Senecio mikanioides** (which *see*).

DELIMA. *Leontoglossum* is synonymous with this monotypic genus.

DELPHINIUM. This genus comprises about forty species, distributed over the North temperate zone. For the herbaceous border there are no brighter or more easily grown plants than the hybrid perennial Larkspurs, provided the soil is fairly rich and there is an abundance of water during the growing season. After the first flush of beauty is over, it is a good plan to cut the plants right down. Further blossoms will then be produced, which, if not so fine as those first seen, will tend to prolong the season of beauty of these useful, hardy plants. These Delphiniums should be planted in early spring, and whether used in the border, as already suggested, in the beds, or in the shrubbery, they are equally effective when in flower. When planting the crown should be kept about 2in. beneath the surface.

To the species and varieties described on pp. 450-1, Vol. I., the following should be added:

D. armeniacum (Armenian). *fl.* azure-blue. Armenia, 1894. This plant closely resembles *D. Ajacis*, but is more robust.

D. azureum album (white). *fl.* creamy-white, in long, wand-like racemes. *l.* large, deeply three- to five-parted, the divisions cleft into narrow lobes. Stems 2ft. to 3ft. high. North America, 1832.

D. cashmirianum Walkeri (Walker's).* *fl.* 1in. or more in diameter; sepals pale blue, striped with darker blue; petals dull yellowish, tipped with brown; peduncles 3in. to 4in. long, one-flowered. *l.* orbicular, three- to five-lobed; lobes lobulate. Kashmir, 1885. A dwarf, rockwork plant. (B. M. 6830.)

D. caucasicum (Caucasian). *fl.* blue; spur slightly incurved, about as long as the hairy sepals; peduncles long. *l.* long-petiolate, 1½in. across, cordate-orbicular, tripartite; segments ovate, obtuse, incisely lobed. Stems 3in. to 4in. high, sparsely hairy, three- or four-flowered. Caucasus, 1880. There is a variety *dasyanthum*, rather larger than the type.

D. chinense (Chinese). A variety of *D. grandiflorum*.

D. corymbosum (corymbose). *fl.* densely racemose; sepals pale violet, petaloid; petals almost black, the upper one erect, the lower spreading, bifid, bearded. *l.*, lower ones palmately five-lobed, hairy on both sides, the lobes repeatedly three-lobed; upper cauline ones petiolate or sessile, palmately five-lobed. Stems corymbosely branched. *h.* 1ft. to 1½ft. Eastern Turkestan. (R. G. 1059.)

D. denudatum (denuded). *fl.* nearly 1in. long, many, in much-branched racemes; sepals yellow, with blue margins; petals pale blue. *l.*, radical ones 2in. to 6in. in diameter, orbicular, five- to nine-partite, the segments bipinnatifid; cauline ones few, the uppermost ones tripartite. Stem branched, 2ft. to 3ft. high. Temperate Himalayas, 1870

Delphinium—*continued.*

D. hybridum sulphureum (sulphur). A synonym of *D. Zalil.*

D. nudicaule aurantiacum (orange-coloured). A garden variety. 1883.

D. Nuttalli (Nuttall's).* *fl.* white, with sky-blue spots on the upper segments, produced in branching spikes occupying about one-third of the scapes. *h.* 2ft. to 2½ft. North America.

D. peregrinum (foreign). *fl.* blue; spur ascending, twice as long as the rest of the flower. July. *l.* tripartite, the segments linear-lanceolate. Branches straight. *h.* 1ft. North Italy, &c., 1629.

D. speciosum glabratum (showy, glabrous). This is similar in growth and flowers to *D. cashmirianum*, but has larger inflorescences, and the flowers have longer spurs. Himalayas, 1897.

D. sutchuenense (Su-tchuen). A synonym of *D. cheilanthum.*

D. tatsiensis (Ta-tsien-lu). *fl.* cobalt-blue. *l.* much smaller than in *D. cheilanthum* (to which this species is allied). *h.* 2ft. China, 1896.

D. trolliifolium (Trollius-leaved). *fl.* bright blue, 1in. to 1½in. broad; spur as long as the sepals; raceme loose, few-flowered, with rather long pedicels. *l.* long-petiolate, five- to seven-lobed; lobes laciniately cleft and toothed, with acuminate segments. Stems stout, 2ft. to 4ft. high, glabrous or slightly hairy. Oregon, 1889.

D. viride (green). *fl.* loosely racemose; sepals and the long, stout spur yellowish-green; petals deep purple. *l.* palmately cut and toothed. Chihuahua, 1888. Annual or biennial. (G. & F. 1888, i., pp. 149-50, f. 29.)

D. Zalil (Zalil).* *fl.* pale yellow, rather larger than a shilling, disposed in long racemes. May to August. *l.* dark green, finely cut. Stem branching; branches 8in. to 16in. long. Afghanistan, 1887. An attractive annual, the flowers of which are extensively used, especially in Persia, for dyeing silk. (B. M. 7049.) SYN. *D. hybridum sulphureum.*

Varieties. These are now very numerous, and are far superior in colour-range and general effectiveness to the older garden kinds. The following is a good selection, varying from pale blue to deep purple, and all of stately growth:

ALBERT EDWARD, deep plum, black eye; ALFRED HENDERSON, violet, white centre; ASPIRATION, rich violet, white eye, semi-double; BANQUO, violet-purple, black eye; BASSANIO, violet, semi-double; BEAUTY, pale blue, white eye; BRITANNIA, very deep blue, large white eye; CETO, sky-blue, semi-double; CLARA STUBBS, deep blue, white centre; DAVID, deep blue, black eye; DUKE OF CONNAUGHT, bright blue, dark eye; DUKE OF TECK, bright blue, white eye; EVELYN, dark blue, edged lighter blue, semi-double; FRANK HOLL, deep blue, white centre; GAINSBOROUGH, deep blue, with violet inner petals, semi-double; GENEVA, sky-blue, white eye, semi-double; HENRY, deep blue and purple, white eye; HORACE, violet-purple, white eye; JAMES KELWAY, violet-blue, white eye; J. S. SARGENT, deep blue, shading to plum, with dark eye; KING OF DELPHINIUMS, rich deep blue, white eye, semi-double; LADY ESTHER GORE, azure-blue, white eye; MONUMENT, lavender, darker centre, semi-double; MR. CROMPTON ROBERTS, rich purple and deep blue in combination, with dark eye; MRS. RUSHTON, bright blue, veined rose, white centre; SARA, sky-blue, pink veinings and white centre; SIR JOHN FORREST, dark blue and violet-purple, creamy-white eye; SIR WALTER SCOTT, purple and blue, dark eye; TRUE BLUE, gentian-blue, black eye.

DELTOIDES. *See* **Snout Moths.**

DEMATIEI. *See* **Mould.**

DEMETRIA. A synonym of **Grindelia** (which *see*).

DEMIDOVIA. A synonym of **Tetragonia** (which *see*).

DENDRAGROSTIS. A synonym of **Chusquea** (which *see*).

DENDRIUM. A synonym of **Leiophyllum** (which *see*).

DENDROBIUM. SYNS. *Callista*, *Ceraia*, *Desmotrichum*, *Onychium* (of Blume). Including *Aporum*. This genus is here revised in accordance with the admirable monograph published by Messrs. James Veitch and Sons, in Part III. of their "Manual of Orchidaceous Plants."

None of the Eastern genera of Orchids have gained so much prominence of late years as the various species and hybrids belonging to the deciduous section of Dendrobiums, and certainly none are worthier of consideration. The numerous hybrids, especially new introductions, which have been derived from the intercrossing of the various species,

Dendrobium—*continued.*

are always sought after. These are now extensively grown for cut-flower purposes. The exhibition tables also are adorned profusely with these gems during the early spring months of the year.

With the more extensive cultivation of Dendrobiums, it is pleasing to note that many of the "old fads," such as growing the plants on blocks, the absolute necessity of using charcoal for drainage, the hard-and-fast rules for damping the houses, watering, and their barbarous treatment during the resting season, are things of the past. Under the more generous and practical methods now adopted this section of plants is now grown far more easily and with better results than was the case in the past.

The requirements now generally accepted in the successful culture of deciduous Dendrobiums are—first, to place the plants in as small a receptacle as possible, so that very little compost indeed is required, and that consisting of fibrous peat, with the whole of the dust extracted, and chopped living sphagnum in equal portions; secondly, to pot immediately after the plants have flowered and are commencing to emit new roots from the base of the growth; and, thirdly, to give every encouragement to induce rapid and vigorous growth. The whole section requires any amount of strong light throughout the year. Only sufficient shade is required to prevent actual scorching of the foliage. In such conditions, and by maintaining during the day a high temperature in the house without resorting to fire-heat, rapid growth may be ensured. During the summer, at night only will fire-heat be necessary. In bright weather the plants may be liberally syringed, and every measure used to keep the atmosphere at the saturation point. The plants may also be watered whenever they become anything like dry.

The lower ventilators should be brought into use early in the day, and closed again as soon as possible after the middle of the day. As soon as this has been done, and the outside conditions are favourable, the whole of the plants should be given a thorough syringing overhead. This operation should always be done sufficiently early to enable the foliage to become dry before the cool evening, with a lowering temperature, arrives. These conditions should be maintained until the growth has matured; after which the plants should be gradually removed to cooler and drier quarters, where they may have an abundance of air and every inducement given to enable them to properly ripen their growths.

During the season of rest only sufficient water will be required to maintain the bulbs in a plump condition. When any indication of the shrivelling of the bulbs is observed, such plants should be dipped in water, which induces them to plump up readily, and they soon regain their normal condition. The proper maturing or ripening of the growths is one of the principal requirements for the satisfactory flowering and for the future well-being of the plants. It is not desirable to place the plants into heat too soon after they commence to push their flower-buds, as they are sometimes thereby induced to turn their flower-buds into side-shoots. They should be gradually brought into their flowering quarters, and more liberal conditions provided until the flower-buds can be defined, when they should have every encouragement to induce them to expand their flowers.

This section may be easily propagated, if it is desirable to increase the stock, by the cutting off of any of the back bulbs that possess nodes or eyes which have not flowered, and placing them in a basket of sphagnum, or by laying them on cocoa-nut fibre in the propagating case. The breaks are produced from the side eyes: when the breaks get well away, root action commences at the base. They may then be removed by carefully cutting away a small portion of the old bulb with the new growth, and potting them up in the usual way. The potting compost should consist of finely-chopped sphagnum and rough sand. Every encouragement must then be given by heat and moisture to induce a free growth.

The extensive importations of the lovely *D. Phalænopsis* has placed this noble species within the reach of all. The variable characteristics have been enormous, and are now so familiar that they need no description here. *D. Johnsonæ*, the lovely *D. atroviolaceum*, and others, of what may be termed the New Guinea section of Dendrobiums, have also been extensively imported. These must be kept in the warm division throughout the year. Little moisture

Dendrobium—*continued.*

will be required at the roots during the rooting season: only sufficient should be given to maintain the bulbs in a plump condition. With the evergreen section very few additions have been made, and those do well under the conditions previously advised for this class.

To the species, varieties, and hybrids described on pp. 452-8, Vol. I., the following should be added:

D. æmulum (emulous). *fl.* white, fragrant, 1½in. across, the apical half of the segments sometimes stained pale yellow; sepals narrow-lanceolate; petals linear; lip very short, three-lobed, the side lobes acute, spotted pink, the middle one reflexed; racemes terminal, lax, five- to seven-flowered. Stems terete, 2in. to 4in. or more in length, sometimes tapering to a long, thin base with a small pseudo-bulb, and bearing at their summit two or three very coriaceous leaves. Australia. (B. M. 2906; F. A. O., i., part ii. 5; G. C. 1895, i., p. 434.)

D. amboinense (Amboyna). *fl.* in pairs; sepals and petals creamy-white, spreading, nearly 3in. long, linear-lanceolate; lip small, yellowish, edged with dark purple. *l.* terminal, oblong, acute. Stems jointed, bulbiform at the very base, four- to six-angled above. Amboyna, 1856 and 1895. A very singular species. (B. M. 4937; F. d. S. 1211.)

D. amethystoglossum (amethyst-lipped). *fl.* ivory-white, except the amethyst-purple anterior lobe of the lip, crowded, about 1in. in diameter; sepals and petals ovate-oblong, acute; lip elongated, linear-spathulate, apiculate, convex in the middle, incurved at the margins except towards the apex; spur long, obtuse; column exposed; racemes 3in. to 5in. long, many-flowered. January and February. *l.* sessile, oval-oblong, subacute. Stems robust, sometimes 2ft. to 3ft. high and nearly 1in. thick. Philippine Islands, 1872. (B. M. 5968.)

D. anceps (two-edged). *fl.* greenish or yellowish, ½in. long, axillary, very shortly pedicellate; mentum longer than the sepals; lip cuneate-oblong, obscurely three-lobed. *l.* 1in. to 1½in. long, lanceolate or ovate-lanceolate, acute. Stem 1ft. to 3ft. long, stout, flattened. India. SYN. *Aporum anceps* (B. M. 3605; B. R. 1239; L. B. C. 1875).

D. anosmum (scentless). A form of *D. superbum.*

D. Antelope (antelope-horned). *fl.* yellowish; sepals ligulate-triangular, acute; petals long, antenniform, upright, painted sepia inside; lip striped and speckled mauve, the square anterior lacinia having its abrupt apiculus short. Moluccas, 1883.

D. arachnites (cobwebby). *fl.* bright cinnabar-red, in fascicles of two or three, but sometimes solitary, 2½in. across when spread out; sepals and petals linear, acute; lip veined purple, shorter than the other segments, sub-pandurate, convolute over the column at the base; column very short. *l.* linear-lanceolate, acute, 1½in. to 2½in. long. Stems terete, 2in. to 3in. long. Moulmein, 1874. Very rare in cultivation.

D. atropurpureum (dark purple). *fl.* yellowish or pink, about ½in. long, sub-sessile in axillary, shortly peduncled, bracteate heads; mentum as long as the sepals; lip thick. *l.* 1in. to 1½in. long, variable. Stem 4in. to 6in. long. Tenasserim, &c.

D. atroviolaceum (dark violet).* *fl.*, sepals and petals creamy-white, spotted with deep purple; lip violet-purple inside, green outside, three-lobed; spike terminal, erect. Spring. Pseudo-bulbs tapering downwards, persistent, with two or three stout, leathery leaves near the apex. New Guinea, 1890. (B. M. 7371; G. C. 1894, xv., p. 113, f. 12; J. H. 1894, xviii., p. 65, f. 10; W. O. A. x., t. 444.)

D. Augustæ Victoriæ (Augusta Victoria's). A synonym of *D. veratrifolium.*

D. aurantiacum (orange). A synonym of *D. aureum aurantiacum.*

D. aureum album (white). *fl.* very pale, nearly white. A flower of the typical species is shown in Fig. 326.

D. a. aurantiacum (orange). *fl.* orange-yellow. The richest-coloured of all the varieties. SYN. *D. aurantiacum.*

D. a. Henshalli (Henshall's). *fl.*, lip white, suffused yellow at base, where there are two reddish-purple spots. (B. M. 4970, under name of *D. heterocarpum Henshalli.*)

D. a. pallidum (pale). *fl.* sometimes smaller than in the type; lip white, with the exception of a yellow stain at base. Stems longer and slenderer. (B. R. 1839, t. 20.)

D. barbatum (bearded). *fl.* white; lip three-lobed, edged with long, flexuous hairs; racemes terminal, short, four- or five-flowered. Pseudo-bulbs bearing six or seven lanceolate-linear leaves. Birma, 1897. Allied to *D. ciliatum.*

D. bicameratum (twice-arched). *fl.* yellow, with red speckles arranged in stripes, ¼in. broad, crowded on a short, sheathed peduncle; lip golden-yellow. *l.* linear-lanceolate, 3in. to 4in. long, obliquely bifid. Stem clavate, fusiform, or elongate and 1ft. to 1½ft. long. Sikkim Himalaya, 1837. Plant variable (Ref. B. 143.) SYN. *D. brevifforum.*

Dendrobium—*continued.*

FIG. 326. FLOWER OF DENDROBIUM AUREUM.

D. bigibbum albo-marginatum (white-margined). A variety having whitish edges to the flowers. 1892. (L. vii., t. 317.)

D. bracteosum (bracteate). *fl.* purple, with a yellow lip, marked reddish on the front margins, grouped in capitate masses; sepals triangular, keeled, the spur about two-fifths the length of the free part of the lateral sepals, rather blunt; petals narrower, oblong, acute; lip nearly spathulate, a little convex on the upper sides, much thicker at the base; bracts nearly as long as the flowers. New Guinea, 1886. (L. ii. 74.) SYN. *D. chrysolabrum.*

D. breviflorum (short-flowered). A synonym of *D. bicameratum.*

D. brisbanense (Brisbane). A synonym of *D. gracilicaule.*

FIG. 327. FLOWER OF DENDROBIUM BRYMERIANUM.

D. Brymerianum histrionicum (actor). *fl.*, lip having "sometimes a beard, sometimes none, like a comedian." Autumn. A flower of the typical species is shown in Fig. 327.

D. calamiforme (quill-like). A synonym of *D. teretifolium.*

D. Calceolaria (Calceolaria-like). This is the correct name of *D. moschatum.*

D. capillipes (hair-stemmed). *fl.* bright golden-yellow, in short racemes. *h.* 6in. Moulmein. A curious species, resembling a pigmy form of *D. albo-sanguineum.* It succeeds on a block or in a basket. (R. X. O. ii. 169, f. 4-6.)

D. cariniferum lateritium (brick-red). *fl.*, sepals light yellow; petals white; lip brick-red, with a yellowish front lobe. 1883.

D. c. Wattii is now classed as a species.

Dendrobium—*continued.*

D. carnosum (fleshy). *fl.* lined with red, solitary; limb of the lip emarginate. *l.* oblong, rather obtuse, fleshy, mucronate. Pseudo-bulbs two-leaved, oblong, sulcate. Java.

D. chloropterum (green-winged). *fl.*, sepals and petals light green, streaked red outside, and with broken lines of darker colour inside; lip light reddish, with darker lines, the front lobe with a light yellowish border, the callus white; column whitish; peduncle loosely few-flowered *l.* narrow-oblong, bilobed at apex. Pseudo-bulbs fusiform. New Guinea, 1815. (J. B. 1878, 196.)

D. chrysanthum anophthalmum (eyeless). A distinct variety, having no blotch on the lip, such as are seen in the type. 1883.

D. chryseum (golden). *fl.* golden-yellow, almost orange, with a few faint crimson lines on the side lobes of the lip, solitary or in racemes of two or three; sepals oblong; petals broadly elliptic, almost as broad again as the sepals; lip orbicular, pubescent, with a minutely fimbriated margin, obscurely three-lobed, the small side lobes rolled over the very short column; spur short, obtuse. *l.* from the uppermost joints only, linear-lanceolate, 3in. to 4in. long. Stems terete, erect, 1ft. to 2ft. high. Assam and Bhotan.

D. chrysocephalum (golden-headed). *fl.* deep golden-yellow, otherwise closely resembling *D. viridi-roseum*; racemes densely many-flowered, capitate. Stems nearly terete, of a pleasing green. Habitat not recorded, 1892.

D. chrysocrepis (golden slipper). *fl.* golden-yellow, with a deeper lip, 1½in. in diameter, solitary on short, slender peduncles from old, leafless stems; dorsal sepal and petals similar, obovate, concave; lateral sepals ovate, more spreading; lip somewhat pear-shaped, ventricose, velvety, the inner surface densely clothed with reddish hairs. March. *l.* three or more, elliptic-lanceolate, pointed. 2in. to 3in. long. Stems slender, 6in. to 10in. long, dilated above into flattened, leafy pseudo-bulbs. Moulmein, 1871. (B. M. 6007.)

D. chrysolabrum (yellow-lipped). A synonym of *D. bracteosum.*

D. chrysotis. The correct name is *D. Hookerianum.*

D. chrysotoxum suavissimum (very sweet-scented). The correct name of *D. suavissimum.*

D. ciliatum (ciliated). *fl.* 1in. across, many in pseudo-terminal and lateral racemes; sepals and petals pale yellow, the former linear-oblong, the lateral two falcate, the petals linear, dilated at apex; lip deep yellow, streaked obliquely with reddish-brown from either side of the trilamellate disk, obscurely lobed, triangular, incurved at the sides, the anterior lobe yellow-ciliate. October and November. *l.* sessile, oval-oblong, gradually narrowing upwards, 3in. long, deciduous. Stems tufted, 1ft. to 1½ft. or more in length. Moulmein, 1863. (B. M. 5430; W. O. A. 454.)

D. cœleste (celestial-blue). *fl.* described as "dark blue, fleshy, with the ovary and spur purple"; sepals and petals ovate, sub-equal; lip obovate, blunt. Philippines (?), 1897.

D. Cœlogyne (Cœlogyne-like). *fl.* very large; sepals and petals yellowish, mottled with red, the sepals 2½in. long, acuminate; the petals narrower; lip deep dull purple, the side lobes narrow, the midlobe trapezoid-ovate. *l.* broadly elliptic-oblong, notched, 3in. to 6in. long, very coriaceous. Pseudo-bulbs very stout, 1½in. to 2in. long. Moulmein, 1894.

D. cœrulescens (bluish). A variety of *D. nobile.*

D. compressum (compressed). A synonym of *C. lamellatum.*

D. cruentum (blood-red). *fl.* whitish, with a strongly-marked cinnabar callus; sepals triangular, acuminate, the lateral ones with a nearly rectangular chin; petals linear, acuminate; lip deeply trifid, the side laciniæ falcate, erect, the middle one ovate, apiculate; column broader at the base than at the tridentate top. *l.* oblong, obtuse, bilobed. Stems sulcate. Malaya, 1884. (W. O. A. 174.)

D. crumenatum (pocket-like). *fl.* white, 1in. to 1½in. long, many on the leafless ends of the branches; mentum equalling the lateral sepals; lip having a primrose disk and sometimes pink veins. *l.* 2in. to 3in. long, oblong, obtuse, notched. Stem 2ft. to 3ft. high, stout, fusiform at base. Tenasserim, &c., 1823. (B. M. 4013.)

D. cucullatum is a variety of *D. Pierardii.*

D. c. giganteum (gigantic). A synonym of *D. primulinum giganteum.*

D. cucumerinum (Cucumber-like). *fl.*, sepals and petals yellowish-white, streaked with reddish-yellow, about ½in. long; lip shorter. *l.* terminal, fleshy, above 1in. long, about as thick as the stem, ribbed, resembling a little cucumber. Stems tufted, less than 1in. long. New South Wales, 1841. (B. M. 4619; B. R. 1843, t. 37.)

D. cumulatum (crowded). *fl.* rosy-purple, suffused white, 1in. in diameter, collected into crowded, sub-globose corymbs; sepals and petals oblong; lip obovate-oblong, longer and broader than the petals, prolonged at base into a slightly curved, obtuse spur; rachis and pedicels deep reddish-purple. Autumn. *l.* oblong, acuminate, 3in. to 4in. long. Stems tufted, slender, pendulous, 1½ft. to 2ft. long. Moulmein, 1867. (B. M. 5703.)

Dendrobium—*continued.*

D. Curtisii (Curtis'). *fl.* magenta-rose, produced in short racemes. Stems tall, erect, slender, leafless; younger shoots furnished with linear-lanceolate leaves. Borneo, 1882.

FIG. 328. DENDROBIUM DEAREI.

Dendrobium—*continued.*

D. Dalhousieanum is identical with *D. pulchellum.*

D. Dearei (Col. Deare's).* *fl.* white, 2½in. in diameter, on whitish pedicels; sepals lanceolate, acuminate, with recurved tips; petals oval, nearly three times as broad as the sepals; lip oblong, obtuse, obscurely three-lobed, with a pale yellowish-green, transverse zone between the base and the anterior margin; peduncles racemose. July and August. Stems robust, 2ft. to 3ft. long, the upper part clothed with sessile, oval-oblong leaves, 2in. long. Philippine Islands, 1882. (M. O. iii., p. 37; W. O. A. iii. 120.) See Fig. 328.

D. densiflorum albo-luteum. The correct name is *D. thyrsiflorum.* The typical *D. densiflorum* is shown in Fig. 329.

D. denudans (naked). *fl.* usually white with red veins on the lip, sometimes yellowish with a green lip, ⅝in. to 1in. long; sepals and petals slender; lip much shorter; raceme (with scape) 4in. to 6in. long, drooping, many-flowered. *l.* 3in. to 6in. long, caducous. Stems 4in. to 6in. long, sub-erect, clothed with broad sheaths. Sub-tropical and temperate Himalayas, 1897. (B. M. 7543.)

D. dicuphum (doubly bent). *fl.* pink or purple, three or four in an erect raceme; sepals acuminate, seven to eight lines long; petals rather longer and broader; lip nearly as long, the disk having three raised longitudinal lines; peduncle 6in. to 12in. long. *l.* few on the upper part of the stem, 3in. to 6in. long. Stems 3in. to 4in. long or shortened into a conical pseudo-bulb. North Australia, 1895. Resembles a miniature *D. Phalænopsis.*

D. Diodon (two-toothed). A small-flowered, Cingalese species, of more botanical than horticultural interest, in cultivation at Kew.

D. discolor (versicoloured). A synonym of *D. undulatum.*

D. curviflorum (curved-flowered). *fl.* white, 1⅜in. long, axillary, solitary, with a faint pink suffusion on the back of the sepals and a yellow line down the centre of the lip terminating in a deep blotch in front. *l.* 1½in. to 1⅝in. long, lanceolate, fleshy. Stems terete, 6in. long. Himalayas, 1895.

D. cymbidioides (Cymbidium-like). *fl.* medium-sized, showy; sepals and petals ochreous-yellow, linear-oblong, spreading; lip white, blotched purple near the base, much shorter than the sepals and petals, oblong-cordate, three-lobed, bearing on the disk tubercles arranged in two or three lines or series, the side lobes short, incurved, the terminal lobe ovate, obtuse; column short; peduncles terminal, erect, loosely racemose, five- to seven-flowered. Pseudo-bulbs ovate or oblong-ovate, angled, bearing at the summit two oblong, obtuse, coriaceous leaves, longer than the pseudo-bulbs. Salak, Java, 1852. A rare species. (B. M. 4755; G. C. 1896, xix., p. 581, f. 90.)

D. cymbiforme (boat-shaped). *fl.* straw-yellow, a little whiter on the petals, with about five purple stripes on each of the sepals and petals (which are about ½in. long), and similar lines at the apex of the flabellately-dilated lip; raceme axillary, two-flowered. April. *l.* oblong-lanceolate, 2in. to 2½in. long. Stems terete, slender, 6in. to 12in. long. Sumatra, 1896.

D. dactyliferum (finger-bearing). *fl.* ochreous-white; sepals lanceolate, longer than the petals; side laciniæ of the lip long and narrow, going out into angles, quite approximate to the thick, square, emarginate, anterior blade. Upper parts of the stems covered with old, thickish peduncles, the lower parts full of roots. Habitat unknown, 1884.

D. D'Albertisii (D'Albertis'). *fl.* odorous, distinctly spurred; sepals pure white; petals emerald-green, long, narrow, erect, twisted; lip striped magenta-purple; racemes erect. Stems square, tapering. New Guinea. A dwarf species. (G. C. n. s., x., p. 217.)

D. erythropogon (red-bearded). *fl.* whitish-ochre and ochre, the keels on the mid-lines well-developed; petals oblong, undulated; side laciniæ of lip white, edged crimson, much developed, blunt, rectangular, the middle one obcordate, toothleted, with seven thick, crimson keels on the disk, the two outer ones having short, crimson keels on each side; column nearly white, with two scarlet spots at base. Sunda Islands, 1885.

D. Fairfaxii (Fairfax's). *fl.* white and green, purple on the lip; racemes terminal, 4in. long. Pseudo-bulbs 3in. to 4in. long. New Hebrides, 1889. A small plant.

FIG. 329. DENDROBIUM DENSIFLORUM.

Dendrobium—*continued.*

D. Farmeri albiflorum (white-flowered). *fl.*, sepals and petals almost pure white; lip orange, downy. India. (B. H. 1860, p. 321.) SYN. *D. F. album* (R. G. 595).

D. F. album (white). A synonym of *D. F. albiflorum.*

D. F. aureum (golden).* *fl.* clear yellow, with an orange-yellow lip, freely produced in rich racemes. Moulmein, 1883. A charming variety, of dwarf habit. (W. O. A. iii. 99.)

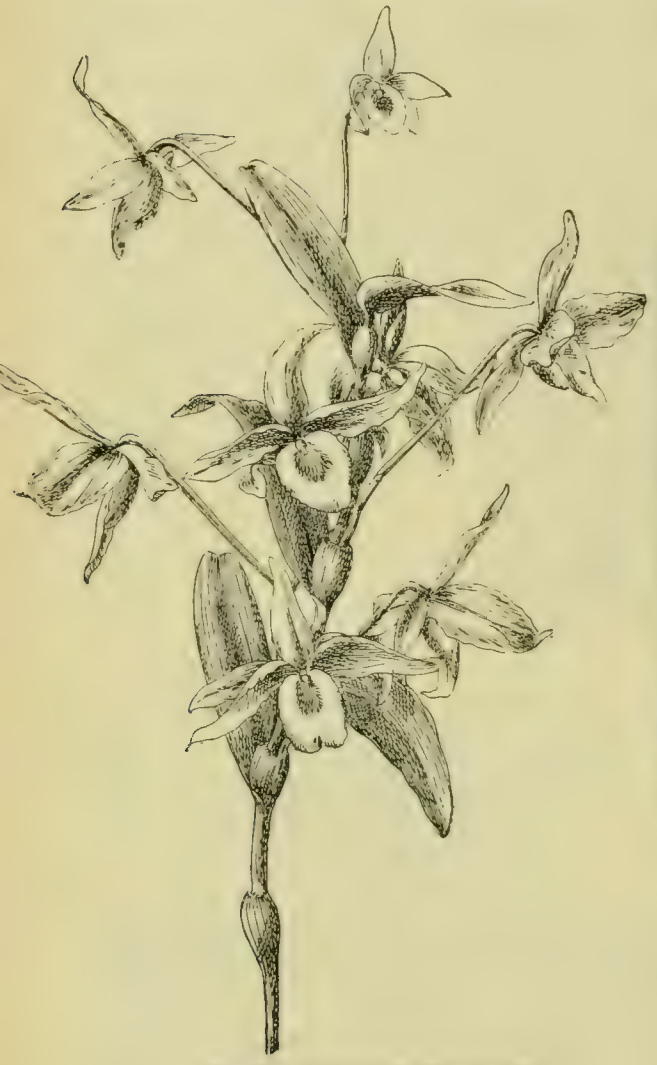

FIG. 330. DENDROBIUM FINDLAYANUM.

D. Findlayanum. An illustration of this erect species is given in Fig. 330.

D. Flabellum (fair). A synonym of *D. Macræi.*

D. formosum Berkeleyi (Berkeley's). *fl.* scentless, more funnel-shaped than those of the type; petals narrower and shorter. Andamans, 1883.

D. f. giganteum (gigantic).* *fl.* 6in. in diameter; lip 2in. broad, with a bright golden blotch. Stems reaching 3ft. in length. Upper Birma, 1882. A very fine variety. See Fig. 331. (G. C. n. s., xvii., p. 369.)

D. fragrans (fragrant). *fl.* creamy-white, small, rounded. Pseudo-bulbs numerous, slender. Habitat not recorded, 1896. A species of little horticultural value.

D. Freemani (Freeman's). A variety of *D. lituiflorum.*

D. Friedricksianum (Friedricks'). *fl.* light yellow, with a darker yellow centre to the lip, where there is a dark purple, semi-circular blotch, resembling those of *D. aureum* in shape; lip rolled around the column, oblong, full of asperities on the disk, and with a clavate line in front of the base; raceme four-flowered, slender. Stem rather thick, much-furrowed. Siam, 1887.

D. fuscatum (fuscous). A synonym of *D. Gibsoni.*

D. Fytchianum roseum (rose-coloured). *fl.* rose-coloured, about 1½in. in diameter, having processes on the lip of a rich purple. Birma, 1887. (W. O. A. 336.)

D. Galliceanum (Gallice's).* *fl.* white with a yellow lip, resembling those of *D. thyrsiflorum*; petals much broader than the sepals, slightly crisped on the margins; lip very broadly cordate-ovate, with a fringed margin. Birma, 1890. A beautiful plant. (L. vi., t. 241.)

D. glomeratum (clustered). *fl.* disposed in short, dense, axillary racemes, with large, imbricating bracts; sepals and petals bright rose-colour; lip orange. Stems 2½ft. long. Moluccas, 1894. Allied to *D. cumulatum*, but having larger flowers. (G. C. 1894, xv., p. 653, f. 80.)

D. glomeriflorum (clustered-flowered). *fl.* of a pale rose-colour, small and insignificant, disposed in dense clusters of five or less on each stem. Habitat not recorded, 1895.

FIG. 331 FLOWER OF DENDROBIUM FORMOSUM GIGANTEUM.

D. Goldiei (Goldie's). A variety of *C. superbiens.*

D. gracilicaule (slender-stemmed). *fl.* of a dingy yellow spotted with red, the spur or pouch shorter, broader, and more curved, and the racemes shorter, than in *D. Kingianum* (which this species closely resembles in habit). *l.* rather more rigid and broader. Australia, 1889. (B. M. 7042.) SYN. *D. brisbanense.*

D. Greatrixianum (Greatrix's). This is described as "a pretty, slender species, with white flowers and a large ovate labellum having a blotch of purple at the base and apex." New Guinea, 1897.

D. Griffithianum Guibertii (Guibert's). *fl.* larger and brighter-coloured than in the type; racemes longer. *l.* more coriaceous. Stems less densely tufted and more abruptly attenuated below. (I. H. ser. iii. 258; R. H. 1876, p. 431, under name of *D. Guibertii.*)

D. Guibertii (Guibert's). A variety of *D. Griffithianum.*

D. hamatum (hooked). *fl.* 1½in. wide, disposed in terminal, many-flowered racemes; sepals and petals pale yellow, with lines of purple dots; lip yellow, pandurate, with a purple stain on the front lobe. *l.* oblong, acuminate, 5in. long. Stems slender, 2ft. long. Cochin China, 1894.

D. Hanburyanum (Hanbury's). A synonym of *D. lituiflorum.*

D. Harrisoniæ (Mrs. Harrison's). A synonym of *Bifrenaria Harrisoniæ.*

D. Harveyanum (Harvey's). *fl.* deep chrome-yellow, with two orange blotches on the lip; chin short, emarginate; sepals triangular-lanceolate, acute; petals oblong, acute, fringed; lip round, a little involved at base, with strong fringes, a rough surface, and an obscure callus at base; peduncle lateral, filiform, four-flowered. Pseudo-bulbs fusiform, 6in. long. Birma, 1883. (G. C. 1894, xvi., p. 593, f. 76.)

D. Hasseltii (Hasselt's). *fl.* pale purple; dorsal sepal lanceolate, the lateral ones connate in a sac; lip linear, acute. *l.* rigid,

Dendrobium—*continued.*

lanceolate, deeply and obliquely emarginate. Stems erect. Java (?), 1885. (I. H. 1885, 545.)

D. Henshallii (Henshall's). A variety of *D. aureum.*

D. hercoglossum (fence-lipped). *fl.* similar to those of *D. aduncum*, but with a more oblique spur; sepals and petals delicate mauve; lip white, with a mauve-purple, recurved apex, the basal part cup-shaped, hairy inside, separated from the front part by a transverse fringe of hairs. Stems slender, bearing lateral racemes at the top. Malacca, 1886.

D. Hildebrandii (Hildebrand's). *fl.* 3in. across; sepals and petals pale dull yellow, twisted; lip orange, short, roundish; racemes numerous, axillary. *l.* 5in. long, 1½in. wide. Stems 2ft. long. Birma, 1894. Cultivated plants of this species, which is allied to *D. tortile*, exhibit some variation in colour. (B. M. 7453.)

D. Hillii (Hill's). A variety of *D. speciosum.*

D. hirtulum (slightly hairy). *fl.* bright yellow, streaked with reddish-brown at the sides of the lip; sepals and petals about ½in. long; disk of the lip wholly villous; racemes lateral, short, three- or four-flowered. *l.* oblong or linear-oblong, 1½in. to 2½in. long. Stems terete, 9in. to 13in. long. Birma (?), 1898.

D. Hookerianum (Hooker's). The correct name of *D. chrysotis.* (I. H. 1873, 155; W. S. O. iii. 6.)

D. Huttoni (Hutton's). *fl.* white, bordered purple, solitary or in fascicles of two or three from the uppermost joints; sepals and petals oval-oblong; lip obovate-oblong, with a deeper-coloured border than on the sepals and petals. *l.* sessile, linear-lanceolate, acute, 3in. long. Stems slender, erect, 20in. to 30in. long, leafy along the upper half. Malayan Archipelago, 1868.

D. Imperatrix.* This species is the largest of the genus, and comes near to *D. Augustæ Victoriæ.* It has stems 7ft. high, and they bear relatively small leaves. The flowers are borne as many as forty on a spike on the leaf-axils of two-years-old stems and upon flower-stalks about 2ft. long. It is a native of New Guinea.

D. inauditum (incredible). *fl.* two, arising from the base of the leaf; sepals and petals pale yellowish, 1½in. long, narrow linear-lanceolate; lip pale ochreous, spotted brown, the side lobes square, obtuse, the front one lanceolate, acuminate; pedicels (including the ovary) about 2in. long. *l.* elliptic, obtuse. Pseudo-bulbs tufted, fusiform-ovate, narrowed at apex into a slender brownish leaf-stalk 3in. to 4in. long. New Guinea, 1886. A singular species.

D. inflatum (inflated). *fl.* white, about 1in. long, with a yellow blotch on the lip, disposed in short, few-flowered racemes. *l.* 1in. long. Stems slender, 6in. long. Java, 1895. A species of the section *Pedilonium.*

D. infundibulum carneo-pictum (flesh-colour-painted). A variety having a flesh-coloured hue on the lip, and a thick central line and a few streaks on the sides. 1885.

FIG. 332. DENDROBIUM INFUNDIBULUM JAMESIANUM.

D. i. Jamesianum (James Veitch's). The correct name of *D. Jamesianum.* See Fig. 332.

Dendrobium—*continued.*

D. i. ornatissimum (very ornamental). *fl.* large, waxy, having brown stripes and spots on the lip instead of yellow. 1883. A grand variety.

D. inversum (inverted). *fl.* orange-scarlet; sepals and petals linear; lip narrow, broadest in the centre, veined with deep scarlet. Habitat not recorded, 1895. A very dwarf species.

D. ionopus (purple-spurred). *fl.* deep yellow; sepals triangular, the lateral ones elongating in a falcate chin; lip marked with a few purple and red blotches, and with a red hue along the thicker back of the falcate, spur-like extension of the disk; raceme short. Birma, 1882.

D. Jamesianum is a form of *D. infundibulum.*

D. japonicum (Japanese). A synonym of *D. moniliforme.*

D. Jennyanum (Zollinger-Jenny's). *fl.* yellowish outside, brown and varnished inside, having untwisted segments and a broad three-lobed lip; otherwise closely resembling *D. undulatum* except in size. Australia (?), 1896.

D. Johannis semifuscum (half-fuscous). *fl.*, sepals yellow; petals brown; lip yellow, with reddish-brown borders and lines on the side lobes. 1883.

D. Johnsonæ (Mrs. Johnson's).* *fl.* 4in. to 5in. across; sepals and petals white, the former lanceolate, the latter longer and broader, sub-rhomboidal, acuminate; lip nearly as long as the petals, three-lobed, the side lobes white, with a large, purple spot at the anterior margin, the middle lobe white, purple at base, as is the ligulate, furrowed callus; column white, bordered purple; racemes ascending, nine to twelve or more flowered. *l.* oblong, sub-acute, leathery, 3in. to 4in. or more in length. Stems erect, sub-cylindric, 5in. to 8in. high, usually two- or three-leaved. Papua, 1882. (R. ser. ii., t. 61.) SYN. *D. Macfarlanei* (J. H 1890, xx., p. 177, f. 26; M. O. iii., p. 159).

D. Kingianum album (white). *fl.* pure white; racemes many-flowered, about 1ft. long. Pseudo-bulbs about 6in. long. Australia, 1888.

FIG. 333. FLOWER OF DENDROBIUM MACCARTHIÆ.

D. Kuntsleri (Kuntsler's). *fl.* solitary, white, mottled with red, 1in. long, very membranous; sepals and petals lanceolate, acuminate; midlobe of lip ⅝in. across. *l.* elliptic-lanceolate, 6in. to 10in. long, 2in. to 3½in. broad, very coriaceous. Pseudo-bulbs 2in. to 3in. long, fusiform; branches long, stout. Perak.

D. lamellatum (lamellate). *fl.* yellow, white, or pale pink, ¾in. long, three to five in a short, drooping raceme; lip clawed, truncate. *l.* few, ovate, 1in. to 1½in. long. Pseudo-bulbs pyriform, 3in. to 4in. long, proliferously branched. Tenasserim, 1892. (I. H. 1892, t. 157.) SYN. *D. compressum* (B. R. 1844, t. 53).

D. Leeanum (Lee's).* *fl.* about 1in. across; sepals and petals white, mottled with warm rose-purple in the upper half; lip very deep purple, tinged with green at the base of the throat. Stems very tall, slightly compressed. New Guinea, 1891. Not unlike *D. superbiens* in habit and form of flower.

D. leucolophotum (white-crested). *fl.* white, resembling those of *D. barbatulum*, but much larger; chin small, acute; sepals ligulate, acute; petals much larger, oblong, acute; lip trifid, the side laciniæ triangular, rounded outside, the anterior one linear-ligulate, acute; inflorescence lax, more than 1ft. long. *l.* oblong-ligulate, acuminate. Stems cylindrical, attenuated, many-leaved. Sunda Islands, 1882.

D. leucopterum (white-winged). A variety of *D. euosmum.*

D. lineale (lineal). *fl.*, sepals and petals creamy-white; lip veined with purple on the inner face; racemes about 1ft. long. Stems 2ft. high. New Guinea, 1889. Allied to *D. canaliculatum.*

D. lincarifolium (linear-leaved). *fl.* white; upper sepals small, oblong, acute, the lateral ones having two mauve-purple lines;

Dendrobium—*continued.*

petals very small, nearly rhombic; lip cuneate-dilated, or blunt-retuse or trilobed at apex with rhombic side lobes and a retuse middle one, the side lobes veined purplish-mauve. *l.* linear, bidentate, more than 2in. long. Stem thin, slender, bearing numerous branches. Java, 1833

D. Linguella (small tongue). *fl.* probably rosy, the anterior part of the lip yellow, closely resembling those of *D. aduncum*, but the lip is totally distinct in its double, lamellar appendages at the base. Malayan Archipelago, 1882.

D. Loddigesii (Loddiges'). A synonym of *D. pulchellum.* (B. i. 5; L. B. C. 1935.)

D. Lowii pleiotrichum (many-haired). A variety wanting the red veins on the lip, and having short hairs on the basal lobes. 1885.

D. luteolum chlorocentrum (yellowish-spurred). *fl.* pale primrose, having greenish hairs on the disk of the lip. 1883. (G. C. n. s., xix., p. 340.)

D. MacCarthiæ. A flower of this Cingalese species is shown in Fig. 333.

Dendrobium—*continued.*

D. macrophyllum (of Lindley). A synonym of *D. superbum.*

D. macrostachyum (large-spiked). *fl.* yellow, fragrant, 1in. long, two or three on a short peduncle; sepals and petals recurved, sometimes tinged with pink; lip veined with purple. *l.* 3in. to 4in. long. Stems 1ft. to 2ft. long, pendulous, rather slender. Travancore, &c. (B. R. 1865.)

D. marginatum (margined). A synonym of *D. xanthophlebium.*

D. McGregorii (Sir Wm. McGregor's). *fl.* three or four to a stalk; sepals white, blotched with rose-purple; petals white, with a rose-purple line; lip having two large, blood-purple side lobes and a yellow or orange, purple-veined, reniform middle lobe. *l.* two or three, oblong-lanceolate. *h.* 8in. Habitat not recorded. Perhaps not yet in cultivation.

D. mesochlorum (green-centred). A synonym of *D. amœnum.*

D. Mettkeanum (Lieut. Mettke's). *fl.* pale rose-coloured; sepals and petals narrowed to thin, filiform tails; lip also very narrow, with rounded side lobes and a lanceolate middle one. *l.* linear, narrowed at base, bilobed. *h.* 10in. Habitat not recorded, 1894.

D. Mirbelianum (Mirbel's). *fl.* about a dozen in an erect raceme more than 1ft. long; sepals and petals greenish-yellow, with darker lines, narrow, acute, the petals 1½in. long; oblong side lobes of the lip enclosing the column; greenish-yellow with brown lines, the ovate, acute front lobe having a pale disk and the borders veined with brown. *l.* elliptic. Stems stout, 18in. to 20in. long. New Guinea, 1890. (L. v., t. 215.)

FIG. 334. DENDROBIUM NOBILE.

D. Macfarlanei (Rev. S. M. Macfarlane's). A synonym of *D. Johnsonæ.*

D. Macræi (Macrae's). *fl.*, sepals and petals ochre, spotted dark purple; lip having a very long stalk, with two long, wavy, plicate keels, the front lobe pentagonal, both sides running backwards, producing a sagittate appearance. Stem climbing, covered with narrow, ligulate, one-leaved pseudo-bulbs. India, 1885. SYNS. *D. Flabellum* (R. X. O. ii., t. 118), *D. pardalinum.*

D. macranthum (large-flowered). A synonym of *D. superbum.*

D. macrophyllum Dayanum (Day's). A superior variety. Borneo.

D. m. giganteum (gigantic). *fl.* solitary or twin, 4in. in expanse; sepals and petals rosy-mauve, tinted lilac, the eye (as well as the fringed lip) rosy-purple. Manilla, 1886.

D. m. stenopterum (narrow-winged). *fl.*, sepals and petals ochreous-yellow, with dark reddish-brown spots outside; lip yellow, with numerous dark brown dots on the outside and rather pale markings on the inside of the mid-lacinia, the side laciniæ marked with a few brown lines, and narrow-triangular instead of irregularly square.

D. moschatum. The correct name is *D. Calceolaria.*

D. moulmeinense (Moulmein). A synonym of *D. infundibulum.*

D. niveum (snowy).* *fl.* snow-white with the exception of a few radiating light brown nerves on the base of the side lobes of the lip, and a few light green ones near the tooth on the disk, 4½in. across when expanded. New Guinea, 1889. A distinct and beautiful species.

Dendrobium—*continued.*

D. nobile album (white).* This variety resembles *D. n. virginale*, but without the primrose disk. A fine plant of the typical species is shown in Fig. 334.

D. n. Amesiæ (Mrs. Ames). This is a variety with very pale tips to the sepals, petals, and tip of the lip. The disk is exceedingly dark.

D. n. Cooksonianum (Cookson's).* *fl.*, middle area of the petals very deep purple, their tips with purple borders; bases of the petals hastate, thickened in the middle and velvety. 1885. A grand variety.

FIG. 335. DENDROBIUM PENDULUM.

D. n. elegans (elegant). *fl.* larger and more symmetrical than in the ordinary forms; petals broader, white at the base; zone surrounding the maroon disk of the lip pale sulphur-yellow, the apical margin rose-purple.

D. n. Sanderianum (Sander's). *fl.*, sepals and petals purple, the latter white at base; disk of lip covered by a dark blotch, which is surrounded by rosy-purple, except a small white area in front, veined purple, and with a white border to the superior part. 1884.

D. n. virginale (virgin-white). *fl.* pure white with the exception of a tinge of pale primrose on the lip. 1897.

D. nycteridoglossom (dark-lipped). *fl.* produced in fascicles on the upper and ultimately leafless part of the stem; sepals and petals green, striped very dark red; lip green, with a dark spot on the disk, broad, triangular side lobes, and a very short, retuse central lobe. Papua, 1886.

D. Palpebræ (eyelids). *fl.* French white, with an orange-yellow disk near the base of the lip, faintly scented like Hawthorn; sepals oblong, narrower than the oval sepals; lip oblong, with a short, convolute claw, downy above, and with a fringe of long hairs near the base; column yellowish; racemes loose, six- to ten-flowered, produced from the joints immediately below the leaves. Late summer. *l.* oblong-lanceolate, acute. Stems clavate, four-angled, attenuated below, 7in. to 9in. long, with three to five leaves at their summit. Birma, 1849.

D. Papilio (butterfly). *fl.* large, solitary, fragrant, pendent; sepals and petals pale rose-coloured; lip yellow, veined with purple, long-unguiculate, wavy. *l.* linear, channelled to the base. Stems thin and grass-like. Philippine Islands (?), 1890. Allied to *D. cruentum.*

D. pardalinum (leopard-spotted). A synonym of *D. Macræi.*

D. Parishii albens (whitish). *fl.* white, with a blotch of crimson-purple just within the throat of the lip. 1891. A free, graceful, and delicate variety.

D. Parthenium (Parthenium). *fl.* white, with a purple blotch at the base of the lip; sepals lanceolate-triangular, with obscure keels; petals oblong, obtuse, longer than the sepals; racemes two-flowered. *l.* 1½in. long. Stems thin. Borneo, 1885.

Dendrobium—*continued.*

D. Paxtoni (Paxton's), of Lindley. A synonym of *D. chrysanthum.*

D. pendulum (pendulous). The correct name of *D. Wardianum.* See Fig. 335.

D. p. assamicum (Assam). *fl.* smaller but more brilliantly coloured than in the type. *l.* narrower. Stems shorter and slenderer. (B. M. 5058, under name of *D. Falconeri* var.)

D. p. giganteum (gigantic).* *fl.* larger and stouter than those of the type. Winter and spring. *h.* sometimes 5ft. Birma. A grand variety. (W. O. A. iii. 113; F. M. ser. ii. 212, under name of *D. Wardianum giganteum.*)

D. percnanthum (black-spotted-flowered). *fl.*, sepals and petals pale yellow, the former triangular, the chin blunt, the petals oblong, obtuse, longer than the sepals; lip white, ligulate, trifid at apex, the mid-lobe and borders of the upper part yellow, the side lobes blunt-rhomboid, the keels brown and purple; racemes numerous. Stems strong, shining. Moluccas, 1886.

FIG. 336. INFLORESCENCE OF DENDROBIUM PHALÆNOPSIS.

D. Phalænopsis (Phalænopsis-like).* *fl.* about 2in. in diameter; perianth spreading; sepals pale pink, with reticulated nerves; petals rose-red, much larger, rhomboid-orbicular, acute; lip dark purplish-blood-red, the lateral lobes rounded, the middle one tongue-shaped; raceme loosely six- to ten-flowered; September. *l.* alternate, distichous, 6in. to 8in. long. Stems tufted, 1ft. to 1½ft. high. North Australia and New Guinea. See Fig. 336. (B. M. 6817; G. C. n. s., xxvi., p. 556; L. 280; R. 42; W. O. A. iv. 187.)

D. P. hololeuca (wholly white). *fl.* pure white. 1895. (G. C. 1895, xviii., pp. 192, 396, f. 72.)

D. P. Rothschildianum (Rothschild's). *fl.* 4in. broad; sepals and petals snow-white; lip light pink, with darker lines on the disk. 1892.

D. P. Schröderianum album (Baron von Schröder's white). *fl.* pure white, with the exception of some purple lines in the throat. 1894.

Dendrobium—*continued.*

D. platycaulon (broad-stemmed). *fl.* straw-coloured, upwards of 1in. long, larger than in *D. lamellatum* (which this species resembles), and differing in the shape of the lip. Philippine Islands, 1892.

D. plicatile (plaited). *fl.* dull yellow, slightly tinged with red, rather large, solitary; lip curiously plaited. Philippine Islands.

D. pogoniates (bearded). *fl.* small; sepals and petals yellowish, the former lanceolate, acute, the latter cuneate-oblong; lip orange, with a long mid-lobe, bearded. *l.* linear-lanceolate. Stems fusiform, 1ft. high. North Borneo, 1886. A miniature plant, of more botanical than horticultural interest.

D. polycarpum (many-fruited). *fl.* yellowish, with purplish-red borders to the side laciniæ; sepals ligulate-triangular; petals longer, ligulate-spathulate; lip having roundish, angulate side laciniæ, and a rounded, triangular, undulated central one; racemes many-flowered, loose. Stems 3ft. long. Sunda Islands, 1883.

D. primulinum giganteum (gigantic). *fl.* white, tipped pink, with a sulphur lip, very large, freely produced. Sikkim. A fine variety. SYN. *D. cucullatum giganteum.*

D. profusum (profuse). *fl.*, sepals and petals yellowish-green, with fine purple at the base inside, and purple dots on the toothed petals, the sepals ligulate, acute; lip yellow, with a dark spot in the middle, the blade pandurate, the anterior part very broad, toothleted and wavy; peduncles seven- to nine-flowered. *l.* deciduous. Philippine Islands, 1834.

FIG. 337. FLOWER OF DENDROBIUM PULCHELLUM.

D. pulchellum. SYNS. *D. Dalhousieanum, D Loddigesii.* A flower of this species is shown in Fig. 337.

D. pumilum (dwarf). *fl.* white, cream-coloured, or yellow, 1in. long, solitary, shortly pedicellate; lip having a dark spot at the tip or veined with red. *l.* ½in. to ¾in. long, orbicular to elliptic, obtuse. Pseudo-bulbs of one many-grooved internode 1in. to 1½in. long. India. (T. L. S. xxx., t. 31, f. A.)

D. punctatum (dotted). A synonym of *Wailesia* (*Dipodium*) *punctata.*

D. purpureum (purp e). *fl.* bright purple, about ¾in. long, cylindrical, arranged in dense, spherical, sessile clusters, which are produced from the nodes of the old, leafless, spindle-shaped stems, of many years' duration, and usually 3ft. to 4ft. long; bracts cordate. Moluccas, 1834.

D. p. candidulum (whitish). *fl.*, tips of the sepals very bright green; ovary pure white, stalked. 1837. (L., t. 98.)

D. p. Moseleyi (Moseley's). *fl.* white, tipped green, the tips of the sepals and petals less pointed than in the type; bracts ovate, acuminate. Stems 9in. (? or more) long. Arn Islands, 1884.

D. revolutum (revolute). *fl.* solitary, axillary, ¾in. long; sepals and petals white, reflexed upwards, lanceolate, acute, nearly equal; lip bright yellow-green, nearly quadrate, convex; disk with three furrows and red bands; bracts caducous. July. *l.* numerous, distichous. 1in. to 2in. long, oblong or linear- or

Dendrobium—*continued.*

ovate-oblong, obtuse or retuse, half-amplexicaul. Stems tufted, 1ft. long. Malay Peninsula, 1882. This species is not very handsome. (B. M. 6706.)

D. rhodopterygium Emerici (Emeric's). "A white line runs outside the mid-vein of the lateral sepals. The dark transverse blotch on the anterior area of the lip is interrupted by an amethyst-coloured bar. The anterior, apiculate border is pure white, changing then to straw-colour." Reichenbach, from whose description above is copied, placed this plant as a variety under *D. polyphlebium.*

D. rhombeum (rhomboid). A synonym of *D. aureum.*

D. Rimanni (Rimann's). *fl.* equalling those of a good *D. speciosum*, disposed in terminal, somewhat zigzag racemes; sepals and petals yellow, the former striped purple outside; lip white, with purple reticulations. *l.* oblong, 3½in. long, very coriaceous. Stems cylindric-fusiform, leafy above. Moluccas, 1883. A stately species.

D. robustum (robust). *fl.* yellowish-green, marked with purple lines. Stems 2ft. long. New Guinea, 1895. This species is closely allied to *D. Mirbelianum*, but has less acute segments and smaller bracts.

D. rutriferum (shovel-bearing). *fl.*, sepals rose, triangular, blunt, the lateral ones extended into a long pouch; petals rose at the base, whitish at the blunt end; lip ligulate-pandurate, with inflexed borders, thus being saccate at apex, where the borders are denticulate; rachis rather short, covered with a capitate-umbellate inflorescence. Stem furrowed, as thick as a goose-quill. Papua, 1887. (L. iii. 119.)

D. Sanderianum (Sander's). This species most closely resembles *D. Dearei*, but has larger flowers, and the lip is stained with purple instead of green at the base; they are borne in axillary clusters of two or three. Borneo, 1894.

D. sanguineum (blood-coloured). *fl.* solitary in the upper axils, about 1in. long; sepals and the broader petals crimson, except at the base in front, where they are marbled and spotted with crimson on a whitish ground; lip whitish, small, with some purple lines and spots. Stems slender, about 3ft. long. Labuan, 1895.

D. sarmentosum (sarmentose). *fl.* 1in. across, solitary or two or three together, produced after the leaves; sepals and petals white; lip white, with a yellow blotch and a few lines of crimson at the base. Stems very slender, 1½ft. long, branched. Birma, 1897. This species has the habit of, and is closely allied to, *D. barbatulum.* (B. M. 7527.)

D. Schröderi (Baron von Schröder's). An albino form of *D. densiflorum.*

D. secundum niveum (snowy) *fl.* white, with the exception of an orange tip to the lip. Stem shorter than in the common form.

D. signatum (preserved). *fl.*, chin very blunt-angled; sepals sulphur, ligulate, acute, reflexed; petals white to lightest ochre, broader, acute, reflexed; lip shouldered at base, nearly square and narrow, suddenly enlarged, the disk marked with a blotch and four lines of brown; column light green, with some mauve lines; inflorescence one-flowered. Siam, 1884.

D. Smilliæ. *fl.* purplish-rose, small, produced in dense racemes 2in. to 3in. long from the uppermost nodes. *l.* 2in. to 4in. long. Stems 1ft. to 2ft. long, thick. Queensland, 1888. More interesting than beautiful. (F. A. O. i., pt. vii., t. 2.)

D. speciosissimum (very showy).* *fl.*, pure white, about 2½in. across, with a deep orange-red blotch on the lip, resembling those of *D. formosum* (to which this species bears great resemblance). Stems 5ft. to 6ft. high, slender. Borneo, 1895.

D. speciosum Bancroftianum (Bancroft's). *fl.*, sepals and petals white; petals longer and narrower than in the type; lip paler, with a few purple spots at base. Stems slenderer.

D. spectabile (remarkable). *fl.* large, singularly formed, produced in upright spikes; sepals and petals pale yellow with irregular stripes of purple, the former triangular, extended into a wavy tail, the latter narrower; lip white with purple veins, the side lobes erect, hood-like, the front one elongated. New Guinea. (G. C. Dec. 30, 1899, p. 491, f. 162.)

D. Stratiotes (soldier).* *fl.* of a good size, very peculiar; sepals ivory-white, lanceolate, acuminate, rolled back; petals pale green, longer than the sepals, narrow-linear, twisted, quite erect; lip cream-coloured, veined violet, three-lobed, the front lobe ovate, acute; racemes numerous. *l.* rather short, oblong. Pseudo-bulbs long, fusiform. Sunda Islands, 1836. A remarkable and handsome species. (G. C. n. s., xxvi., p. 177; I. H. 602; L., t. 43.)

D. strebloceras (twisted-horned). *fl.*, sepals green, nerved brown on the inner side at base, ligulate, acute, twisted, undulated; petals dark cinnamon-brown, margined green, longer, linear, acute, twisted four times; lip green, brown, white, and mauve-purple, the side laciniæ oblique, oblong, truncate; column

Dendrobium—*continued.*

white, minutely spotted brown; inflorescence eight-flowered. Sunda Islands, 1887.

D. s. Rossianum (Ross'). *fl.* white; petals tinged with green; lip and sepals at length yellowish. 1888.

D. suavissimum is a variety of *D. chrysotoxum.*

D. subclausum (nearly closed). *fl.* of a brilliant orange-colour, ⅔in. long; racemes short, few-flowered. *l.* oblong, about 1in. long. Stems slender, 1½ft. long. Moluccas, 1894. A curious species.

D. sulcatum polyanthum (many-flowered). *fl.* buff-yellow, the lip orange, with two crimson blotches; racemes sub-globose, about fourteen-flowered; peduncle erect from an upper axil, then arching over. *l.* ovate-oblong, acute or shortly acuminate, seven-nerved, sub-cordate at base, 3in. to 4½in. long. 1887. This is merely the properly developed condition of the species, Lindley's original description having been based on a poor specimen.

D. Sumneri (Sumner's). *fl.* pink, few, distant; sepals and petals ½in. long; lip shorter, the claw much dilated from the base and expanded into broadly ovate lateral lobes; raceme (with peduncle) about 8in. long. *l.* 3in. to 4in. long. Stems 1½ft. to 2ft. long. Australia.

D. superbum Burkei (Burke's).* *fl.* white, with two light blush-rose cheeks on the base of the disk of the yellowish-white lip. 1884. A fine variety.

D. tetragonum (quadrangular). *fl.* 3in. to 4in. across; sepals yellow, spotted red, the dorsal one narrow-subulate, the lateral ones lanceolate, much broader at the base than the dorsal one; petals white, streaked red, linear, shorter and narrower than the sepals; lip white, transversely barred red, broadly ovate, apiculate, obscurely three-lobed, with two white lamellæ between the side lobes; raceme few-flowered. *l.* in pairs at the summit of the stem, spreading, oblong or elliptic-lanceolate. Stems pendulous, acutely four-angled, 8in. to 15in. or more in length, attenuated to a slender footstalk which is pseudo-bulbous at base. Australia, 1838. (B. M. 5956.)

D. thyrsiflorum (thyrse-flowered). The correct name of the plant described on p. 453, Vol. I., as *D. densiflorum albo-luteum.*

D. t. Walkerianum (Walker's). *fl.* larger, racemes stronger, and stems longer, than in the type. (W. S. O. iii. 21.)

D. transparens album (white). *fl.* wholly white. 1888.

D. Treacherianum (Treacher's). *fl.* pale rose-red, two or three to a scape, sub-erect, upwards of 1½in. long; sepals narrow-lanceolate, the dorsal one straight, the lateral ones connate in a gibbosity or spur striped with red; petals like the dorsal sepal; lip darker red and shorter than the petals, three-lobed. July. *l.* in pairs, 3in. to 4in. long, ½in. to ⅔in. broad, linear-oblong. Pseudo-bulbs brownish-green, stained red. Borneo, 1880. (B. M. 6591; W. O. A. vi. 288.)

D. trigonopus (triangular-columned). *fl.* golden-yellow; sepals ligulate, acuminate, keeled on the middle; petals broader and shorter; claw of the lip rather long, dilated into a broad lamina whose lateral segments are nearly square; column triangular-pandurate. *l.* thick, papery, dull green, rather rough, slightly hirsute at back. Birma, 1887.

D. undulatum (wavy). *fl.*, sepals and petals dingy brown, usually bordered with yellow, very similar, about 1in. long; lip shorter than the sepals, the lateral lobes large, the middle one small; racemes springing from the upper part of the stem, often above 1ft. long. *l.* bifarious, 3in. to 4in. long, somewhat undulated. Australia, 1838. A stout species, forming large tufts. SYN. *D. discolor* (B. R. 1841, t. 52).

D. Veitchianum (Veitch's). A synonym of *D. macrophyllum.*

D. velutinum (velvety). *fl.* deep yellow, closely resembling those of *D. cariniferum*; lip velvety; raceme 1in. long. *l.* lanceolate, 3in. long. Pseudo-bulbs fusiform, 5in. long. Birma, 1895.

D. veratrifolium (Veratrum-leaved). *fl.* silvery-white, many in a terminal, elongated raceme 1½ft. long, more compact than in *D. Mirbelianum* (to which this species is allied); petals spathulate, 1in. or more in length. *l.* oblong, amplexicaul. New Guinea. SYN. *D. Augustæ Victoriæ.*

D. versicolor (various-coloured). *fl.* at first greenish-yellow, afterwards changing to a good yellow, tinged with purple on the outside; petals at first pale green, afterwards sulphur-yellow; lips passing from greenish to a very pale yellow. Assam, 1895.

D. vexabile (vexing). *fl.* light sulphur-ochre, partly white; side laciniæ of the lip marked with numerous narrow lines, the anterior lacinia sulphur, with an orange blotch on each side of the tuft of hairs, very wavy. 1878. Allied to *D. Ruckeri.*

D. Victoriæ Reginæ (Queen Victoria's).* *fl.* produced in great numbers from the branching stems; sepals white, blotched with blue; lip blue, oblong. Philippine Islands, 1897. (G. C. 1897, xxii., p. 121, f. 34.)

D. virgineum (maiden). This resembles *D. infundibulum*, but the flowers are smaller, ivory-white, with two thickened, ligulate, reddish lines running from the base to the middle of the lip. Birma, 1885.

D. Wallichianum (Wallich's). A variety of *D. nobile.*

D. Wardianum. The correct name is *D. pendulum.*

D. Wattii (Watt's). The correct name of *D. cariniferum Wattii.*

D. Williamsianum (Williams').* *fl.* large; sepals ivory-white, the dorsal one and the ivory-white petals broadly oblong, apiculate, the lateral sepals triangular, the disk of the petals washed light purple; lip purple, having an angular chin, standing upright, adpressed to the column, the limb roundish; racemes about twelve-flowered, produced from the upper part of the slender bulbs. New Guinea, 1886. (G. C. n. s., xxvi., p. 173; W. O. A. 252.)

Other species in cultivation at Kew and elsewhere, but not of general horticultural interest, are: *D. eulophotum, D. Fitzalani, D. hainanense, D. herbaceum* (syn. *D. ramosissimum*), *D. linguiforme* (B. M. 5249), *D. lonchophyllum, D. monophyllum* (F. A. O. i., pt. vi., t. 9), *D. Mooreanum, D. Mortii, D. O'Brienianum, D. panduratum, D. parcum* (R. X. O., t. 169), *D. quadrilobum, D. signatum, D. strongylanthum, D. stuposum,* and *D. terminale.*

From the first, the nomenclature of hybrid Dendrobiums has been in a state of confusion, owing to distinctive names having been given to plants derived from the same parentage. We, therefore, give a list of names with parentage as recorded.

Adrasta	*Pierardi* and *superbum* (Veitch).
Æneas	*japonicum* and *crystallinum* (Veitch).
Ainsworthii	*aureum* and *nobile* (Ainsworth).
Ainsworthii Cyphers var.	*aureum* and *nobile elegans* (Cypher).
Ainsworthii intertextum	*aureum Lees* var. and *nobile* (Veitch).
Alcippe	*lituiflorum Freemani* and *Wardianum* (Veitch).
Andromeda	*Leechianum* and *japonicum.*
Apollo grandiflorum	*nobile pulcherrimum* and *splendidissimum grandiflorum* (Cypher).
Armstrongi	*aureum* and *nobile cærulescens* (Winn).
Aspasia	*aureum* and *Wardianum* (Veitch).
Astræa	*luteolum* and *crassinode* (Cookson).
Aurora	*Findlayanum* and *nobile* (Lawrence).
Backhousei	*nobile* and *thyrsiflorum* (Backhouse).
Benita	*aureum* and *Falconeri* (Brymer).
Berkeleyi	*Cassiope* and *Wardianum* (Berkeley).
Bryan	*luteolum* and *Wardianum* (Cookson).
Burberryanum	*Findlayanum* and *Dominianum* (Chamberlain).
burfordiense	*Linawianum* and *aureum* (Lawrence).
Cassiope	*japonicum* and *nobile albiflorum* (Cookson).
cheltenhamense	*luteolum* and *aureum* (Cypher).
chlorostele	*Linawianum* and *Wardianum* (Lawrence).
chrysodiscus	*Findlayanum* and *Ainsworthii* (Lawrence)
Clio	*splendidissimum grandiflorum* and *Wardianum* (Lawrence).
Clytie	*Findlayanum* and *Leechianum* (Chamberlain).
Cordelia	*aureum* and *euosmum leucopterum* (Veitch).
Cordelia flavescens	*aureum* and *uosmum leucopterum* (Veitch)
Corningianum	*nobile* and *lituiflorum* (Corning).
crepidato-nobile	*nobile* and *crepidatum* (Veitch).
Curtisii	*Cassiope* and *aureum* (Sander).
Cybele	*Findlayanum* and *nobile* (Veitch).
Cybele nobilius	*Findlayanum* and *nobile nobilius* (Veitch).
dellense	*nobile Schröderianum* and *splendidissimum* (Schröder).
Dido	*Findlayanum* and *Ainsworthii* (Lawrence).
Dominianum	*Linawianum* and *nobile* (Veitch).
Doris	*Leechianum* and *japonicum* (Veitch and Cookson).
dulce	*aureum* and *Linawianum* (Cookson).
Edithiæ	*nobile nobilius* and *aureum* (Lee).
endocharis	*japonicum* and *aureum* (Veitch).
Ethel	*japonicum* and *Rolfeæ roseum* (Cypher).
euosmum	*andocharis* and *nobile* (Veitch).
euosmum virginale	*endocharis* and *nobile intermedium* (Veitch).
Euryalus	*Ainsworthii* and *nobile* (Veitch).
Euryclea	*lituiflorum* and *Wardianum* (Veitch).
Euterpe	*nobile* and *Wardianum* (Lawrence).
Farmerii-thyrsiflorum	*Farmerii* and *thyrsiflorum* (Sander).
Findlayana - Wardianum	*Findlayanum* and *Wardianum* (Ashworth).
formoso-Lowii	*formosum* and *Lowii* (Lawrence).
Galatea	*japonicum* and *Rolfeæ roseum* (Thwaites).

Dendrobium—*continued.*

Gemma	*superbum Hattonii* and *aureum* (Winn).
Harold	*Findlayanum* and *Linawianum* (Cookson).
Hebe	*Findlayanum* and *Ainsworthii* (Lawrence).
hesseliense	*Findlayanum* and *splendidissimum grandiflorum* (Burkenshaw).
Holmesianum	*Dominianum* and *Schneiderianum* (Hardy).
illustre	*chrysotoxum* and *Dalhousieanum* (Veitch).
Juno	*Linawianum* and *Wardianum* (Lawrence).
Kenneth	*Bensoniæ* and *McCarthiæ* (Cookson).
Kingiano-speciosum	*Kingianum* and *speciosum* (Lawrence).
Leechianum	*aureum* and *nobile* (Swan).
Luna	*Findlayanum* and *Ainsworthii* (Lawrence).
Lutwycheanum	*Wardianum* and *splendidissimum grandiflora* (Lutwych).
melanodiscus	*Findlayanum* and *Ainsworthii* (Lawrence).
Melpomene	*splendidissimum* and *signatum* (Lawrence).
Mentor	*primulinum* and *superbum* (Veitch).
micans	*lituiflorum Freemanii* and *Wardianum* (Veitch).
Murrayi	*nobile* and *albo-sanguineum* (Cookson).
Nestor	*Parishii* and *superbum anosmum* (Winn).
Niobe	*tortile* and *nobile* (Veitch).
Owenianum	*Linawianum* and *Wardianum* (Sander).
pallens	*Findlayanum* and *Ainsworthii* (Lawrence).
porphyrogastrum	*Dalhousieanum* and *superbum Hattonii* (Veitch).
Rainbow	*Findlayanum* and *Ainsworthii* (Lawrence).
rhodostoma	*superbum Hattonii* and *sanguinolentum* (Veitch).
Rœblingianum	*Ruckerii* and *nobile* (Pitcher).
rubens	*Leechianum* and *nobile nobilius* (Cypher).
rubens grandiflora	*splendidissimum grandiflorum* and *nobile nobilius* (Cypher).
Sanderæ	*nobile albiflorum* and *aureum* (Sander).
Schneiderianum	*Findlayanum* and *aureum* (Hardy).
Sibyl	*bigibbum* and *Linawianum* (Cookson).
specio-Kingianum	*Kingianum* and *speciosum* (Lawrence).
splendidissimum	*aureum* and *nobile* (Veitch).
Statterianum	*Bensoniæ* and *crystallinum* (Statter).
striatum	*japonicum* and *Dalhousieanum* (Veitch).
Thalia	*Ainsworthii* and *nobile nobilius* (Lawrence).
The Gem	*Ainsworthii* and *aureum* (Winn).
Thompsonianum	*nobile Cypherii* and *cheltenhamense* (Thompson).
Vannerianum	*japonicum* and *Falconeri* (Vanner).
Venus	*Falconeri* and *nobile* (Veitch).
Vergile	*nobile* and *Ainsworthii* (Haywood).
Virginia	*japonicum* and *Bensoniæ* (Veitch).
Vulcan	*Juno* and *Wardianum* (Chamberlain).
Wardiano-aureum	*aureum* and *Wardianum* (Veitch).
Wardiano-japonicum	*japonicum* and *Wardianum* (Veitch).
Wiganiæ	*nobile* and *signatum* (Wigan).
xanthocentrum	*Findlayanum* and *nobile* (Lawrence).

The following are natural hybrids:

barbatulo-chlorops	*barbatulum* and *chlorops*.
Boxalli	*crystallinum* and *crassinode*.
crassinodo-Wardianum	*crassinode* and *Wardianum*.
Donnesiæ	*formosum* and *infundibulum*.
Leeanum	*Phalænopsis* and *superbiens*.
melanophthalmum	*Wardianum* and *crassinode*.
Murrhiniacum	*Wardianum* and *nobile*.
Pitcherianum	*primulinum* and *nobile*.
polyphlœbium	*Pierardi* and *Parishii*.
rhodopterygium	*Pierardi* and *Parishii*.
Rolfeæ	*primulinum* and *nobile*.
Wattii	*infundibulum* and *flexuosum*.

DENDROBIUM BEETLE (*Xyleborus perforans*). A destructive insect from the tropics, but flourishing in Orchid-houses, where it is especially partial to *Dendrobium Phalænopsis*. Both Beetle and grub are destructive. The perfect insect (Fig. 338) is rather more than ⅛in. in length and of a chestnut-brown colour. As the specific name suggests, it perforates the stems (Fig. 339), and, once inside, tunnels in various directions, causing the plant

Dendrobium Beetle—*continued.*

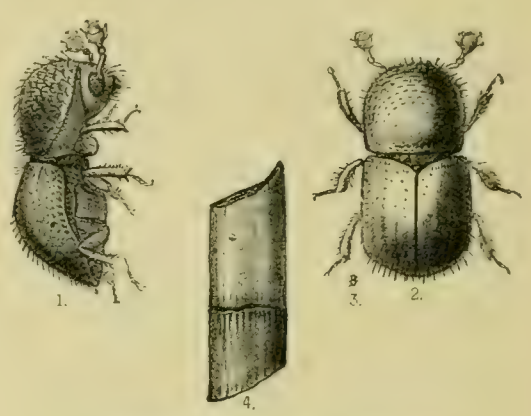

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FIG. 338. DENDROBIUM BEETLE (*Xyleborus perforans*).

1 and 2, Beetle highly magnified; 3, Insect natural size; 4, Infested stem, with hole made by Beetle.

attacked to have an unhealthy look. The grub (Fig. 339) is white and footless. Plants showing signs of decay, and whose stems are found to be perforated in the way shown in the portion of plant illustrated, should have such portions removed and burned. The check received will be nothing to the damage that would ultimately occur were the insects allowed free play. In bad attacks Dendrobiums are sometimes killed. This Beetle does not feed exclusively upon Orchids: in the sugar-growing countries it is destructive to the canes.

FIG. 339. GRUB OF DENDROBIUM BEETLE IN ORCHID STEM.

DENDROCHILUM. Several species formerly included here are now referred to **Platyclinis.**

D. squalens (squalid). A synonym of *Xylobium squalens.*

D. vestitum (clothed). A synonym of *Eria vestita.*

DENDROCOLLA. A synonym of **Sarcochilus** (which *see*).

DENDROLIRIUM. A synonym of **Eria** (which *see*).

DENDROLOGY. The natural history of trees.

DENDROPANAX. Flowers hermaphrodite or rarely polygamous; petals five; stamens five; umbellules solitary or paniculate. Leaves simple, entire or rarely three- to five-cleft. To the species described on p. 458, Vol. I., the following should be added:

D. arboreum (tree-like). *fl.* pale yellow; umbels in terminal, simple corymbs; peduncles 1in. to 2in. long. July. *l.* simple, elliptical, 4in. to 6in. long, repand-undulated or obscurely serrated. *h.* 12ft. to 20ft. West Indies. SYNS. *Aralia arborea, Hedera arborea.*

DENDROPHYLAX (from *dendron*, a tree, and *phulax*, a defender; in allusion to the habit of the plants). ORD. *Orchideæ*. A small genus of stove, epiphytal, leafless Orchids, natives of the West Indies and allied to *Mystacidium*. Flowers solitary or few in a raceme; sepals and petals sub-equal, free, spreading; lip sessile at the base of the column, the base produced into a long spur, the lateral lobes short, the middle one two-lobed; column very short, broad; scapes slender, simple. Roots densely fascicled. Pseudo-bulbs wanting. Two of the species have been introduced. For culture, *see* **Cymbidium.**

D. Fawcettii (Fawcett's). *fl.* 2in. in diameter, several on a scape, varying from 2in. to 23in. long; sepals and petals

Dendrophylax—*continued.*

greenish-white, lanceolate, acute; lip white, with a slender spur 7in. long. Roots long, green. 1883. Closely allied to *D. funalis.*

D. funalis (rope-like). *fl.* greenish-white, ¼in. long; lip ⅜in. broad, about half as long as the subulate-filiform, straight-descending spur; scapes distantly sheathed, few-flowered, 1in. to 4in. long. Roots often several feet long. 1846. SYN. *Angræcum funale* (B. M. 4295).

DENDROSERIS. SYN. *Rea.* Flower-heads usually white, mediocre or large, produced at the tips of the branches of an ample panicle. Leaves alternate, petiolate or the upper ones sessile, often large, entire, lobed, or once or twice pinnate, glabrous.

DENDROSPARTUM. Included under **Genista** (which *see*).

DENITRIFICATION. This is a soil condition resulting from the removal of nitrogen. Whenever the soil is in a condition unfavourable to nitrification, there is danger that not only may nitrates not be formed, but that there will be a loss of nitrogen from those nitrates which are present. This loss is due to a process known as Denitrification—a process which is also dependent on micro-organisms. The Denitrification organisms flourish under one condition, which is directly opposed to the corresponding condition favouring nitrification—namely, the absence of oxygen. Under that condition the nitrates may be reduced or changed back to nitrites, and the nitrites are often further reduced till they lose their nitrogen altogether by having it pass off into the air as gaseous nitrogen.

Denitrification may take place, therefore, in waterlogged soils, in badly-drained pot-cultures, and in the inner parts of manure or compost heaps, when air is measurably excluded. An organic manure, therefore, which is effective for plant growth when applied in small quantity, may thus become injurious when made use of in excess. The supply of atmospheric oxygen to a soil is effectually prevented if the soil is kept in a saturated condition with stagnant water. This condition alone is sufficient to set up an energetic Denitrification, by which process the growing plants must considerably suffer. Professor Bréal furnishes a further excellent example of the active Denitrification which takes places in a soil kept saturated with water. He placed some garden soil in a percolator, and consolidated it by pressure; the column was about 15in. high. Water more than sufficient for saturation was then poured upon the soil; when the water had run through it was poured back again over the soil, and this treatment was continued for some time. The soil at the commencement of the experiment was in an active state of nitrification, and the drainage-water was at first rich in nitrates; but at the end of three weeks the nitrates had entirely disappeared from the drainage-water, though no water had been removed from the soil.

DENNSTÆDTIA. Included under **Dicksonia** (which *see*).

DENTARIA. Bentham and Hooker include this genus under **Cardamine** (which *see*). One or two hybrids have been raised by crossing *D. digitata*, *D. pinnata*, and *D. polyphylla*. The following may be described:

D. Killisii (Killis's). A handsome hybrid between *D. digitata* and *D. polyphylla*; it is more robust than either of the parents. Alps, 1889.

D. pinnato-digitata (hybrid). *fl.* like those of *D. digitata*. *l.* pinnate. Jura Mountains, 1889. An interesting hybrid, intermediate in character between the two parents indicated in the name.

DENTIDIA. A synonym of **Perilla** (which *see*).

DEPARIA. The soil most suitable to Deparias, which are not very strong growers, is a compost of an open nature, formed of about equal parts fibrous peat, leaf-mould, and silver-sand. Special attention should be given to the drainage: deficiency in this respect is the principal cause of failure in the cultivation of these plants, which at all times require a liberal supply of water at the roots, but dislike syringing overhead. The Deparias should also be carefully protected against the direct rays of the sun. They are usually propagated by division of the crowns in March and April, their spores being seldom known to germinate.

D. Moorei. This species, which is probably the prettiest of the genus, was formerly known as *Cionidium Moorei* and *Trichocarpa Moorei*. A barren frond is well shown in Fig. 340.

DEPRESSED. Oblate; somewhat flattened vertically or endwise.

DERMATOBOTRYS (from *derma*, *dermatos*, skin or bark, and *botrys*, a cluster; in allusion to the position and disposition of the flowers.). ORD. *Scrophularineæ.* A monotypic genus. The species is a small, epiphytic, deciduous shrub, with a long, naked stem as thick as the wrist, and brown, sub-quadrangular branches. It requires greenhouse treatment.

D. Saundersii (Saunders's). *fl.* 2in. long, drooping in whorls below the new leaves; calyx small, five-parted; corolla pale red, tubular, gradually dilated from a slender base, the five short, spreading lobes yellow within; anthers five. Winter. *l.* 2in. to 6in. long, rather fleshy, ovate or oblong, sub-acute, coarsely toothed. Natal and Zululand, 1892. (B. M. 7369.)

DERMATOPHORA NECATRIX. *See* **Vine Fungi.**

DESCENDING. Directed downward.

DESCHAMPSIA (named in honour of M. Deschamps, of Saint Omer, one of the naturalists selected for the expedition in search of the unfortunate Lapeyrouse). SYN. *Campelia* (of Link). ORD. *Gramineæ.* A genus including about a score species of mostly hardy, perennial Grasses, broadly distributed over temperate and frigid regions, and on mountains within the tropics. Spikelets paniculate, often larger than in *Aira*; glumes two, the lower one empty; panicle terminal, sometimes narrow and dense, often lax. Leaves narrow, convolute-terete or flat. Two species call for mention here. They thrive in any ordinary soil, in moist, shady places, and may be propagated by seeds.

D. cæspitosa (tufted). *fl.* silvery-grey or purplish; panicle very elegant, usually viviparous, 6in. to 12in. long, with spreading, slender, almost capillary branches. Summer. *l.* rather stiff, flat, very rough on the upper surface. Britain. A handsome, tall Grass, forming large, dense tufts.

D. flexuosa (waved). The correct name of *Aira flexuosa.*

DESFONTAINEA. *Linkia* (of Persoon) is synonymous with this genus.

FIG. 340. BARREN FROND OF DEPARIA MOOREI.

DESIGNS. *See* **Bedding-out, Bedding Plants, Garden,** and **Landscape Gardening.**

DESMIDORCHIS. A synonym of **Boucerosia** (which *see*).

DESMODIUM. To the species described on pp. 459-60, Vol. I., the following should be added :

D. japonicum (Japanese). A synonym of *D. podocarpum.*

D. umbellatum (umbelled). *fl.* red, ⅜in. to ½in. long ; umbels six- to twelve-flowered ; pedicels short. July. *l.*, leaflets obtuse, sometimes grey-canescent beneath ; terminal one larger than the lateral ones, 2in. to 3in. long, roundish or broadly oblong ; petioles 1in. or less in length. Young branches densely downy. *h.* 5ft. to 6ft. India, &c., 1801. Stove shrub. SYNS. *Hedysarum arboreum, H. umbellatum.*

DESMONCUS. About twenty-five species, all natives of tropical America, and closely allied to *Bactris*, are included hereunder. To those described on p. 460, Vol. I., the following should be added :

D. mitis (flexible). *fl.*, spadices slender, included ; spathe unarmed ; peduncle 16in. long. November and December. *fr.* red. *l.* about 2ft. long, loosely distichous, long-sheathing ; segments seven to eleven pairs, lanceolate, acuminate, opposite or alternate, about 5in. long, 1¼in. broad. Caudex 3ft. to 5ft. high, flexuous, unarmed. Brazil.

D. orthacanthos (straight-spined). *fl.*, spadix nearly 1ft. long, long-pedunculate ; lower spathe long, smooth ; upper one armed with straight, black prickles. *l.* long-sheathing ; segments elliptic-lanceolate, 6in. long, 1¼in. broad, unarmed or at length having scattered prickles. Caudex climbing, and, as well as the leaf-sheaths, very prickly. Brazil.

D. polyacanthos (many-spined). *fl.*, spadix 12in. to 16in. long ; spathe double, the inner one densely prickly. *l.* remote, 3ft. to 4ft. long, very long-sheathing, tubercled or prickly near the petioles ; segments seven to fifteen pairs, broadly lanceolate, acuminate, mostly 6in. long. Caudex climbing. Brazil.

DESMOTRICHUM. A synonym of **Dendrobium** (which *see*).

DESVAUXIACEÆ. Included under **Centrolepideæ** (which *see*).

FIG. 341. FLOWERING BRANCH OF DEUTZIA CRENATA FLORE-PLENO.

DEUTZIA. Seven species are included in this genus ; they extend from the Himalayas to North China and Japan, while one is found in Mexico. For forcing, the best kinds are *D. crenata flore-pleno* (Fig. 341), *D. gracilis*, and *D. Lemoinei*. Deutzias may be propagated by cuttings of young shoots inserted in sandy soil under a bell-glass in summer.

In order to produce good annual displays of blossom, a rational system of pruning must be adopted. The best time

Deutzia—*continued.*

to prune Deutzias is just after the flowering period is over. The old, worn-out, weak and sickly growths should be removed to make way for younger and better flowering shoots.

Propagation is effected by seeds and cuttings. Seed should be sown in spring in shallow pans of light soil, and placed in a warm greenhouse. When the seedlings have grown about ½in. or so they should be pricked off into a compost of rough loam and good leaf-soil, and kept moist at the roots and overhead, as insect-pests are somewhat troublesome if the plants are allowed to get too dry. In the following spring the plants will be large enough for putting out in nursery-rows. Cuttings 8in. in length strike root if planted on a shady border in the autumn ; or half-ripened shoots may be dibbled in sandy soil in summer, and plunged in a brisk heat in a close propagating-case.

To those described on p. 460, Vol. I., the following should be added :

D. candidissima (whitest). *fl.* snowy-white, about ½in. across, with a funnel-shaped calyx ; panicles erect, many-flowered, hairy. *l.* broadly lanceolate, somewhat fleshy, finely serrated, studded with minute, stellate scales. Habitat not recorded, 1882. (G. C. 1882, xviii., p. 173, f. 30.)

D. c. flore-pleno (double-flowered). *fl.* pure white, double, produced in short racemes.

D. canescens (hoary). *fl.* whitish, disposed in terminal panicles. June and July. *l.* ovate-lanceolate, cuspidate, slightly glandular-toothed, rough above, whitish-pubescent beneath. Branches slender. Japan, 1837.

D. corymbiflora (corymbose-flowered). *fl.* white, small, in erect panicles. *l.* ovate-lanceolate, acute, deep green, tomentose, somewhat rough. Branches slender, with yellowish-grey bark. Western China, 1897. (R. H. 1897, pp. 466-7, f. 139-40.)

D. discolor purpurascens (versicoloured, purplish). *fl.* tinted with rosy-purple, small but numerous, in axillary racemes 2in. long. May. *l.* ovate, finely toothed, ¾in. to 1¼in. long. *h.* 3ft. Yunnan, 1894. (R. H. 1895, p. 65.)

D. gracilis foliis-aureis (golden-leaved). A variety distinguished from the type in having golden leaves. 1839.

D. Lemoinei (Lemoine's). *fl.* white, very large, much more numerous and decorative than in *D. gracilis*, disposed in small, axillary racemes. A hybrid between *D. gracilis* and *D. parviflora.* (G. C. 1895, ii., p. 360, f. 67.)

D. parviflora (small-flowered). *fl.* white. China. Hardy.

DEVIL'S HERB. *See* **Plumbago scandens.**

DEVONSHIRING. An operation now known as paring and burning. Fortunately it is seldom adopted in the garden, as the practice of burning the surface soil is done at the expense of many valuable ingredients, the soil being poorer after such a process than before.

DEYEUXIA (named in honour of Nicholas Deyeux, 1753-1837, a French chemist). SYN. *Lachnagrostis.* ORD. *Gramineæ.* A genus embracing nearly 120 species of greenhouse or hardy, mostly perennial Grasses, broadly dispersed over the temperate and mountainous regions of the globe. Spikelets one-flowered, variously paniculate ; glumes three, the two inferior ones empty ; stamens three ; panicles terminal. Leaves usually flat. *D. elegans variegata* is the only plant of the genus yet introduced which is deserving of mention here ; it thrives under ordinary greenhouse treatment. The genus is represented in the British Flora by *D. neglecta*, a rare species.

D. elegans variegata (elegant, variegated). *l.* numerous, linear, 1ft. to 1½ft. long, of a deep, bright green, bordered with creamy-yellow. Rootstock thick. New South Wales, 1884. An elegant foliage plant.

DIACALPE FŒNICULACEUM. A synonym of **Aspidium fœniculaceum** (which *see*).

DIACRIUM (from *dia*, through, and *akris*, a point ; in allusion to the sheaths on the stalk). ORD. *Orchideæ.* Of this genus four species have been described : they are stove, epiphytal Orchids, natives of Mexico, Central America, and Guiana. Flowers showy, loosely racemose, shortly pedicellate ; sepals sub-equal, free, spreading, rather thick, petaloid ; petals somewhat similar ; lip spreading from the base of the column, nearly equalling the sepals, the lateral lobes spreading or reflexed, the disk elevated between the lateral lobes, two-horned above ; column short and broad, slightly incurved ; pollen masses four ; peduncle terminal, simple, with paleaceous sheaths. Leaves few, articulated with the short sheaths. Stem fleshy, scarcely thickened into an

Diacrium—*continued.*

elongated pseudo-bulb. Only one species calls for mention. For its successful cultivation, it requires a light situation in a very moist stove.

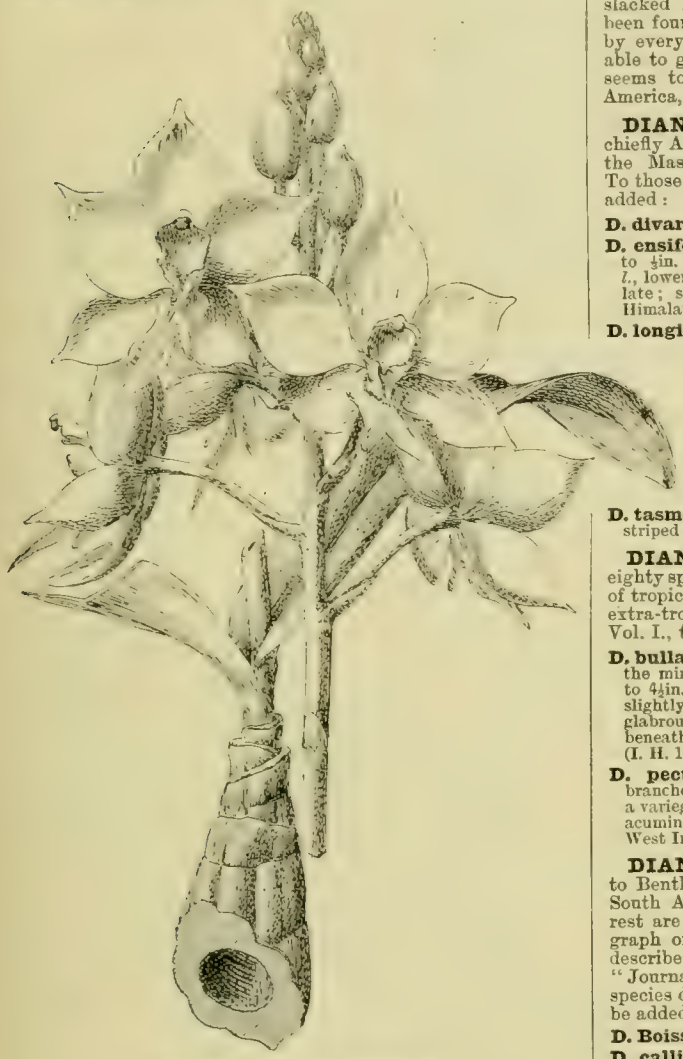


FIG. 342. DIACRIUM BICORNUTUM.

D. bicornutum (two-horned). The correct name of the plant described on p. 512, Vol. I., as *Epidendrum bicornutum*. See Fig. 342.

DIADENIUM (from *dis*, twice, and *aden*, a gland; in allusion to the two glands at the base of the column). SYN. *Chænanthe*. ORD. *Orchideæ*. A genus embracing only two closely-allied species of stove, epiphytal Orchids, with small flowers, natives of Peru and Para, and closely allied to *Comparettia*. *D. Barkeri* (SYN. *Chænanthe Barkeri*) has been introduced, but is probably not now in cultivation.

DIAMOND-BACK MOTH (*Plutella cruciferarum*). The larvæ of this Moth, which has an extremely wide geographical range, are very abundant some seasons, when they cause much damage to Cruciferous crops, but especially to Turnips and Cabbages. Dry weather is favourable to its increase; while wet, showery weather has an opposite tendency. The Moth measures about ½in. in wing expanse, and is in evidence in April, and again in August and September. The fore-wings are greyish-brown, spotted

Diamond-back Moth—*continued.*

with dark brown, with a whitish ochreous inner margin. The hind wings are grey. The larva is green, and may be found in June, July, September, and October. Newly-slacked lime dusted upon the leaves in the morning has been found beneficial; but the cultivator should endeavour by every means to so stimulate his plants that they are able to grow away. A peculiarity of this Moth is that it seems to flourish equally well in Europe, Asia, Africa, America, and Australasia.

DIANELLA. The dozen species of this genus are chiefly Australian, but some of them extend to tropical Asia, the Mascarene and Pacific Islands, and New Zealand. To those described on p. 46, Vol. I., the following should be added:

D. divaricata (divaricate). A synonym of *D. revoluta*.

D. ensifolia (sword-leaved). *fl.* white, greenish, or bluish, ¼in. to ⅓in. long; panicle 1ft. to 2ft. long, cuneiform. August. *l.*, lower ones 1ft. to 2ft. long, ⅜in. to 1½in. broad, linear-lanceolate; sheaths long. Stem 3ft. to 6ft. high, rigid. Tropical Himalayas, 1731. (B. M. 1404.)

D. longifolia (long-leaved). A synonym of *D. revoluta*.

D. revoluta (revolute). *fl.* of a deeper blue than in *D. cærulea*, about ⅓in. long; panicle also looser and more spreading. August. *l.* distichous and crowded at the base of the stem, as in *D. tasmanica*, the sheaths with prominent keels, the two or three outer ones with scarcely any or very short laminæ, the inner ones with narrow, rigid blades 2ft. to 3ft. long, the margins closely revolute. Australia, 1823. SYNS. *D. divaricata*, *D. longifolia* (B. R. 734).

D. tasmanica variegata (variegated). A variety having leaves striped with yellow. 1894.

DIANTHERA. SYN. *Beloperone* (in part). Of the eighty species included in this genus, two or three are natives of tropical Africa or Asia, and the rest are all tropical or extra-tropical American. To those described on p. 461, Vol. I., the following should be added:

D. bullata (studded). *fl.* whitish, small, fascicled in the axils of the minute, opposite bracts. *l.* opposite, shortly petiolate, 3½in. to 4½in. long, 2½in. to 2¾in. broad, elliptic, obtusely acuminate, slightly contracted at base, cordate, bullate between the veins, glabrous, dark green above, purple and pubescent on the veins beneath. Stem terete, fuscous-purple. Borneo, 1886. Stove. (I. H. 1886, 589.)

D. pectoralis (pectoral). Garden Balsam. *fl.* distant, in branched, elongated spikes, mostly one-sided; corolla rosy with a variegated throat, or pale blue, ⅓in. long. May. *l.* lanceolate, acuminate, or oblong-lanceolate, 1in. to 4in. long. *h.* 1ft. to 3ft. West Indies, 1787. SYN. *Justicia pectoralis*.

DIANTHUS. Of the seventy true species (according to Bentham and Hooker) of this genus ten are found in South Africa, one in Siberia and North America, and the rest are European or North African. An exhaustive monograph of *Dianthus* by Mr. F. N. Williams (in which he describes as many as 238 species!) is published in the "Journal of the Linnean Society," vol. xxix. (1893). To the species described on pp. 461-4, Vol. I., the following should be added:

D. Boissieri (Boissier's). A form of *D. sylvestris*.

D. callizonus (beautiful-zoned).* *fl.* pink with a purple, white-dotted zone on the lower part of the crenate petals, about 1½in. across, solitary, shortly pedunculate. June. *l.* spreading, glaucous, linear or linear-lanceolate, acute or obtuse, keeled. Stems numerous, leafy nearly to the apex. Transylvania, 1889. Rockery. (B. M. 7223.)

D. cinnabarinus (cinnabar-red).* *fl.*, petals fiery-red above, paler beneath, covered with sessile glands; stamens not exserted. Summer. *l.* narrow-linear, with very acute, rigid tips. Thessaly, 1883. A fine species, suffrutescent at the base.

D. cruentus latifolius (broad-leaved). A synonym of *D. latifolius*.

D. diutinus (durable). *fl.* pinkish-carmine, six to eight in a head. *l.* glaucous, 3in. long, linear, carinate, spreading. Stems simple, tetragonal. *h.* 6in. Transylvanian Alps and the Banat. Plant glabrous. A very rare rockery species.

D. Fontanesii (Fontanes'). A synonym of *D. spinosus*.

D. Freynii (Freyn's). A variety of *D. glacialis*.

D. Gardnerianus (Gardner's). A variety of *D. chinensis*.

D. glacialis Freynii (Freyn's). *fl.* purple, ⅔in. in diameter. *l.* glaucous. Bosnia, 1892.

D. gracilis (slender). *fl.* light rose-coloured, very pale beneath, sweetly scented, two or three on a short peduncle; petals obovate-cuneate. *l.* 2½in. long, linear, acute, flat, spreading. Mount

Dianthus—*continued.*

Athos and the Balkans. Requires a sunny position on the rockery.

D. graniticus (granite-loving). *fl.* red or purple, solitary or twin, small. *l.* linear, acute, three-nerved. Stems 6in. long, slender, quadrangular. South-west France. A very dwarf species, scabrous below, glabrous above, found in the fissures of rocks and sandy ledges of granitic formation, in the Olive region.

D. microlepis (small-scaled). *fl.* carmine-red or in some forms white; petals obovate-oblong. *l.* §in. long, linear, obtuse, channelled, one-nerved. Mountains of Thrace. Plant tufted, dwarf, glabrous. A very distinct alpine—described as a sort of *D. glacialis* in miniature.

D. pinifolius (Pine-leaved). *fl.* lilac or pale carmine, small, produced in capitate cymes on long stems. *l.* 1½in. long, deep green, aciculate; radical ones recurved; cauline ones one-nerved, appressed. Stems 1½in. to 2in. long. Mountains of Turkey, &c. A curious, tufted, scabrid alpine.

D. semperflorens (ever-flowering). A variety of *D. chinensis.*

D. sinensis. *See* **D. chinensis.**

D. spinosus (spiny). *fl.* white and pink, disposed in small heads. Persian Alps. A bushy little alpine, very densely tufted, and spiny in appearance, although not really so. The correct name is *Acanthophyllum spinosum.* SYN. *D. Fontanesii.*

D. superbus nanus (dwarf). A dwarf variety, growing only 6in. in height, and covered with rosy-purple, deeply-fringed flowers.

D. sylvestris (wood-loving). The correct name of the plant described on p. 464, Vol. I., as *D. virgineus.*

D. s. Boissieri (Boissier's). *fl.* of a pleasing carmine tint, large. Stem 2ft. high. Sierra Morena, Spain. Alpine; requires a sunny position.

DIAPENSIA BARBULATA. A synonym of **Pyxidanthera barbulata** (which *see*).

DIAPHORA MENDICA. *See* **Spilosoma Menthastri.**

DIASIA. A synonym of **Melasphærula** (which *see*).

DIASPINÆ. *See* **Scale Insects.**

DIASPIS. *See* **Scale Insects.**

DIASTELLA. A synonym of **Leucospermum** (which *see*).

DIASTEMA (from *dis*, two, and *stemon*, a stamen; in allusion to the number of stamens). SYN. *Diastemella.* ORD. *Gesneraceæ.* Of this genus fifteen species have been enumerated; they are usually dwarf, stove perennials, with creeping roots or rhizomes, natives of tropical America, from Peru to Mexico. Flowers usually pale violet, purplish, or white, slender, in terminal or axillary racemes; calyx five-lobed; corolla tube cylindrical, the limb spreading, five-lobed; stamens affixed at the base of the tube. Leaves opposite, petiolate, membranous. The species introduced thrive in a compost of peat and loam. Propagation may be effected by cuttings of the young shoots, taken when about 2in. or 3in. long.

D. Lehmanni (Lehmann's). *fl.* white, spotted and lined with violet; corolla lobes ovate; pedicels shorter than the leaves. *l.* stalked, ovate, crenate. Colombia, 1889. Plant resembling *Isoloma pictum*, and clothed with glandular hairs.

D. ochroleucum (yellowish-white). *fl.* yellowish-white; corolla somewhat tumid at base; panicle many-flowered. August. *l.* rather long-petiolate, ovate, acute, deeply serrated, hairy, 3in. to 4in. long, 1½in. to 2in. broad. Stem erect, hairy-pubescent, slightly purplish, 1ft. to 2ft. high. Colombia, 1844. (B. M. 4254.)

D. pictum (painted). A synonym of *Isoloma pictum.*

D. quinquevulnerum (five-spotted). *fl.* ¾in. long; corolla limb white, the throat marked with five rosy-lilac spots; racemes terminal, shorter than the leaves. August. *l.* long-petiolate, ovate or ovate-elliptic, membranous, pilose on both sides, 3in. to 4in. long, 2in. to 2½in. broad. Branches 4in. to 5in. long. Colombia. Plant dwarf. (F. d. S. 832.)

DIASTEMANTHE. A synonym of **Stenotaphrum** (which *see*).

DIASTEMELLA. A synonym of **Diastema** (which *see*).

DIATOMA. A synonym of **Carallia** (which *see*).

DIBRACHION (of Regel). Included under **Homalanthus** (which *see*), the correct name of *D. peltatum* being *H. giganteus.*

DICALYMMA. A synonym of **Podachænium** (which *see*).

DICENTRA. Bleeding Heart. Including *Dactylicapnos.* This genus embraces about a dozen species, natives of North America, Western Asia, and the Himalayas.

DICENTRANTHERA. Included under **Asystasia** (which *see*).

DICEROS (of Persoon). A synonym of **Artanema** (which *see*).

DICHÆA. SYN. *Fernandezia* (of Ruiz and Pavon), in part. About a dozen species are included in this genus. To that described on p. 465, Vol. I., the following should be added:

D. glauca (glaucous). *fl.* whitish, ¼in. long; lip sagittate-reniform, broadly clawed. June. *l.* linear-oblong, 1½in. to 2in. long, bluntly mucronate, glaucous beneath. Jamaica, 1837. SYN. *Epidendrum glaucum.*

D. vaginata (sheathed). *fl.* white, very small. Stems long and flattened, with close-set, distichous, small-sized leaves. Mexico, 1885. A neat plant, suitable for basket culture.

DICHILUS (from *dis*, twice, and *cheilos*, a lip; in allusion to the two-lipped calyx). SYNS. *Calycotome, Melinospermum.* ORD. *Leguminosæ.* A small genus (three species) of slender, erect, greenhouse under-shrubs, natives of South Africa, with yellow, nodding flowers, and digitately trifoliolate leaves. *D. lebeckioides* has been introduced, but is probably no longer grown.

DICHLAMYDEOUS. Furnished with both calyx and corolla.

DICHOPOGON (from *dicha*, double, and *pogon*, a beard; in allusion to the two appendages of the anthers). ORD. *Liliaceæ.* A small genus (two species) of greenhouse, perennial herbs, natives of Australia and Tasmania. Flowers loosely racemose, solitary or fascicled in the scarious bracts; perianth marcescent, persistent, not twisted, the segments distinct, spreading, the inner ones broader; stamens six, hypogynous; pedicels slender, often jointed above the middle; scape often branched, leafless, or furnished with leafy bracts below the inflorescence. Leaves radical, narrow-linear. Rhizome short; root-fibres fascicled, often bearing tubers. *D. strictus*, the only species as yet in cultivation, thrives in a compost of sandy loam and peat, and may be increased by divisions of the rhizome, or by the tubers on the root-fibres.

D. strictus (erect). *fl.* scented like Heliotrope; perianth pale or dark purple, 1½in. or less in diameter, the segments horizontally spreading, the outer ones elliptic-oblong, acute, the inner twice as broad; raceme or panicle 3in. to 8in. long. November. *l.* 1½ft. long, ¼in. broad, concave, Grass-like, sheathing at the very base. Stem longer than the leaves, erect, stout or slender. Tubers ¼in. to ¾in. long, fleshy. 1883. (B. M. 6746.) SYN. *D. undulatus* (R. G. ii., t. 37).

D. undulatus (waved). A synonym of *D. strictus.*

DICHOPSIS (from *dicha*, in two, and *opsis*, resemblance; the lobes of the calyx are in two series, and the anthers two-lobed at the apex). SYN. *Isonandra* (in part). ORD. *Sapotaceæ.* A genus embracing about thirty species of usually large, stove trees with milky juice, natives of Southern India, the Malay Peninsula and Islands, and Samoa. Flowers fascicled, axillary, or on the naked branchlets below a terminal tuft of leaves; calyx lobes six, biseriate; corolla lobes six, imbricated or contorted; stamens twelve to eighteen. Fruit fleshy, one- or two-seeded. Leaves obovate or oblong, petiolate, coriaceous.

D. Gutta, the only species introduced, was formerly known as *Isonandra Gutta*, under which name it is described on p. 202, Vol. II.

DICHORISANDRA. SYN. *Stickmannia.* About twenty-eight species, all tropical American, are included in this genus. To those described on p. 467, Vol. I., the following should be added:

D. acaulis (stemless). *fl.* deep violet-blue. *l.* disposed in a rosette, nearly sessile, glossy, intense green above, marked with a considerable number of short, longitudinal stripes of silvery-white, deeply tinted with violet-purple beneath. Brazil, 1894. Plant almost stemless. (I. H. 1894, t. 19.)

D. angustifolia (narrow-leaved). *l.* lanceolate, acute, 4in. to 6in. long, dark green above, marked with numerous transverse white streaks between the nerves, purple beneath. Ecuador, 1892. (I. H. xxxix., t. 158.)

D. Gaudichaudiana (Gaudichaud's). *fl.* blue and yellow; raceme 1½in. to 2in. long; bracts ovate-lanceolate. August. *l.* obovate-lanceolate, 6in. to 10in. long, 2½in. broad, shortly

INDIAN AND HARDY AZALEAS:

1.—Mademoiselle Marie Planchon. 2.—Empereur de Brazil. 3.—Sinense

Dichorisandra—*continued.*

acuminate, woolly-villous on the margins; petioles ¼in. long. Branches 1ft. to 1½ft. long, simple, pilose. Brazil, 1847. SYN. *D. ovata* (P. M. B. xv., t. 5).

D. gracilis (slender). *fl.* blue; petals obtuse; raceme 1½in. long, pedunculate, pubescent. August. *l.* 6in. long, 1½in. broad, lanceolate, very long-acuminate, cuneate at base, glabrous. Stem slender, almost simple, glabrous. *h.* 1½ft. Brazil.

D. mosaica (mosaic). The correct name of *D. musaica.*

D. m. gigantea (gigantic). *l.* broadly ovate, 9in. long, 5in. broad, very deep green, with lighter-coloured bars. Stems 2ft. high. 1892. A fine variety.

D. ovalifolia (oval-leaved). *fl.* purple; panicle 2½in. long, divaricately branched; bracts 2½in. long. May. *l.* 5in. long, 2½in. broad, sessile, oval, acuminate, glabrous, the upper ones oblong-lanceolate. Branches 1½ft. long. Panama, &c., 1846.

D. ovata (ovate). A synonym of *D. Gaudichaudiana.*

D. pubescens (downy). *fl.* blue; petals elliptic, with a short, sharp point; raceme 1½in. to 4in. long. *l.* 3½in. long, 1½in. broad, lanceolate or oblong-lanceolate, acuminate, slightly petiolate; sheath pilose-pubescent. Rio Janeiro.

D. p. tæniensis. *fl.* blue and white, in short, terminal, spike-like panicles. *l.* lanceolate, acuminate, rich green, striped with white. Brazil, 1888. (G. C. 1888, iii., p. 557, f. 75.) Also called *talmiensis.*

D. undata is synonymous with *D. mosaica* (SYN. *D. musaica*).

DICHOSEMA. Included under **Mirbelia** (which *see*).

DICHROA (from *dis*, two, and *chroa*, a colour; in allusion to the two colours of the flowers). SYNS. *Adamia*, *Cyanitis.* ORD. *Saxifrageæ.* A monotypic genus, consisting of the three forms described on p. 22, Vol. I., under **Adamia**, all of which are now regarded as forms of one species, viz., *D. febrifuga.*

DICHROMA (of Cavanilles). A synonym of **Ourisia** (which *see*).

DICHROSTACHYS. *Cailliea* is synonymous with this genus.

DICHROTRICHIUM. SYN. *Tromsdorffia* (of R. Brown). This genus embraces five species, four of which are found in the Malayan Archipelago and one in Khasya.

DICKSONIA. Including *Patania* and *Leptopleura.* About forty species are here included. The majority of Dicksonias only require cool treatment, most of the arborescent kinds being found growing in valleys and in deep, shaded ravines, and in countries where some of them occasionally have their fronds heavily loaded with snow. *D. antarctica* thrives when planted outside in sheltered spots in different parts of England, Wales, and Ireland.

When grown in pots Dicksonias must have water to their roots all the year round. When not planted out, all Tree-Ferns thrive best in pots or tubs in which only 3in. to 4in. of soil round the trunks are allowed. The best compost is fibrous peat, two parts; fibrous loam, one part; and coarse silver-sand, one part. During summer the trunks of Dicksonias should be thoroughly watered twice a day, decreasing the supply as the season advances, and in winter just keeping them moist. They are usually propagated from spores, but the rhizomatous species may be divided in March or April.

To those described on pp. 467-8, Vol. I., the following should be added:

D. apiifolia (Parsley-leaved).* *fronds* somewhat rigid, bright green, tripinnate; lower pinnæ 1ft. to 1½ft. long, 6in. to 9in. broad; pinnules long and narrow, their lower segments, with sharply-toothed lobes, about 1in. long and ¼in. broad. *sori* two to twelve to a segment, placed at the bottom of the notches of the lobes; involucre cup-shaped, nearly circular. Andes of Ecuador and Peru. A strong-growing, stove species. SYNS. *D. tenera* (of gardens), *Patania apiifolia.*

D. Billardieri (Labillardière's). A synonym of *D. antarctica.* (R. G. 1889, p. 637, f. 90.)

D. Blumei (Blume's). A synonym of *D. chrysotricha.*

D. cicutaria. Among the various forms of this in cultivation are *D. dissecta* (of Sieber), with barren segments more wedge-shaped than in the type, and serrated above; *D. erosa*, with larger, more hairy, and less deeply-lobed pinnules; *D. c. incisa*, with fronds more compound; and *D. tenera* (of Martius), of a more membranous texture.

D. davallioides Youngii (Young's). *fronds* large, minutely sub-divided. See Fig. 343.

Dicksonia—*continued.*

D. Deplanchei (Deplanche's). *fronds* ample, rigid, coriaceous, smooth and uniformly green on both sides. New Caledonia. A stove, arborescent species, of little decorative value.

D. dissecta (of Sieber). A form of *D. cicutaria.*

D. erosa (bitten). A form of *D. cicutaria.*

D. Lathami (Latham's).* *fronds* tripinnate, narrow-oblong, dark green, coriaceous, 14ft. to 15ft. long; pinnæ sessile, oblong-lanceolate, acuminate, 1½ft. to 2ft. long, 6in. to 8in. broad, with close-set, sessile, lanceolate, acute pinnules; pinnulets oblong, obtuse, more or less lobed or crenulate. 1886. A noble, stove, evergreen Tree Fern, supposed to be a hybrid between *D. antarctica* and *D. arborescens.*

D. magnifica (magnificent). A synonym of *D. chrysotricha.*

D. obtusifolia (having obtuse segments). A synonym of *D. adiantoides.*

D. princeps (foremost), of gardens. A synonym of *Cyathea insignis.*

D. scabra (rough). *rhiz.* wide-creeping. *sti.* about 1ft. long, rough and very hairy below. *fronds* triangular or hastate, bipinnate, 20in. to 30in. long, 6in. to 2ft. broad; lower pinnæ hastate, 4in. to 8in. long, their pinnules quite distinct, the lower ones cut down nearly to the stalk into pinnatifid segments, hairy beneath. *sori* two to six to the lower segments; involucre cup-shaped. India, &c. Stove. SYNS. *Patania scabra*, *Sitolobium strigosum* (of gardens).

D. tenera (tender), of Martius. A form of *D. cicutaria.*

D. tenera, of gardens. A synonym of *D. apiifolia.*

D. gracilis and *D. Herberti* are also in cultivation at Kew.

FIG. 343. DICKSONIA DAVALLIOIDES YOUNGII.

DICLINOTRYS. A synonym of **Chamælirium** (which *see*).

DICLIPTERA SCORPIOIDES (of gardens). A synonym of **Jacobinia Mohintli** (which *see*).

DICRYPTA. Included under **Maxillaria** (which *see*). The correct name of *D. Baueri* is *M. crassifolia.*

DICTYOCALYX. A synonym of **Cacabus** (which *see*).

DICTYOCARYUM (from *dictyon*, network, and *karyon*, a nut; in reference to the fragile endocarp). ORD. *Palmæ.* A small genus (about four species) of tall, unarmed, stove Palms, allied to *Iriartea*, natives of Colombia and Brazil. Flowers yellow, arranged as in *Cyphophœnix*; spadices at first cone-like, elongated, afterwards fasciculately branched; spathes six or seven, deciduous. Fruit ovoid or sub-globose; endocarp membranous, fragile. Leaves few, equally pinnatisect; segments obliquely flabellate, cuneate, cut into eight to ten narrow divisions. *D. glaucescens* and *D. Wallisii* are, or have been, in cultivation on the Continent.

DICTYOPSIS. A synonym of **Behnia** (which *see*).

DICTYOPTERYX CONTAMINANA. *See* **Pear-Insects.**

DICTYOSPERMA. About five species, natives of Madagascar and Mauritius, are included in this genus. To those described on p. 470, Vol. I., the following should be added :

D. fibrosum (fibrous). *fr.* sub-globose, ⅜in. in diameter. *l.* pinnate, 5ft. long; leaflets 1½ft. long, 1in. wide; petioles 2ft. long. Trunk slender, about 3ft. high. Madagascar, 1894. This species yields the Piassava fibre of commerce.

DICTYOXEPHIUM. A compost of two parts peat or leaf-mould, one of rich fibrous loam, and one of sand is that which best suits *D. panamense*. It must, at all times of the year, be liberally watered at the roots. Though averse to bright sunlight, the plant requires very little shading. Propagated by division of the crowns.

DIDIERA (commemorative name). ORD. (?). An anomalous genus. *D. mirabilis*, in a young state, and when at rest, has much the appearance of a small species of *Melocactus*. It has been described as "a weird, uncanny thing, having spreading, serpentine branches, thickly covered with spines," growing to a height of several mètres, on dry, rocky soil. Several seedling plants have been raised in Paris, but as at present known they are decidedly more curious than beautiful. (G. C. 1898, i., p. 110, f. 42.)

DIDYMOCARPUS. Including *Henckelia*. According to C. B. Clarke, in Hooker's "Flora of British India," this genus now embraces seventy species, found in India, Malaya, South China, and (one) Madagascar. To those described on p. 471, Vol. I., the following should be added :

D. lacunosa (excavated). *fl.* violet-blue, tubular, 1½in. long, nodding; corolla lobes short, rounded, recurved, entire; inflorescence resembling a Streptocarpus. July. *l.* crowded, petiolate, oblong or ovate-cordate, crenulate, with deep excavations. Penang, 1892. A lovely little plant, almost stemless, and tomentose. (B. M. 7236.)

D. malayana (Malayan). *fl.* nodding or drooping, about 2in. long; corolla tube pale straw-coloured and pubescent outside, slender, terete; limb golden-yellow, 1in. across; scape 2½in. to 3in. high. June. *l.* spreading from the root, crowded in unequal pairs, 2in. to 3in. long, broadly ovate. Penang (?), 1896. Plant densely tufted, softly pubescent. (B. M. 7526; G. C. 1896, xx., p. 123, f. 24.)

D. primulæfolia is a variety of *D. Humboldtiana*.

D. Rexii (Rex's). A synonym of *Streptocarpus Rexii*.

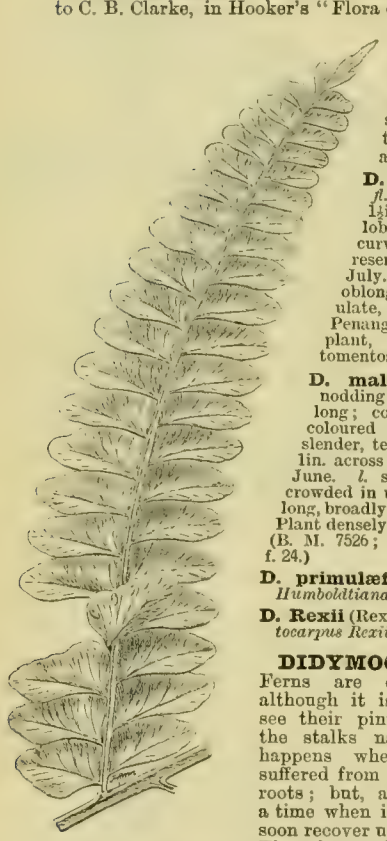


FIG. 344. DIDYMOCHLÆNA LUNULATA.

DIDYMOCHLÆNA. These Ferns are of easy cultivation, although it is nothing unusual to see their pinnules fall off, leaving the stalks naked; that generally happens when the plants have suffered from want of water at the roots; but, although unsightly for a time when in such condition, they soon recover under liberal treatment. The plants should be potted in a mixture of two parts good fibrous peat and one of loam, with a good dash of silver-sand, and be thoroughly drained. Propagated readily from spores, which are freely produced. *D. lunulata* (Fig. 344) is very distinct.

D. sinuosa (wavy). A synonym of *D. lunulata*.

D. truncatula (slightly truncate). A synonym of *D. lunulata*.

DIDYMOGLOSSUM. *See* **Hymenophyllum.**

DIDYMOPANAX (from *didymos*, double, and *Panax*; the genus is closely allied to *Panax*, but has sub-didymous fruit). ORD. *Araliaceæ*. A genus embracing about ten species of stove trees or shrubs, natives of tropical America. Flowers hermaphrodite; calyx margin repandly five-toothed; petals five, valvate; stamens five, the filaments very short; pedicels continuous with the flowers; umbellules paniculate. Leaves often digitate, rarely simple. *D. Houlletii*, the only species known in gardens, is a fine tree, requiring similar culture to that recommended for the stove and greenhouse species of **Panax** (which *see*).

DIDYMOSPERMA. SYN. *Blancoa* (of Blume). The half-dozen species of this genus are all natives of India and the Malayan Archipelago. Leaves terminal, unequally pinnatisect; leaflets few, trapezoid, erose, one-ribbed, with flabellate nerves.

DIEFFENBACHIA. According to Bentham and Hooker, there are only about half-a-dozen distinct species of this genus, all natives of tropical America. Flowers monœcious, on an inappendiculate spadix, the males and females remote; spathe narrow, the cymbiform lamina rather shorter than the elongated, convolute tube.

Suckers thrown up from the base may be taken off and potted in small pots, or the old stems, which, after the leaves have been removed, have a resemblance to cane (hence the name Dumb Cane, from its appearance and painful effects on the organs of speech), may be cut in pieces 1in. or 2in. long, slightly dried, and planted in the propagating-box with bottom-heat to excite the buds into growth. Equal parts good fibrous loam, peat, and leaf-mould, with a liberal sprinkling of sharp silver-sand or clean river-sand, is best. For good-sized plants in large pots the loam and peat should not be broken up too finely, but used somewhat lumpy, with sufficient drainage to allow the liberal waterings required when the plants are in active growth to pass freely through the compost without fear of stagnation. Syringe frequently, and maintain a brisk moist heat, except during the resting period in the winter season, when less root and atmospheric moisture is needed; but the soil about the roots must never be allowed to get quite dry, as the plants are evergreen, retaining their leaves at all seasons.

To the species and garden forms described on pp. 472-5, Vol. I., the following should be added :

D. illustris (remarkable). A variety of *D. latimaculata*.

D. Jenmani (Jenman's). *l.* long and narrow, oblong-lanceolate, pea-green, with oblique, elongated blotches parallel with the primary veins, extending from the centre nearly to the margin, and mingled with smaller blotches over the surface. British Guiana, 1884. (R. G. 1884, 365.)

D. macrophylla (large-leaved). A synonym of *D. costata*.

DIELLIA. *See* **Lindsaya.**

DIERAMA (from *dierama*, a funnel; in allusion to the shape of the perianth). ORD. *Irideæ*. A small genus (two species) of greenhouse, corm-rooted plants, natives of tropical and South Africa. Flowers in panicled spikes; perianth with a short, cylindrical tube dilated at the throat, and oblong, sub-equal segments; stamens inserted at the throat; filaments short; spathe-valves lanceolate, membranous, not lacerated. Leaves long-linear, rigid. The species *D. pendula* and *D. pulcherrima* were formerly classed under **Sparaxis**, and under that genus they will be found described on p. 464, Vol. III. For culture, *see* **Ixia.**

DIERVILLA. Bush Honeysuckle. SYNS. *Calyptrostigma*, *Calysphyrum*, *Weigela*, *Weigelia*. This genus embraces about seven species, natives of North-east America, China, and Japan. Diervillas may be readily accommodated, as they are dwarf as to stature, and whether grown in the shrubbery border or in beds they are equally effective when clad with their delightful flowers. They should be grown in a rich soil, and be top-dressed each season. Pruning consists in the removal of the thin, flowerless shoots.

To those described on p. 475, Vol. I., the following should be added :

D. arborea (tree-like). A synonym of *D. grandiflora*.

D. hortensis nivea (snow-white). *fl.* pure white, produced in great profusion. 1891. A beautiful shrub, thriving best on a loamy soil, and requiring a warm position.

Diervilla—*continued.*

D. lutea (yellow). A synonym of *D. trifida.*

D. præcox (early). *fl.* large, ten to fifteen in horizontal or slightly pendent trusses; tube rose-carmine with a carmine base, over 1in. long, the throat marked with a yellow band, edged with carmine, the lobes rosy-mauve, half-open. *l.* ovate, acuminate, finely toothed, hairy on both sides. Stems rounded; branches straight. *h.* 5ft. Japan, 1894. Allied to *D. grandiflora*, but flowers about a month earlier. (R. G. 1897, t. 1441.)

D. rosea. Illustrations of this and its variety *monstrosa* are given under **Weigelia.**

D. sessilifolia (stalkless-leaved). *fl.* honey-yellow, showy, narrow-funnel-shaped; corolla lobes nearly equal, shorter than the tube; cymes several-flowered. Early summer. *l.* ovate-lanceolate, gradually acuminate, closely sessile, acutely serrulated. Branchlets quadrangular. Eastern United States, 1889. (G. C. 1897, i., p. 17, f. 3.)

D. versicolor (various-coloured). A synonym of *D. floribunda.*

Varieties. Besides the species named there are some lovely varieties of garden origin which should be included:

ABEL CARRIERE,* rosy-carmine, large and free; BERANGER,* rose-purple, yellow throat; EVA RATHKE, rich purple, merging to crimson; and JEAN MACE, very deep purple. Still, one of the finest is VAN HOUTTEI* (Fig. 345), which was briefly noted in the work proper

FIG. 345. DIERVILLA VAN HOUTTEI.

DIETERIA. Included under **Aster** (which *see*).

DIETERICA. A synonym of **Caldcluvia** (which *see*).

DIETES. Included under **Moræa** (which *see*).

DIGITALIS. To the species, &c., described on pp. 475-6, Vol. I., the following should be added. One or two plants formerly included here are now classed under **Isoplexis.**

D. campanulata (bell-shaped). This name has been applied to a fine garden race of the common Foxglove, *D. purpurea.*

D. ciliata (ciliated). This perennial species is closely allied to *D. ambigua*, but differs in having campanulate flowers and a hairy calyx. June to September. Caucasus, 1892.

Digitalis—*continued.*

D. gloxinioides (Gloxinia-like). A form of *D. purpurea.*

D. purpurea gloxinioides (Gloxinia-like). A vigorous garden form, with larger, more abundant, and more distinctly spotted flowers than the type.

DIGLOSSOPHYLLUM SERRULATUM. This is synonymous with **Serenoa serrulata** (which *see*).

DILIVARIA. Included under **Acanthus** (which *see*).

DILLWYNIA. To the species described on p. 477, Vol. I., the following should be added:

D. Drummondi (Drummond's). *fl.* crimson, shaded with orange, two to five in a pedunculate, terminal corymb. June. *l.* narrow-linear, sub-terete, sulcate above; young ones slightly bristly or hispid towards the apex; adults all glabrous. Branches hispidulous. Australia (?), 1860. (R. G. 1863, t. 412, f. 1-5.)

D. pungens (sharp-pointed). A synonym of *Eutaxia pungens.*

DILOBA CÆRULEOCEPHALA. *See* **Figure-of-Eight Moth.**

DIMACRIA. Included under **Pelargonium** (which *see*).

DIMEROUS. Having the parts in twos.

DIMOCARPUS (in part). A synonym of **Nephelium** (which *see*).

DIMORPHA (of Schreber). A synonym of **Eperua** (which *see*).

DIMORPHANTHUS. To the species described on p. 477, Vol. I., the following variety should be added:

D. mandschuricus foliis-variegatis (variegated-leaved). *l.* green in the middle, the margins white. 1886. A handsome variety. (I. H. 1886, 609.) The correct name of *D. mandschuricus* is *Aralia chinensis elata.*

DIMORPHOTHECA. Including *Arnoldia.* To the species described on pp. 477-8, Vol. I., the following should be added:

D. annua (annual). A synonym of *D. pluvialis.*

D. Ecklonis (Ecklon's). *fl.-heads* 3in. across; ray florets purple outside, ivory-white inside; disk violet; peduncles 5in. to 8in. long, one-headed. *l.* sub-sessile, lanceolate or linear-lanceolate, 2in. to 3in. long, ¼in. to ½in. broad, acute, thickish, mid-ribbed. Stems suffruticose. *h.* 2ft. or more. 1897. (B. M. 7535.)

D. fruticosa (shrubby). *fl.-heads* 1½in. in diameter, pedunculate; ray florets whitish above and reddish or purplish beneath. Summer. *l.* alternate, obovate-spathulate, 2in. to 3in. long, tapering almost to a petiole at base, of thinner substance than most of the species. Stems 2ft. to 4ft. long, procumbent. 1887. Perennial.

D. nudicaulis graminifolia (naked-stemmed, Grass-leaved). The correct name of *D. graminifolia*

D. pluvialis (rainy). *fl.-heads* only opening for a few hours in the morning during fine weather; ray florets white above, purple beneath, 1in. long, minutely three-toothed; disk florets yellow, having taper-pointed lobes; peduncles 2in. to 3in. long. June to August. *l.* narrow-oblong or obovate-oblong, 1in. to 3in. long, toothed or incised, variably hairy or rough. *h.* 1ft. to 1½ft. South Africa, 1752. A pretty, erect or diffuse, simple or branched annual. SYNS. *D. annua, Calendula hybrida* (S. B. F. G. 39).

D. p. flore-pleno (double-flowered). This variety is distinguished from the type in having double flowers, which remain open all day. SYN. *D. Pongei flore-pleno* (of gardens).

D. Pongei flore-pleno (Ponge's double-flowered). A garden name for *D. pluvialis flore-pleno.*

DINEMA. Included under **Epidendrum** (which *see*).

DINETUS. A synonym of **Porana** (which *see*).

DIOCLEA. A synonym of **Arnebia** (which *see*).

DIOMEDEA. A synonym of **Borrichia** (which *see*).

DION. *See* **Dioon.**

DIOSCOREA. According to herbarium specimens, there are 150 known species of this genus, distributed over the whole area of the natural order. To those described on p. 478, Vol. I., the following should be added:

D. caucasica (Caucasian). *fl.* greenish, small, axillary. *l.* thick; upper ones nearly opposite; lower ones in whorls of three to five, varied in form, sometimes entire and cordate-ovate, sometimes sinuated and lobed. Stem glabrous. Rhizome thick, horizontal. Western Trans-Caucasian forests, 1894. A graceful climber for warm and shady nooks.

Dioscorea—*continued.*

D. crinita (hairy). *fl.* white; racemes very numerous, pendulous, solitary or several in the axils, 2in. to 3½in. long, forming a panicle at the ends of the branches. September. *l.* long-petiolate; leaflets five, 2in. to 3in. long, petiolulate, elliptic-lanceolate or oblanceolate, obtuse, acute or acuminate, with a long, bristly mucro. Natal, 1884. A slender, graceful, pubescent climber, forming an elegant pot plant when trained on a balloon trellis. (B. M. 6804.)

D. hybrida (hybrid). *fl.* greenish-yellow, in numerous axillary clusters. *l.* sub-cordate, attenuated. Tuber large, flat. 1883. This half-hardy twiner is supposed to be a hybrid between *D. Batatas* and *Tamus communis*. (R. H. 1882, p. 379.)

D. pyrenaica (Pyrenean). *fl.* solitary, rather remote, shortly pedicellate; perianth turbinate-campanulate, with oblong segments; male racemes axillary, twin or ternate, simple or rarely somewhat branched. July and August. *l.* sparse, deeply cordate-ovate, acute, mucronate. Stems one to four, slender, flexuous, branched. Underground caudex tuberous, about the size of a nut. *h.* about 3in. Pyrenees. Plant herbaceous, glabrous.

The following garden forms may be mentioned: *egregia*, leaves blotched with green in several shades; *Fargesii*, a hardy kind, with edible tubers; *prismatica*, leaves of a satin-like purplish-green, silvery-ribbed; and *racemosa*.

DIOSMA. To the information given on p. 479, Vol. I., the following should be added: Several plants formerly included hereunder are now referred to **Adenandra, Agathosma, Barosma,** and **Microstylis.**

D. ericifolia (Heath-leaved). A synonym of *D. vulgaris rubra.*

D. rubra (red). A form of *D. vulgaris.*

D. vulgaris longifolia (long-leaved). The correct name of *D. ericoides* (B. M. 2332).

D. v. rubra (red). *fl.* reddish. *l.* more rigid than in the type, erect. 1752. SYNS. *D. ericifolia* (A. B. R. 541), *D. rubra* (B. R. 563).

D. Wendlandi (Wendland's). A synonym of *Agathosma villosa.*

DIOSMEÆ. A tribe of **Rutaceæ** (which *see*).

DIOSPYROS. To the species described on p. 479, Vol. I., the following species and varieties should be added:

D. amplexicaulis (stem-clasping). A synonym of *D. leucomelas.*

D. Aurantium (orange). A variety of *D. Kaki.*

D. Berti (Bert's). A variety of *D. Kaki.*

D. coronaria (crowned). *fl.*, calyx spreading or slightly reflexed in fruit. *fr.* orange-red, sub-globose, 1in. in diameter. *l.* large, coriaceous. Japan, 1885. A small, hardy tree.

D. costata (ribbed). A variety of *D. Kaki.*

D. elliptica (elliptic). A variety of *D. Kaki.*

D. Kaki Aurantium (orange). *fr.* light orange-yellow, apple-shaped, depressed; calyx very large, with large, rhomboidal, jagged segments. (R. H. 1887, p. 349, f. 2.)

D. K. Berti (Bert's). *fr.* beautiful reddish-orange-yellow, depressed apple-shaped, large, smooth; basilar cavity broad and deep; summit umbilicate, with a narrow cavity. (R. H. 1887, p. 349, f. 3.)

D. K. elliptica (elliptic). *fr.* beautiful, shining orange-yellow, regularly elliptical, very smooth; basilar cavity very small; apical mucro scarcely visible. (R. H. 1887, p. 349, f. 4.)

D. leucomelas (white and black). *fl.* orange-red, one to three from the nodes, surrounded by several dry, persistent bracts; stamens thirty to forty. *fr.* globose, shining, 1¼in. broad. *l.* nearly sessile, oblong, obtuse, 4in. to 6in. long, cordate at base, rigidly coriaceous. Mauritius, 1851. A stove shrub or small tree. SYN. *D. amplexicaulis* (P. F. G. ii., p. 11, f. 139).

D. lobata (lobed). A synonym of *D. Kaki.*

D. Mazeli is a variety of *D. Kaki.*

D. Sahuti gallica (Sahut's French). *fr.* reddish-yellow and golden, covered with a silvery bloom, apple-shaped, acuminate at summit; surface smooth and rounded; basilar cavity almost absent; umbilical cavity absent and replaced by a slight, characteristic, angular elevation. (R. H. 1887, p. 349, f. 5.)

D. Wiseneri (Wisener's). *fl.*, calyx lobes having a short, central lobe. *fr.* egg-shaped, obscurely ribbed. *l.* elongate-ovate, shortly attenuated, and rounded at apex. Japan, 1887. Hardy. Probably a variety of *D. Kaki.*

DIOTIS. *Otanthus* is synonymous with this genus.

DIPCADI. The species, which now number about twenty-seven, are tuberous, scapigerous herbs. To those described on p. 480, Vol. I., the following should be added:

D. tacazzeanum (Tacazze River). *fl.* green, drooping, ½in. long; raceme laxly six- to twelve-flowered; peduncle slender, 6in. to 9in. long. *l.* two or three, linear, flat, 3in. to 4in. long. Nile region, 1892. SYN. *Uropetalum tacazzeanum* (R. G. 1892, p. 611, f. 127).

DIPERA. A synonym of **Disperis** (which *see*).

DIPETALOUS. Having two petals.

DIPHYES. A synonym of **Bulbophyllum** (which *see*).

DIPIDAX. SYN. *Melanthium.* ORD. *Liliaceæ.* A small genus (two species) of greenhouse perennials, with small, spicate, sub-sessile flowers, a few clustered leaves, and erect, simple stems, confined to South Africa. Both of them—*D. ciliata* and *D. triquetra*—have been introduced, but they are not of much horticultural value.

DIPLADENIA. About two dozen species, all natives of tropical America, are included in this genus. Calyx five-parted, the segments lanceolate; corolla funnel- or almost salver-shaped, with five spreading, twisted lobes. To the species described on pp. 480-1, Vol. I., the following should be added:

D. acuminata (taper-pointed). *fl.* of a fine, deep rose-colour, streaked with deeper red at the throat, 4in. across; raceme sub-paniculate, many-flowered. July. *l.* opposite, shortly petiolate, ovate or elliptic, shortly acuminate. Brazil, 1854. A glabrous climber. (B. M. 4828.)

D. atropurpurea (dark purple). *fl.* deep velvety maroon, with a tube 2in. long; peduncles two-flowered, axillary, rather longer than the leaves. July. *l.* ovate, acute, about 2in. long; petioles ¼in. long. Brazil, 1814 and 1890. Plant glabrous. (F. d. S. 29.) SYN. *Echites atropurpurea* (B. R. 1843, t. 27).

D. a. Clarkei (Clarke's). *fl.* of an intense crimson, shaded with velvety black, 2½in. across; tube paler than the rest, veined with crimson. *l.* rather small. 1892.

D. eximia (choice). *fl.* of a rich rose-red, 2½in. across, disposed in cymose racemes. *l.* elliptical or orbicular, nearly 2in. long. Brazil (?), 1883.

D. flava (yellow). A synonym of *Urechites suberecta.*

D. illustris glabra (remarkable, smooth). *fl.* rosy-red, 3in. to 3½in. across, four to eight in a terminal raceme; lobes orbicular-ovate, obtuse; filaments very short. July. *l.* exstipulate, shortly petiolate, oblong or rounded, obtuse or sub-acute at apex, rounded or sub-cordate at base. Brazil, 1891. A handsome, glabrous climber. (B. M. 7156.)

D. profusa (profuse). A variety of *D. splendens.*

D. Sanderi (Sander's). *fl.* rose-coloured, 3in. long and broad. *l.* thick, oblong, acuminate, 2in. long; petioles ½in. long. Brazil, 1896. Allied to *D. eximia.*

D. speciosa (showy). This is said to be a garden hybrid, of which *D. Brearleyana* is one of the parents. 1897.

D. urophylla (tail-leaved). *fl.* salmon-yellow, four to six in a loose, nodding raceme; calyx segments subulate; corolla-tube narrowed at base, then almost campanulate, the lobes of the limb rounded and spreading. *l.* oblong-ovate, narrowed to a long point; petioles rather long. *h.* 3ft. Brazil, 1847. Plant highly glabrous. (B. M. 4414; F. d. S. v., t. 425; P. M. B. xvi., p. 66.)

DIPLARRHENA (from *diploos*, double, and *arrhen*, male; in allusion to the two perfect stamens). ORD. *Irideæ.* A monotypic genus. The species is a greenhouse plant, with a short rhizome, closely allied to **Libertia** (which *see* for culture).

D. Moræa (Moræa). *fl.* whitish, rather fugitive; outer segments with a reflexed blade and a cuneate claw; inner ones one-third shorter, much narrower, connivent; cluster terminal, solitary, with several reduced, sheathing leaves. *l.* six to eight in a tuft, sheathing, linear, 1ft. to 1½ft. long, ¼in. to ½in. broad. Australia, 1873.

DIPLAZIUM. *D. decurrens* is a synonym of *Asplenium maximum*, and *D. umbrosum* is identical with *A. radicans.*

DIPLECOSIA. A synonym of **Diplycosia** (which *see*).

DIPLECTHRUM. A synonym of **Satyrium** (which *see*).

DIPLOCALYX. A synonym of **Mitraria** (which *see*).

DIPLOCOMA. A synonym of **Heterotheca** (which *see*).

DIPLOCYATHA (from *diploos*, double, and *kyathos*, a cup; in allusion to the shape of the flowers). ORD. *Asclepiadeæ.* A monotypic genus. The species, *D. ciliata* (SYN. *Stapelia ciliata*), is a greenhouse plant, native of South Africa; it is remarkable on account of the large, tubular process arising from near the bottom of the corolla-tube, but is probably no longer in cultivation.

DIPLODIA. *See* **Sphæropsideæ.**

DIPLOGLOSSIS. A synonym of **Cynanchum** (which *see*).

DIPLOGLOTTIS (from *diploos*, double, and *glottis*, a tongue; in reference to the divided inner scale of the petals). ORD. *Sapindaceæ*. A monotypic genus. The species is a greenhouse tree, closely allied to **Cupania** (which *see* for culture).

D. Cunninghamii (Cunningham's). *fl.* green, numerous, in ample, axillary panicles. May. *l.* sometimes 2ft. long; leaflets eight to twelve, opposite or irregularly alternate, oblong-elliptic to ovate-lanceolate, 6in. to 12in. long, glabrous above, pubescent beneath. *h.* 30ft. to 40ft. Sub-tropical Australia, 1825. SYN. *Cupania Cunninghamii* (B. M. 4470).

DIPLONEMA. A synonym of **Euclea** (which *see*).

DIPLONYX. A synonym of **Wistaria** (which *see*).

DIPLOPAPPUS CHRYSOPHYLLUS. A garden name for **Cassinia fulvida** (which *see*).

DIPLOPELTIS (from *diploos*, double, and *pelte*, a shield; in allusion to the double fruit). ORD. *Sapindaceæ*. A small genus (three species) of glandular-pubescent, greenhouse shrubs or under-shrubs, natives of South-west Australia. Flowers white, pink, or violet, large for the order, polygamous; sepals five; petals four, the place of the fifth vacant, clawed; stamens eight; panicles terminal, with scorpioid racemes. Leaves alternate, entire or pinnatifid. *D. Huegelii*, the only species introduced, thrives in a compost of loam and peat, and may be increased by cuttings, inserted in heat.

D. Huegelii (Huegel's). *fl.* pink and white, racemose along the simple branches of a terminal panicle. July. *l.* either undivided and entire, toothed, or pinnatifid. *h.* 1ft. to 3ft. 1837. (B. R. 1839, t. 69.)

DIPLOPHYLLUM. Included under **Veronica** (which *see*).

DIPLOPRORA (from *diploos*, double, and *prora*, a front). ORD. *Orchideæ*. A monotypic genus. The species, *D. Championi* (SYN. *Cottonia Championi*), is a stove or greenhouse, epiphytal Orchid, native of India and Hong Kong. It has a few small, yellow flowers, with a rosy-tinged lip, ovate or oblong distichous leaves, and a nearly simple stem. The plant is in the Kew Collection, but is not in general cultivation.

DIPLORA (from *diploos*, double, and *lora*, thongs; in allusion to the strap-shaped valves of the involucre). ORD. *Filices*. A monotypic genus. The species is a stove Fern, in habit resembling *Asplenium vittæforme*. For culture, *see* **Asplenium.**

D. integrifolia (entire-leaved). *rhiz.* wide-creeping, green, woody. *sti.* naked, greenish, scarcely 1in. long, articulated at base. *fronds* 9in. to 10in. long, seldom exceeding ¼in. in breadth, entire, linear-ligulate, parchment-like, narrowed to both ends. *sori* conspicuous, ¼in. to ½in. long, fifty to sixty on each side of the midrib. Solomon Islands.

DIPLOSASTERA. Included under **Coreopsis** (which *see*).

DIPLOSIS. A genus of very minute insects belonging to the order *Diptera*, containing several species more or less hurtful in gardens. *D. pyrivora*, or **Pear Midge** (which *see*) is the most important. Another species is found upon **Populus** (which *see*), and yet another calling for mention is the Ash Midge (*D. botularia* or *D. fraxini*). This latter is responsible for a premature yellowing of the foliage of Ash, as well as for distorting it by thickening it in the vicinity of the midrib and folding over the sides of the leaves, so that they look like a pod. The larvæ are reddish-yellow, and when ready to pupate they escape through a crack in the gall and fall to the ground. All leaves affected in the way suggested should be collected and burned.

DIPLOTHEMIUM. SYN. *Allagoptera*. Five species, all Brazilian, form this genus, which is closely allied to *Cocos*. To those described on p. 482, Vol. I., the following should be added:

D. littorale (shore-loving). *fl.*, spadices 2ft. to 3ft. long; outer spathe 3in. to 4in. long; inner one 1½ft. to 2ft. long, deeply sulcate, slightly fuscous-tomentose. *l.* nearly 3ft. long, almost straight; pinnæ fifty or more on each side, rigid, approximating in twos or fours, linear, acuminate. Brazil, &c. Plant stemless. (B. M. 4681.)

DIPLYCOSIA (from *diploos*, double, and *kos*, covering; two connate bractioles form a second covering to the flower). SYNS. *Amphicalyx*, *Diplecosia*. ORD. *Ericaceæ*. A genus consisting of seven species of greenhouse, epiphytal shrubs, all Malayan, and only differing from **Gaultheria** (which *see* for culture) in the anther-cells having no apical horns. Only one species has been introduced.

D. discolor (two-coloured). *fl.* in pubescent racemes, 2in. long; corolla white, the mouth red within, ⅛in. by ⅛in., ovoid. *l.* ovate or elliptic, 2in. long, narrowed at both ends, serrated, very white beneath; petioles ⅛in. long. Bhotan, 1858. Habit of *Gaultheria fragrantissima*. SYN. *Gaultheria discolor* (B. H. 1858, p. 193, t. 52, f. 2; B. M. 5034).

DIPODIUM (from *dis*, twice, and *pous*, *podos*, a foot; in allusion to the caudicles on the pollen masses). ORD. *Orchideæ*. *Dipodium* is the correct name of the genus described on pp. 190-1, Vol. IV., as **Wailesia.** The following species should be added:

D. paludosum (swamp-loving). *fl.* creamy-white, blotched with purple, sweet-scented, 1½in. across, ten to twelve in a raceme; sepals and petals reflexed; lip lanceolate, acute, with a villous ridge from the base to the cuspidate tip, the side lobes reduced to small teeth. *l.* ensiform, erect. Stem 1ft. to 2ft. high; peduncle 1ft. to 2ft. high; both erect. Malacca (in swamps), 1883.

DIPOSIS (from *dis*, twice, and *pois*, a husband; the umbellules are usually three-flowered, and comprise one fertile, sub-sessile flower and two sterile pedicellate ones). ORD. *Umbelliferæ*. A monotypic genus: the species, *D. Bulbocastanum*, introduced in 1872, is a greenhouse or half-hardy tuberous plant of more botanical than horticultural interest.

DIPSACOZAMIA. A synonym of **Ceratozamia** (which *see*).

DIPSEUDOCHORION. A synonym of **Limnophyton** (which *see*).

DIPTERACANTHUS SCANDENS. A synonym of **Asystasia scandens** (which *see*).

DIPTERIS. *See* **Polypodium.**

DIPTERYX includes *Comarouna*.

DIRCÆA. Included under **Gesnera** (which *see*).

DISA. Flowers variously disposed, large or small; sepals much larger than the petals, the dorsal one erect, hooded, and having a spur; petals small, polymorphous; lip small, spurless, linear, acute, projecting forward; column short, rather thick; bracts usually shorter than the flowers. Stems sometimes tall and leafy, sometimes slender and few-leaved or with the leaves reduced to sheathing bracts. The utility of this lovely genus has been considerably increased of late years by the successful introduction of several beautiful hybrids. These hybrids have proved far more amenable to culture than the imported species, and are often found to thrive well where failure has followed every endeavour in attempting the culture of the African kinds. They are worthy of attention, and should be fully represented for grouping with other Orchids at exhibitions; while for cut-flower purposes these hybrid Disas will be found most useful.

Disas are not so extensively cultivated as their merits deserve. No doubt the cause of this is the repeated failures that have been experienced in many collections to produce satisfactory results from *D. grandiflora* (Fig. 346). The cause of such failure is oftener due to unsuitable locality than to lack of ability on the part of the cultivator. We have known cases where, without any exceptional attention, these plants have been everything that could be desired. In one instance the plants were placed in a Heathhouse, and we had the pleasure of seeing them in flower recently after a lapse of sixteen years, and their condition was eminently satisfactory. They had the full benefit of free ventilation throughout the year, and, except to exclude frost, no fire heat was used. During the growing season the plants are freely syringed overhead, and a liberal supply of moisture is afforded at the roots. The shading used is only sufficient to prevent scorching of the foliage during the hottest parts of the day. The potting compost consists of good fibrous peat, living sphagnum, and a liberal proportion of rough sand and broken pot-sherds intermixed. Ample drainage is also given. There are instances of *D. grandiflora* having been grown

Disa—*continued.*

successfully for many years, and then having suddenly failed. This is often brought about after a lengthened period of dry weather. Thrips play havoc in a season of this description, and as an abundance of ventilation is necessary under such conditions, these pests thereby obtain free access to the house and quickly attack the tender shoots, disfiguring and often destroying them. Fumigation is naturally resorted to, but the remedy is worse than the disease, and many fine batches of plants have thus been destroyed. No apparent ill-effects will be observed for a few days, but suddenly a black spotting appears on the leaves, and this passes into the stems, and continuing

FIG. 346. DISA GRANDIFLORA.

a downward course finally ends in the total decay of the growths. If the tubers escape injury (which is rarely the case) they commence growing again after a short period, but it takes a considerable time for plants thus weakened to regain their vigour. Where Thrips are observed the plants should be frequently sprayed overhead with weak tobacco-water or some non-injurious (so far as the plants are concerned) insecticide, or the plants may be dipped; but in this case great care must be taken, as the growths are so brittle that they quickly break should they come in contact with the sides of the bath.

Disa—*continued.*

To the species described on pp. 483-4, Vol. I., the following should be added:

D. atropurpurea (dark-purple).* *fl.* rich purplish-lake, solitary, on slender peduncles 3in. to 4in. high; dorsal sepal hooded, with a very short, knob-like spur, the lateral ones elliptic-lanceolate, acute; petals auricled at base, bifid at apex; lip with a distinct stalk ¼in. long, and a cordate, acuminate, wavy-margined blade, having two or three teeth on each side. *l.* linear, Grass-like. South Africa, 1885. A beautiful little plant. (B. M. 6891.)

D. Cooperi (Cooper's). *fl.* strongly Clove-scented; dorsal sepal pale, attenuated into a long horn, the lateral ones pink, reflexed; petals dolabriform, retuse; lip greenish-yellow, broadly ovate; bracts large, tipped with chestnut-red at apex; spike robust, many-flowered. February. *l.* narrowed to the petioles. Natal. (B. M. 7256; G. C. 1892, xii., p. 268, f. 45.)

D. crassicornis (thick-horned). The correct name of *D. megaceras.*

D. graminifolia (Grass-leaved). *fl.* bright azure-blue; dorsal sepal having an acute, erect helmet, and a short spur; the lateral sepals obtuse; lip obtuse, toothed at apex, alternately striped with white and reddish-violet on the disk; column tipped with reddish-violet; scape erect, few-flowered, with numerous bracts. *l.* few, cylindrical, filiform, appearing after the flowers. *h.* 1½ft. South Africa, 1825 and 1888. (J. L. S. xix., t. 34; W. O. A. ix., t. 399.)

D. incarnata (flesh-coloured). *fl.* orange-red (but probably varying), 1in. across; spur of the dorsal sepal as long as the blade; petals dimidiate-ovate; lip narrow-linear, deflexed; bracts spathe-like; spike rather dense. April. *l.* elongated-linear. Stem leafy. Madagascar, 1892. (B. M. 7243; G. C. 1892, xi., p. 619, f. 88; G. M. 1892, p. 157.)

D. lacera (torn). *fl.* blue or white; upper sepal helmet-shaped, with a short spur, the side ones somewhat boat-shaped; lip with an abruptly-hooked apical part, lacerated, or fringed at the apex only, or nearly or quite entire; stems 10in. to 12in. high, leafless. *l.* linear-filiform. South Africa, 1826.

D. l. multifida (much-cleft). *fl.* violet outside, blue within; lip more or less fringed from base to apex. 1888. (B. M. 7066; G. C. 1888, iv., p. 664, f. 93.)

D. macrantha is synonymous with *D. crassicornis.*

D. megaceras. The correct name is *D. crassicornis.*

D. nervosa (nerved).* *fl.* bright rose-coloured, disposed in racemes, and borne on erect scapes 2ft. high; segments spreading; spur straight, about 1in. long. *l.* strap-shaped. Natal, 1894. A handsome species. (G. C. 1894, xvi., p. 308, f. 41.)

D. pulchra (pretty). *fl.* pale lilac and purple, 2in. across; spur, including the base of the perianth tube, 2in. long; raceme erect, 6in. long. Stems 2ft. long, leafy. Tubers large. South Africa, 1895.

D. racemosa (racemose). *fl.* light purple, marked white, dark purple, and green; middle sepal rhombic, the lateral ones oblong; petals cuneate-triangular, serrated on the upper margin, with inflexed apex; lip rhombic-lanceolate, narrow, small; inflorescence one-sided, about six-flowered. 1887. (B. M. 7021; G. C. 1887, iii., p. 593, f. 81; Gn., 1891, p. 10, t. 786; J. H. 1888, xvii., p. 221, f. 25; W. O. A. viii., t. 356.) SYN. *D. secunda.*

D. sagittalis (sagittate). *fl.* pale lilac, with red streaks on the petals and lip, about ⅝in. long, disposed in a somewhat corymb-like raceme. May. *l.* radical, 2in. to 4in. long, oblanceolate, bright green. Stems 6in. to 8in. high, dark brown. Tuber fusiform. South Africa. (B. M. 7403.)

D. secunda (side-flowering). A synonym of *D. racemosa.*

D. tripetaloides (three-petal-like). *fl.* creamy-white, flushed with pale pink and dotted with crimson, 1in. across, fifteen to thirty in a rather loose raceme; lateral sepals rather large; petals falcate; lip linear-oblong; scape erect, clothed below with large bracts. *l.* rosulate, lanceolate, acuminate, shining, coriaceous. South Africa, 1889. (B. M. 7206; G. C. 1890, vii., p. 768, f. 127; W. O. A. x., t. 462.)

The following species are also grown at Kew, but are rarely met with: *D. chrysostachya, D. Draconis, D. rosea, D. rufescens.*

Appended is a list of hybrid Disas, with their recorded parentage.

Diores	*Veitchii* and *grandiflora* (Veitch).
Diores Clio	*grandiflora* and *Veitchii* (Veitch).
kewensis	*grandiflora* and *tripetaloides* (Kew).
langleyensis.....	*racemosa* and *tripetaloides* (Veitch).
Premier	*tripetaloides* and *Veitchii* (Kew).
Veitchii.....	*grandiflora* and *racemosa* (Veitch).

DISARRENUM. A synonym of **Hierochloe** (which *see*).

DISCANTHERA. A synonym of **Cyclanthera** (which *see*).

DISCANTHUS. A synonym of **Cyclanthus** (which *see*).

DISCHIDIA. SYNS. *Collyris*, *Conchophyllum*, *Leptostemma*. Leaves sometimes forming into pitchers. To the species described on p. 484, Vol. I., the following should be added:

D. hirsuta (hairy). *fl.* blood-red; corolla ¼in. long, the throat having two rows of hairs. *l.* ⅜in. to 1in. long, sessile, broadly ovate, acute, fleshy, the two or three pairs of nerves very prominent above. India and Java, 1896. Plant slender, papillose, and more or less pubescent.

D. Rafflesiana (Raffles'). *fl.* yellowish, fleshy, ¼in. long. *l.* very similar to those of *D. hirsuta*, but not papillose, changing into oblong pitchers 2in. to 5in. long, obtuse, fleshy, the cavity being filled with rootlets from the adjoining node. Stem stout. Malay Archipelago, &c. (F. d. S. 1592-3; T. L. S. xx., 396, t. 17-18.)

DISCOCAPNOS. Included under **Fumaria** (which *see*).

DISCOLOR. Of more than one colour; variegated.

DISELMA. A synonym of **Fitzroya** (which *see*).

DISEMMA AURANTIA. A synonym of **Passiflora Banksii** (which *see*).

DISPERIS (from *dis*, double, and *pera*, a pouch; in allusion to the form of the sepals). SYNS. *Dipera*, *Dryopeia*. ORD. *Orchideæ*. A genus including about a score species of stove or greenhouse, terrestrial Orchids, usually small and slender, natives of the East Indies, tropical and South Africa, and the Mascarene Islands. Flowers solitary or racemose; dorsal sepal erect, galeate or calcarate, the lateral ones spreading or oblique, free or more or less united; petals united to the dorsal sepal, falcately curved, usually constricted in the middle and obliquely acute or lobed at apex; lip adnate to the face of the column, long-clawed above it, variously curved within the galea; column erect, very stout. Leaves one or few, alternate, or limited to a single opposite pair. Tubers ovoid. For culture of *D. Fanniniæ*, which is probably the only species now grown in this country, *see* **Disa**.

D. Fanniniæ (Mrs. G. Fannin's). *fl.* pure white with a purple tinge and having raised, purple dots on the petals, one to four in a leafy spike; bracts like the leaves, but smaller. *l.* 2in. to 2½in. long, cordate-amplexicaul, tapering to an acute point. Stem 5in. to 15in. high, weak, bearing three or four leaves. South Africa, 1889.

DISPHENIA. *See* **Cyathea.**

DISPORUM. SYN. *Drapieza*. To the species described on pp. 484-5, Vol. I., the following should be added:

D. Hookerii is regarded by J. G. Baker as a form of *D. lanuginosum*.

D. Leschenaultianum (Leschenault's). *fl.* white, ½in. to ⅝in. in diameter, sub-campanulate, two to five together in the uppermost axils; segments oblong or linear-oblong. Spring. *l.* rather rigid, 1in. to 4in. long, 1in. to 2in. broad, narrowed to distinct petioles, varying from elliptic-lanceolate to almost orbicular, cuspidate, acute, acuminate, or almost caudate. *h.* 1ft. to 2ft. Mountains of South India and Ceylon. (B. M. 6935.)

D. L. variegatum (variegated). *fl.* greenish-white, small. *fr.* black. *l.* ovate, light green, streaked with white and grey. Stems slender, succulent. Southern India and Ceylon, 1897.

DISSOCHROMA. *See* **Dyssochroma.**

DISSOTIS (from *dissoi*, of two kinds; the anthers are of two different forms). SYN. *Osbeckiastrum*. ORD. *Melastomaceæ*. A genus comprising twenty-two species of stove or greenhouse herbs or small shrubs, usually pubescent, natives of tropical and South Africa. Flowers rose, purple, or violet, usually large, solitary, capitate, or panicled; calyx lobes four or five, often bristly; petals four or five, obovate; stamens eight or ten, very unequal. Leaves ovate or oblong, three- to five-nerved. For culture of the two species introduced, *see* **Melastoma.**

D. canescens (hoary). A synonym of *D. incana*.

D. incana (hoary). *fl.* rose-purple, 1in. to 1½in. in diameter, in sub-terminal, leafy panicles, crowded, shortly pedicellate. June. *l.* 2in. to 3in. long, ½in. to ¾in. broad, sub-sessile, coriaceous, linear or linear-oblong, obtuse, entire. Stem 2ft. to 3ft. high, purple, four-angled. Tropical and South Africa, 1838. Stove or greenhouse shrub. (G. C. 1891, ix., p. 204, f. 46.) SYNS. *D. canescens*, *Osbeckia canescens* (B. M. 3790).

D. Irvingiana (Irving's). *fl.* reddish-purple, copious, 1in. to 1¼in. in diameter, solitary, or two to five in axillary and terminal cymes; petals obovate. *l.* 2in. to 3in. long, ½in. to ¾in. broad, linear-oblong or oblong-lanceolate, acute, three-nerved. Stem 1ft. to 3ft. high, erect, four-angled. Upper Guinea, 1859. Stove annual. (B. M. 5149.)

DISTANT. Separated by large intervening spaces.

DISTEGANTHUS. This is a monotypic genus, the only species being a stove herbaceous plant, requiring similar culture to **Billbergia** (which *see*). It is allied to *Cryptanthus*, but is readily distinguished by its lateral inflorescence.

D. basilateralis (broad at base). *fl.* in several dense, oblong spikes, 2in. to 3in. long, produced direct from the rhizome outside the rosette of leaves; petals bright yellow, the oblong blade protruding ½in. from the calyx. *l.* six to ten, cordate-oblong, acute, 6in. to 12in. long, white-lepidote at back, deeply channelled; petioles 2in. to 3in. long. Rhizome wide-creeping. French Guiana, 1846. (F. d. S. 227.)

D. Moensi (Moens'). A synonym of *Distiacanthus Morrenianus*.

D. scarlatinus is referred to *Distiacanthus*.

DISTIACANTHUS (from *distichos*, two-ranked, and *akanthos*, a spine; in allusion to the spines on the leaves). ORD. *Bromeliaceæ*. A small genus (two species) of stove, herbaceous plants, natives of Colombia and the Amazon Valley. Flowers borne in a central head; sepals united in a short tube above the top of the ovary; petals lingulate, much longer than the sepals, but spreading only at the tip; stamens much shorter than the petals. Leaves oblong, petiolate, spiny on the margins. For culture, *see* **Billbergia.**

D. Morrenianus (Morren's). *fl.* yellowish, in a dense, sessile head, subtended by the lanceolate, reduced inner leaves. *l.* 1ft. long, green or tinged with brown, about twenty in a rosette, with a broad, channelled petiole 6in. to 8in. long, and copious spreading prickles. Para, 1873. SYNS. *Cryptanthus Morrenianus* and *Disteganthus Moensi*.

D. scarlatinus. The correct name of the plant described on p. 485, Vol. I., as *Disteganthus scarlatinus*. *fl.* in a dense head, overtopped by the reduced inner leaves; petals purplish-red, with a white margin. *l.* twelve to twenty in a rosette, 1ft. long, on petioles the same length; spines copious, deflexed. SYN. *Bromelia scarlatina*.

DISTICTIS (from *dis*, twice, and *stiktos*, spotted; the much compressed seeds appear like two rows of spots in the capsule). ORD. *Bignoniaceæ*. A genus embracing seven or eight species of stove, climbing, often tomentose-pubescent shrubs, natives of tropical America, from Brazil to the West Indies. Flowers usually white, paniculate, thyrsoid, or racemose; calyx campanulate, truncately five-lobed or five-toothed; corolla tube elongated, often incurved, the limb somewhat bilabiate, with five rounded lobes; stamens four, didynamous. Leaves trifoliolate or the terminal leaflet changed into a tendril; leaflets stalked, entire. *D. lactiflora* (described on p. 189, Vol. I., as *Bignonia lactiflora*) is the only species calling for mention here. For culture, *see* **Bignonia.**

DISTINCT. Unconnected; the reverse of coherent.

DISTREPTA. A synonym of **Tecophilæa** (which *see*).

DITTMARIA. A synonym of **Erisma** (which *see*).

DITULA ANGUSTIORANA. *See* **Vine Moths.**

DIURIS. Flowers one, two, or several in a terminal raceme, often rather large and conspicuous from the antennæ-like green lateral sepals, the rest of the perianth yellow, purple, or white, often bright yellow with deep purple spots or blotches, the prominent petals often very spreading, the shorter dorsal sepal closely embracing the column at base; lip deeply three-lobed. Leaves narrow.

DIURNAL. A term applied to flowers which are open during the day but close at night.

DIURNI. *See* **Lepidoptera.**

DIUROGLOSSUM. A synonym of **Guazuma** (which *see*).

DIVIDED. Cut down to the midrib.

DIVISION. *See* **Propagation.**

DIZYGOTHECA LEPTOPHYLLA. According to Hemsley, this is the correct name of **Aralia leptophylla** (which *see*).

DODARTIA (named in honour of F. Dodart, M.D., a French botanist). ORD. *Scrophularineæ*. A monotypic genus. The species, *D. orientalis* (B. M. 2199; S. B. F. G. 147), is an erect, branched herb, native of Central and Western Asia, with purplish flowers and linear, entire leaves. It has been introduced, but is probably not now in cultivation.

DODECATHEON. This genus is confined to North America and North-eastern Asia. To the species, &c., described on pp. 485-6, Vol. I., the following should be added:

D. Lemoinei (Lemoine's). A garden hybrid between *D. integrifolium* and *D. Meadia lancifolium*. 1889.

D. Meadia Clevelandi (Cleveland's). *fl.* violet-blue, with a yellow and black centre. *h.* 1ft. to 1½ft. California, 1890.

D. M. splendidum (splendid).* *fl.* deep crimson, with a yellow ring at the orifice of the reflexed corolla; scape four- to ten-flowered. Spring. 1883.

D. splendidum (splendid). A garden name for *D. Meadia.*

Varieties. Several very desirable hybrid Dodecatheons have been raised, of which the following are worthy of note:

JAMES COOKE, rose-lilac, scarlet eye, edged yellow; LONGFELLOW, blush pink, maroon eye; ROSY GEM, pale rose, carmine eye; SNOWFLAKE, white, maroon eye; and VICTOR HUGO, blush white, maroon eye.

DOG-BERRY. *See* **Cornus sanguinea.**

DOG-BRAMBLE. *See* **Ribes Cynosbati.**

DOG'S CABBAGE. *See* **Thelygonum.**

DOGWOOD, JAMAICA. *See* **Piscidia.**

DOGWOOD, SWAMP. *See* **Ptelea trifoliata.**

DOGWOOD, VICTORIAN. *See* **Prostanthera.**

DOLIA (from *dolios*, deceptive; the plants closely resemble *Salsola*, to which, however, they are not related). SYNS. *Alibrexia*, *Aplocarya*. ORD. *Convolvulaceæ*. A genus embracing about a dozen species of stove or greenhouse, hairy or tomentose herbs or small shrubs, inhabiting the sea-shores of Peru and Chili. Flowers sub-sessile or pedicellate; calyx five-cleft or five-parted; corolla funnel-shaped, five-lobed. Leaves alternate, nearly opposite, or fascicled, small, rather thick. *D. revoluta* and *D. tomentosa* (both formerly classed under *Alona*) have been introduced, but are probably lost to cultivation.

DOLICHANDRA. Included under **Macfadyena** (which *see*).

DOLICHANDRONE. Including *Spathodea* (in part). ORD. *Bignoniaceæ*. A genus embracing about a dozen species of stove trees, inhabiting the hotter parts of Africa, Asia, and Australia. Flowers in terminal racemes or panicles; calyx cleft to the base on one side, spathaceous; corolla limb of five sub-equal lobes. Leaves opposite, pinnate. *D. Rheedii* (SYNS. *Spathodea longiflora* and *S. Rheedii*) has been introduced, but perhaps it is not now grown.

DOLICHODERIA. Included under **Achimenes** (which *see*).

DOLICHONEMA. A synonym of **Moldenhawera** (which *see*).

DOLICHOS. *Lablab* (*Lablavia*), which is kept distinct on p. 223, Vol. II., is included hereunder by the authors of the "Genera Plantarum." Numerous species have been described, but probably not more than a score are distinct as such. To those given on p. 486, Vol. I., the following should be added. For other species formerly included here, *see* **Canavalia, Glycine, Phaseolus,** and **Vigna.**

D. hirsutus (hairy). A synonym of *Pueraria Thunbergiana.*

D. japonicus (Japanese). A synonym of *Pueraria Thunbergiana.*

D. Lablab (Lablab). The correct name of *Lablab vulgaris.* SYNS. *D. lignosus*, *D. purpureus* (B. R. 830; S. E. F. 74).

D. lignosus is identical with *D. Lablab.*

D. purpureus (purple). A synonym of *D. Lablab.*

D. sesquipedalis (sesquipedal). *fl.* whitish, solitary or twin at the ends of the peduncles. *fr.*, pods sub-cylindrical, pendent, mucronate-uncinate at apex. *l.*, leaflets broadly ovate, acute, dark green. Stems glabrous, twining. *h.* 6ft. to 8ft. South America. Annual.

D. simplicifolius (simple-leaved). *fl.* pink, Pea-shaped, fascicled in the axils, erect, as long as the pedicels (½in.). April. *l.* simple, lanceolate, 6in. long, very shortly petiolate. Stems and branches herbaceous, erect, simple. Caudex thick, woody, tuberous. Tropical Africa, 1892. Stove. (B. M. 7318.)

D. unguiculatus (clawed). A synonym of *Vigna Catiang.*

DOLIOCARPUS. SYN. *Othlis.* About eighteen species are included hereunder. Flowers white or yellow, solitary or few in panicles, rarely axillary. Leaves parallel-penninerved.

DOMBEYA. Assonia and **Astrapæa** (kept distinct in this work) are included hereunder by the authors of the "Genera Plantarum." To the information given on p. 486, Vol. I., the following should be added:

D. acutangula (acute-angled). The correct name of *Astrapæa tiliæfolia.*

D. cannabina (Hemp-like). The correct name of *Astrapæa viscosa* (B. M. 4544).

D. Cayeuxii (Cayeux'). *fl.* disposed in axillary, pendent, many-flowered umbels; corolla of a beautiful pink, finely veined. *l.* cordate, acute, toothed, dark-green, strongly reticulated; petioles 4in. to 6in. long. Stems hispid. 1897. A magnificent hybrid (the first in the genus) between *D. Mastersii* and *D.* (*Astrapæa*) *Wallichii.* 1897. (R. H. 1897, p. 544.)

DOMBEYA (of La Marck). A synonym of **Araucaria** (which *see*).

DOMBEYA (of L'Héritier). A synonym of **Tourretia** (which *see*).

DONATIA. A synonym of **Avicennia** (which *see*).

DONAX. A synonym of **Arundo** (which *see*).

DONDISIA (of Reichenbach). A synonym of **Hacquetia** (which *see*).

DONIA (of G. Don). A synonym of **Clianthus** (which *see*).

DONIA (of R. Brown). A synonym of **Grindelia** (which *see*).

FIG. 347. DOODIA ASPERA MULTIFIDA.

DOODIA. The five species included in this genus are confined to the islands from Ceylon eastward to Fiji, New Zealand, and Australia. With the exception of *D. blechnoides*, the members of this genus are small but decorative. They are especially useful for Fern-cases and for edgings of window-boxes filled with taller-growing kinds. *D. caudata* is the most useful species grown, but *D. media* (Fig. 348) is an exceedingly pretty plant for greenhouses. Although some Doodias grow more luxuriantly in a stove temperature, and produce more massive foliage under such treatment, none of them actually require great heat; the cool and intermediate houses are the places suitable to all of them. They are also very useful for forming an undergrowth in cool houses devoted to either Orchids, Palms, or flowering subjects. They are seldom infested with insects, and they bear fumigation without injury. As they are of a very accommodating nature, Doodias, when planted under or grown amongst other plants, bear with impunity the syringings that may be found necessary

Doodia—*continued.*

to the welfare of the latter, or do equally well without, as the case may be. They should be potted in a compost of three parts peat and one of silver-sand, with a little chopped sphagnum added. The drainage, especially when they are grown in pots, must be good, and none of them like exposure to the full rays of the sun. Propagated by means of spores, or by the division of the crowns in early spring.

To those described on p. 486, Vol. I., the following varieties should be added:

D. aspera multifida (many-cleft). *fronds* arched, several times forked at the apex; when young, claret-coloured. Dwarf evergreen. See Fig. 347.

D. caudata Harryana (Harry Veitch's).* This differs from the type in being stouter, of firmer texture, and larger. 1884. Garden variety.

D. Kunthiana is now regarded as a good species, and not as a variety of *D. media*.

D. media Brackenridgei (Brackenridge's). *fronds* firm; pinnæ rather obtuse, fewer and more distant than in the type. *sori* dense, irregularly disposed in two rows. Fiji.

D. m. connexa (connected). *fronds* larger than in the type; pinnæ sometimes 3in. or more in length, much softer and of a more papery texture.

D. m. Milnei (Milne's). *sti.* black, *fronds* firm, parchment-like, dark green; pinnæ sharply toothed, closely set, the central ones often 4in. to 5in. long. *sori* in two rows. Kermadec Islands.

FIG. 348. FERTILE AND BARREN FRONDS OF DOODIA MEDIA.

D. m. Moorei (Moore's). *sti.* black. *fronds* flexible or pendulous; pinnæ very acuminate, sharply toothed, the central ones 3in. long. *sori* in one row. New South Wales.

DOR BEETLE. *See* **Shard-borne Beetle.**

DORCUS PARALLELOPIPEDUS. *See* **Lucanus cervus.**

DORIA (of Adanson). A synonym of **Solidago** (which *see*).

DORIA (of Lessing). Included under **Othonna** (which *see*).

DORITIS (from *doru*, a lance; the labellum in some species is lance-shaped). ORD. *Orchideæ*. A genus embracing five species of stove or greenhouse Orchids, natives of India and Malaya. They have the characters of *Phalænopsis*, but the column is narrowly winged, and its foot forms a conical mentum with the lateral sepals. Two species have been introduced. For culture, *see* **Phalænopsis.**

D. tænialis (band-like). *fl.* mauve-purple, ⅝in. in diameter; mid-lobe of lip dark red or purple, the side lobes very narrow, spathulate, the tips of the forked appendage hooked; scape 1in. to 2in. long, few-flowered. *l.* few, 3in. to 5in. long. Roots 1ft. to 3ft. long, ⅛in. to ¼in. broad, forming large, tortuous tufts. Subtropical Himalayas.

D. Wightii (Wight's). *fl.*, mid lobe of lip obcordate, the side lobes broad, cuneate-obovate; scape much longer. *l.* rather larger. Otherwise like *D. tænialis*. Eastern Himalaya.

DORMANT BUD. A bud which remains, perhaps for years, undeveloped.

DORONICUM. These plants are well suited for naturalising in dry situations, where few other subjects would flourish. To the information given on pp. 486-7, Vol. I., the following should be added:

D. Bourgæi. A synonym of *Senecio multiflorus.*

Doronicum—*continued.*

D. Clusii (Clusius'). A synonym of *Arnica Clusii.*

D. cruentum (bloody). The correct name of *Cineraria cruenta.*

D. montanum (mountain). A synonym of *Arnica montana.*

D. plantagineum excelsum. This is the plant known in gardens as the Harpur Crewe variety.

DORSTENIA. SYNS. *Kosaria, Sychinium.* About forty-five species, all American and African except one (Indian), are included in this genus. Flowers monœcious, crowded on a flat, simple or lobed, androgynous receptacle. Leaves alternate or radical, entire or lobed. To the species described on p. 487, Vol. I., the following should be added:

D. Walleri (Waller's). *fl.*, inflorescence green, star-shaped, nearly 1in. across, with five tails 2in. long. *l.* ovate, fleshy, 2in. to 5in. long. Nyassaland, 1893. A new species, allied to *D. Mannii.*

DORYANTHES. To the species described on pp. 487-8, Vol. I., the following should be added:

D. Guilfoylei (Guilfoyle's). *fl.* crimson, Amaryllis-like, numerous, clustered, borne on a spike 16ft. high. *l.* 9ft. long, 8in. wide. Queensland, 1893. According to Mr. J. G. Baker, this is merely a form of *D. Palmeri.* (Gn., 1893, xliv., p. 69.)

DORYDIUM. A synonym of **Asphodeline** (which *see*).

DORYOPTERIS NOBILIS. A synonym of **Pteris elegans** (which *see*).

DORYPHORA (from *dory*, a spear, and *phoros*, bearing; in allusion to the spear-like appendages to the anthers). SYN. *Learosa.* ORD. *Monimiaceæ.* A monotypic genus. The species is a rare, highly aromatic, warm greenhouse shrub or tree, of considerable size but of irregular growth, glabrous except the inflorescence, or the young shoots hoary-tomentose, the whole plant highly aromatic. It is closely allied to **Atherosperma** (which *see* for culture).

D. Sassafras (Sassafras). *fl.* about ½in. long, hermaphrodite, three together on short, axillary peduncles; perianth segments six, in two rows; connective of the anthers produced into a long, linear-subulate appendage. *l.* petiolate, ovate, elliptic, or oblong-lanceolate, acuminate, narrowed at base, 2in. to 4in. long, coarsely toothed, penniveined and reticulated beneath. New South Wales, 1895.

DORYPHORA DECEMLINEATA, or **COLORADO BEETLE.** *See* **Potato Insect Pests.**

DOT MOTH (*Mamestra persicariæ*). An insect allied to the Cabbage Moth (*Mamestra brassicæ*), quite as common, and a far more general feeder. In fact, there are very few plants found in gardens generally which come amiss to the caterpillars of the Dot Moth. We have found them upon Ferns (*Pteris*), Ivy, Chrysanthemums, Lettuce, Pelargoniums, Gooseberries, and many others. Being of such omnivorous tastes their presence is very unwelcome in gardens.

The Moth is on the wing in June and July, and is nocturnal. In stretch of wings it measures from 1⅝in. to 1⅞in. The fore-wings are dark purplish-brown, approaching black, with numerous small ochreous spots and two blackish-centred kidney-shaped dots (hence the common name). The larvæ vary from dirty green to brown, and have a whitish line on the back, with oblique dark marks on segments five, six, and twelve, and lighter spots on the other segments. They are whitish in the vicinity of the spiracles. They feed in August and September, and then pupate in the earth.

When troublesome upon Gooseberry and other fruit bushes they may be ousted with Paris Green, as they appear after the fruits have been gathered. Where flowering plants are concerned, they should be hand-picked at night by the aid of a lantern when they are feeding. When at rest they are too well protected to be readily seen by either man or birds.

DOUBLE TONGUE. *See* **Ruscus Hypophyllum.**

DOUCIN STOCKS. The Paradise Stock is known as the Doucin, and is largely employed for cordon, bush, or other dwarf form of Apple trees in which the growth is restricted. The French Doucin, or Paradise Stock, is only suitable for pot or other small-growing trees. The English Doucin is a more vigorous, durable, and productive variety, and is superior to the French in every way. The Doucin is both budded and grafted with the Apple, the former mode

Doucin Stocks—*continued.*

finding more favour with nurserymen. The Doucin is increased by suckers or division as well as by root-cuttings. Another excellent mode of propagation is to earth up the plant like Celery, and then cut it up, planting out the rooted pieces.

DOUGLAS FIR BLIGHT (*Sclerotinia Douglasii*). Though the Douglas Fir is oftenest attacked, yet Wellingtonias and other Conifers, mostly in a young state, also suffer. On the Continent the disease is much more in evidence than here. The chief symptoms are the presence of a greyish mould and a withering of the young shoots. Towards the end of summer, Sclerotia, in the form of minute black spots, are formed on the dead shoots, and these bodies are responsible for carrying the fungus over the winter. Conidia are also found upon the fallen needles. Once the disease gets a hold, the trees had better be uprooted and burned. As a preventive measure young stock in the seed-beds and nursery-beds should be sprayed with sulphide of potassium in spring.

DOUGLASIA. One species of this genus is a native of Central Europe; the rest are North American. Flowers axillary or terminating the branchlets, solitary and sessile or pedicellate, sometimes fascicled or umbellate; calyx five-cleft to the middle; corolla salver-shaped, the limb of five imbricated lobes. Leaves imbricated or clustered and spreading, entire. To the species described on p. 488, Vol. I., the following should be added:

D. lævigata (smooth).* *fl.* rose-pink, pedicellate, ¼in. in diameter; corolla-tube twice as long as the calyx, the lobes very broadly obovate; involucral bracts four to six, ¼in. long; peduncle about 1in. long, erect, two- to five-flowered. Spring and autumn. *l.* rosulate, ½in. to ¾in. long, linear or oblong-lanceolate, acute or sub-acute. Alps of Oregon, 1836. Plant tufted. (B. M. 6996.)

DOUMA. A synonym of **Hyphæne** (which *see*).

DOVEDALE MOSS. *See* **Saxifraga hypnoidea.**

DRABA. The species of this genus are very broadly distributed over the cooler parts of the globe. To those described on p. 489, Vol. I., the following should be added:

D. repens (creeping). *fl.* yellow, in loose racemes; petals obovate, obtuse, twice as long as the calyx; scape naked, nearly glabrous. June. *l.* alternate, covered with hairs; lower ones oval-lanceolate or oblong; upper ones linear. Siberia, 1818. A creeping perennial.

D. scabra (rough). *fl.* yellow; petals twice exceeding the calyx and stamens. *l.* linear-lanceolate, acute, glossy green. Juniper-like. Western Caucasus, 1897. A pretty rock-plant.

DRACÆNA. To the species described on pp. 490-1, Vol. I., the following should be added:

D. bicolor (two-coloured).* *fl.* white, tinged with red, in a dense, globose, terminal, shortly pedunculate spike; bracts brown, large. *l.* sub-contiguous, the upper ones slightly ascending, oblong, 4in. to 6in. long, 2in. to 3in. broad, deltoid-cuspidate at apex, narrowed into a petiole 1in. to 3in. long; lower ones oblong-lanceolate, 1ft. to 1½ft. long, 4in. to 5in. broad. Trunk 5ft. high. Fernando Po, &c. (B. M. 5248.)

D. congesta (congested). A synonym of *Cordyline stricta.*

D. Doucetii (Doucet's). A form of *Cordyline australis.*

D. ensifolia (ensate-leaved). A synonym of *D. fruticosa.*

D. floribunda (abundant-flowered). *fl.* greenish, cylindrical, above ¼in. long; panicle drooping, shortly pedunculate, 3ft. to 4ft. long, made up of fifteen to twenty drooping racemes 1ft. or more long. *l.* fifty to sixty, crowded in a dense rosette, lorate, acuminate, 3ft. to 4ft. long, 3in. to 3½in. broad. Trunk 6ft. to 8ft. high. Native country unknown. (B. M. 6447.)

D. fragrans Lindeni (Linden's). *l.* recurved, deep green, with a broad, central, striped variegation of yellow and pale yellowish-green. 1837.

D. f. Massangeana (Massange's). *l.* broadly lanceolate, acuminate, dark green, with a median, whitish stripe. 1883. This variety closely resembles *D. f. Lindeni.* (B. H. 1881, 16.)

D. fruticosa (shrubby). *fl.* white, ¾in. to 1in. long, in an ample, terminal, deltoid panicle. *l.* eighty to 100, sessile, narrow-linear, 1ft. to 1½ft. long, 1in. to 1¼in. broad, acute. Trunk tree-like, often branched. *h.* 10ft. Native country unknown, 1862. SYN. *D. ensifolia* (R. G. 1864, t. 451).

D. Godseffiana (Godseff's).* A prettily-variegated plant, having the general habit of *D. surculosa*, but the spots on the leaves are of a bright creamy-yellow. 1893. (B. M. 7584; R. H. 1893, p. 201.)

D. Hookeriana (Hooker's). *fl.* greenish, about 1in. long; bracts white, persistent; racemes in an erect panicle 1½ft. to 2ft. long. *l.* crowded towards the apex of the stem, sessile, ensiform, 2ft. to

Dracæna—*continued.*

3ft. long, 1in. to 1½in. broad, tapering to a long point, pale green, with a whitish border. South Africa. SYN. *Cordyline Rumphii* (B. M. 4279).

D. H. latifolia (broad-leaved). *l.* 2in. to 3in. broad in the middle, narrowed to the base. (Ref. B., t. 353.)

D. marmorata (marbled). *fl.* greenish-white, less than 1in. long; panicle narrow, erect, 1½ft. to 2ft. long. Spring. *l.* crowded, sessile, lanceolate, recurved, plicate, bright green, copiously marbled with white, 3ft. long, 4in. broad. Singapore, 1882. Allied to *D. arborea.* (B. M. 7078.)

D. salicifolia (Willow-leaved). A synonym of *D. reflexa.*

D. Sanderiana (Sander's).* *l.* narrow-lanceolate, sheathing at base, 6in. long, 1½in. broad, elegantly curved, green, banded with white. Stem slender, branched at base. Western tropical Africa, 1892. A distinct and ornamental species. (G. C. 1893, xiii., p. 442, f. 65; J. H. xxvi., p. 339, f. 71.)

D. sepiaria (hedge-loving). A form of *Cordyline terminalis.*

D. stricta (erect). A synonym of *Cordyline stricta.*

In addition to the above, the following garden forms may be enumerated: *cristula, Laingii, mirabilis, Ponbellei* (R. H. 1888, p. 530), *Thomsoniana.*

DRACÆNOPSIS. Included under **Cordyline** (which *see*).

DRACOCEPHALUM. To the species described on p. 491, Vol. I., the following should be added. A few plants formerly classed hereunder are now referred to **Cedronella, Lallemantia,** and **Physostegia.**

D. chamædryoides (Chamædrys-like). A synonym of *Sphacele campanulata.*

D. imberbe (beardless). *fl.*, corolla lilac-blue, 1in. long, the lips nearly equal; bracts cuneate, cut, glabrous. *l.*, radical ones long-petiolate; cauline ones few, shortly petiolate, all reniform, deeply crenate. Floriferous branches erect. *h.* 6in. Siberia, 1823. (R. G. 1080, f. 4-5.)

DRACONTIUM. Bentham and Hooker include hereunder *Echidnium* (kept distinct on pp. 493-9, Vol. I.) and *Godwinia.* To the species described on pp. 491-2, Vol. I., the following should be added:

D. fœcundum (fertile). *fl.*, spathe dull brown outside, dark vinous-purple within, 5in. high, erect, narrowly cylindric-oblong; spadix bluish-brown, 1¾in. high, sub-sessile, erect, cylindric, obtuse. March. *l.* solitary, produced after the flower, 4ft. to 5ft. in diameter, horizontal, tripartite, each segment bearing several pairs of drooping leaflets; petiole 6ft. high. Tubers surrounded by a profusion of acute bulbils, rising above the ground. British Guiana, 1880. (B. M. 6803.)

D. spinosum (spiny). A synonym of *Lasia heterophylla.*

DRAGONFLIES (*Odonata*). Very beautiful insects, varying greatly in size and colouring, but usually brilliant. As perfect insects they "hawk" for their prey upon the wing, and the larger species, at any rate, render good service to the gardener by destroying many objectionable Moths and Butterflies. Though usually found near water—lakes, ponds, rivers, &c.—the larger Dragonflies venture long distances therefrom. So swift are they upon the wing that their movements are not readily noted when they are food-foraging. Indeed, it is not until we see the cast-off wings, maybe, of a captured Butterfly as they descend that we realise what has happened. The indigestible portions of the prey are apparently dropped by the Dragonfly. It is only in the perfect insect stage that Dragonflies are usually seen; the remainder of their lives is passed in the water.

DRAGON, GREEN. *See* **Arum Dracontium** (the correct name of which is now *Arisæma Dracontium*).

DRAKÆA. SYN. *Arthrochilus.* The species of this genus are rarely met with in cultivation.

DRAPERIA (named in honour of Professor John William Draper, of New York, chemist and historian). ORD. *Hydrophyllaceæ.* A monotypic genus. The species is a low and diffuse or decumbent, half-hardy, silky-hairy, perennial herb, branching from a slightly woody base, allied to *Phacelia.* It thrives in ordinary soil, in a shady position, with protection in winter, and may be increased by divisions.

D. systyla (columned). *fl.* crowded in a pedunculate, terminal cyme; corolla bright violet, ¾in. to ¼in. long; spikes or racemes unilateral. *l.* all opposite, ovate, entire, pinnately veined; petioles slender. California, 1896.

DRAPIEZA. A synonym of **Disporum** (which *see*).

DREGERA. A misprint in some books for *Drejera*, which is included under **Jacobinia.**

DREJERA. Included under **Jacobinia** (which *see*), the correct name of *D. Willdenowiana* being *J. Mohintli.*

DREPANIA. A synonym of **Tolpis** (which *see*).

FIG. 349. DRYMOGLOSSUM CARNOSUM.

DREPANOCARPUS. *Sommerfeldtia* is identical with this genus.

DRIAS-PLANT. *See* **Thapsia garganica.**

DRIMIA. *D. Colex* (B. M. 7565) is a recent introduction, with small greenish perianth segments and purple anthers; it is of no great horticultural merit.

D. altissima (very tall). A synonym of *Urginea altissima.*

DRIMIOPSIS. This genus is very closely allied to *Scilla. C. botryoides, C. minor,* and *C. perfoliata* have been introduced, but they are of no horticultural value.

DROSERA. To the species described on p. 494, Vol. I., the following should be added:

D. anglica (English). *fl.* larger. *l.* still longer and narrower, often 1in. long without the stalk. Otherwise like *D. longifolia.* Europe (Britain).

D. anglica (of De Candolle). A synonym of *D. longifolia.*

D. cistiflora (Cistus-flowered). *fl.* Poppy-red, violet, or white; nearly 2in. across, one to three at the end of the stem; petals cuneate-obovate, the outer margin erose, rounded, truncate, or retuse. *l.* 2in. to 4in. long, ⅛in. broad, clothed with glandular hairs. Stems 6in. to 12in. high, slender. South Africa, 1839. (B. M. 7100.)

D. intermedia (intermediate). A synonym of *D. longifolia.*

D. linearis (narrow). Slender Sundew. *fl.* white or purple. July. *l.* linear, obtuse, 2in. to 3in. long, scarcely ⅛in. wide, on naked, erect petioles about the same length. North America, 1818. Plant stemless, hardy.

D. longifolia (long-leaved). *fl.*, stem shorter and less slender. *l.* much more erect, not half so broad as long, gradually tapering into the footstalk. Otherwise like *D. rotundifolia.* Europe (Britain). SYNS. *D. anglica* (of De Candolle), *D. intermedia.*

D. tenuifolia (slender-leaved). A synonym of *D. filiformis.*

DRYANDRA. SYN. *Josephia.* Fruit a compressed capsule opening at the dilated end (or outer margin) in two coriaceous or rarely almost woody, broad valves.

DRYAS. To the species described on p. 495, Vol. I., the following variety should be added:

D. lanata (woolly). This is a Tyrolean form of *D. octopetala,* having woolly leaves. July. 1891.

DRYMOGLOSSUM. These Ferns are of easy culture in a mixture of two parts leaf-mould, one of sphagnum, and one of peat, with a dash of silver-sand, and some species will grow luxuriantly on cork for several years. The slender rhizomes firmly adhere to that material, especially when it is so situated as to remain permanently moist. The plants are particularly fond of strong light, but moisture on their fronds is detrimental. Propagation is usually effected by the division of the rhizomes. *D. carnosum* (Fig. 349) and *D. piloselloides* (Fig. 350) are the principal species. The latter is very effective when grown upon a piece of Dead Tree-Fern.

FIG. 350. DRYMOGLOSSUM PILOSELLOIDES.

DRYMONIA. To the information given on p. 495, Vol. I., the following should be added:

D. punctata is now classed under *Episcia.*

D. serrulata (slightly serrated). The correct name of *D. bicolor.*

D. villosa (villous). A synonym of *Episcia villosa.*

DRYMOPHLŒUS. Fruit small or rather large. To the information given on p. 495, Vol. I., the following should be added:

D. appendiculatus (appendiculate). *fl.*, scapes lateral. This is the correct name of the Palm described on p. 495, Vol. I., as *D. olivæformis* (G. & F. 1891, p. 330, f. 37). The plant matures fruit annually under cultivation at Kew. (B. M. 7202.)

D. leprosus (leprous). The correct name of *D. olivæformis.* SYN. *D. Rumphii.*

D. Rumphii (Rumphius'). A synonym of *D. leprosus.*

D. singaporensis (Singapore). A synonym of *Ptychoraphis singaporensis.*

DRYOBALANOPS. *D. Camphora* is a synonym of *D. aromatica.*

DRYOPEIA. A synonym of **Disperis** (which *see*).

DRYOPHANTA FOLII. *See* **Oak Galls.**

DUANIA. A synonym of **Homalanthus** (which *see*).

DUBBING. A name sometimes employed for clipping or trimming hedges.

DUCHEKIA. A synonym of **Palisota** (which *see*).

DUCHOLA. A synonym of **Omphalea** (which *see*).

DUHAMELIA. A synonym of **Hamelia** (which *see*).

DULIA. A synonym of **Ledum** (which *see*).

DUMERILIA (of Lagasca). A synonym of **Jungia** (which *see*).

DUMOSE, DUMOUS. Having a compact, bushy habit.

DUNG-LOVING EARTH-DIGGER, or **DUNG-BEETLE.** *See* **Shard-borne Beetle.**

DUPERRYA. A synonym of **Porana** (which *see*).

DURANTA. Flowers rather small, alternate at the sides of the rachis; calyx tubular or sub-campanulate; corolla tube cylindrical, the limb spreading, five-lobed. Leaves opposite or whorled, entire or toothed. Drupe wholly included by the calyx, four-stoned. To the species described on p. 496, Vol. I., the following should be added:

D. Plumieri alba (white). A variety having white flowers and amber-coloured fruit. 1883. (G. C. 1883, iii., p. 45, f. 9.)

D. stenostachya has also been introduced.

DURETIA. A synonym of **Bœhmeria** (which *see*).

DURIAN. This, the fruit of *Durio zibethinus*, has not found its way into British markets in any very large quantities—due in a measure to the difficulties attending its preservation; it is nevertheless quite familiar to those Europeans who have travelled in tropical regions, in Malayan districts, or along the Bay of Bengal. It is oval

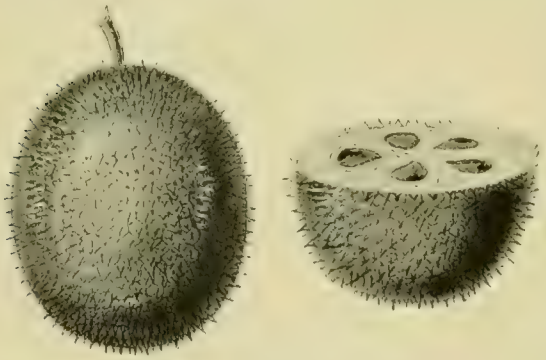


FIG. 351. DURIAN (DURIO ZIBETHINUS).

or globular in form (see Fig. 351), larger than a cocoa-nut, and attains some 8in. or 10in. in length. It has a hard prickly shell outside, and contains inside a soft creamy pulp and seeds. The pulp is considered to be by many the most delicious fruit in the world, but the smell

Durian—*continued.*

of it is most offensive, resembling, according to some experiences, that of rotting onions. The seeds are roasted and eaten like chestnuts. When unripe, the fruit may be salted and added to pickles; but the strong smell is against its use as a pickle in civilised countries.

DUVALIA. There are about ten species of this genus. To those described on p. 496, Vol. I., the following should be added:

D. angustiloba (narrow-lobed). *fl.*, corolla chocolate-brown, ¾in. to 1in. in diameter, the lobes narrow-lanceolate, acuminate, folded back into thin, vertical plates; corona white; cymes stout, five- to twenty- or more-flowered. Stems sub-globose or oblong, ½in. to 1in. long, ½in. to ¾in. thick, obtusely four- or rarely five-angled. 1875.

DUVERNOIA. A synonym of **Adhatoda** (which *see*).

DWARF PALMETTO. *See* **Sabal Adansonii.**

DWARF RASPBERRY. *See* **Rubus triflorus.**

DYCKIA. Including *Encholirion* (in part). According to J. G. Baker, this genus embraces upwards of thirty species, natives of Brazil, Uruguay, and Argentina. Flowers usually yellow, hermaphrodite; sepals free to the base; petals usually lingulate-unguiculate; stamens hypogynous or three adnate to the base of the petals; inflorescence spicate, racemose, or paniculate; peduncle produced from the axil of one of the outer leaves of the basal rosette. Fruit a hard, three-angled capsule. Leaves very thick and rigid, margined with pungent spines. To the species described on p. 497, Vol. I., the following should be added:

D. altissima (highest). *fl.* in an ample panicle, with sometimes ten to twelve branches, the lower ones 1ft. long; petals bright yellow, twice as long as the calyx; peduncle stout, not longer than the leaves. *l.* sometimes 100 in a dense rosette, ensiform, acuminate, 1½ft. long, 1in. broad, armed with copious pungent, brown spines. Central Brazil, 1840. SYNS. *D. princeps* (L. J. F. 224-5), *D. gigantea*, *D. laxiflora*, and *D. ramosa* (of gardens).

D. Desmetiana (De Smet's). *fl.* disposed in a branched panicle 2ft. long; petals red, ½in. long; peduncle 2ft. long. *l.* ensiform, thick, recurved, 2ft. long, armed with marginal prickles. Brazil, 1894. (B. M. 7340.)

D. gemellaria (twin). A garden synonym of *D. sulphurea.*

D. gigantea (gigantic). A garden synonym of *D. altissima.*

D. laxiflora (lax-flowered). A garden synonym of *D. altissima.*

D. Lemaireana (Lemaire's). Probably a form of *D. rariflora.*

D. leptostachya (slender-spiked). *fl.* twenty to twenty-five in a simple, erect spike 6in. to 9in. long; sepals reddish, densely pruinose; corolla bright scarlet, ¾in. long, the petals ½in. broad; peduncle slender, 3ft. long. Summer. *l.* fifteen to eighteen in a dense, nearly sessile rosette, lanceolate, acuminate, falcate, rigid, 1½ft. to 1¾ft. long, 1in. to 1½in. broad, semi-circular at back, the marginal prickles brown. Paraguay, 1867.

D. princeps (first). A synonym of *D. altissima.*

D. ramosa (branched). A garden synonym of *D. altissima.*

D. rariflora remotiflora (remote-flowered). *fl.*, petals twice as long as the calyx (being ¾in. long), the blade obovate-spathulate. (B. M. 3349 and B. R. 1782, under name of *D. rariflora.*) *D. Lemaireana* is probably another form of *rariflora.*

D. regalis (regal). A synonym of *D. frigida.*

D. sulphurea (sulphur-coloured). *fl.* ascending, in a lax, simple spike 1½ft. long; petals pale sulphur-yellow, half as long again as the calyx; peduncle 1ft. or more in length. *l.* thirty to forty in a dense rosette, 4ft. to 5ft. long, ¾in. to 1in. broad, gradually narrowed to a pungent tip, the marginal prickles minute. Montevideo, 1873. SYN. *D. gemellaria* (of gardens). Probably only a pale-flowered variety of *D. brevifolia.*

DYSODIA [also spelt *Dyssodia*]. **Bœbera,** which has been kept distinct in this work, is included hereunder by the authors of the "Genera Plantarum."

DYSOPHYLLA (from *dusodes*, fœtid, and *phyllon*, a leaf; in allusion to the pungent, Peppermint-like odour given off by the leaves). SYN. *Chotekia.* ORD. *Labiatæ.* A genus comprising about twelve species of stove or greenhouse herbs, natives of tropical Asia and Australia. Flowers minute, in dense spikes formed of many cymes. Leaves opposite or whorled. A few of the species have been introduced, but they are of little horticultural value.

DYSSOCHROMA (from *dysoos*, sickly, and *chroma*, colour; in allusion to the lurid, sickly colour of the flowers). ORD. *Solanaceæ.* A small genus (two species) of stove, climbing sub-shrubs or small trees, natives of Brazil. Flowers greenish-yellow, large, pendulous; calyx ample,

Dyssochroma—*continued.*

five-cleft; corolla funnel-shaped, swollen or campanulate above, the limb plicate, deeply five-lobed; stamens five; pedicels often solitary, terminating the short, nodose branchlets. Leaves entire, membranous or coriaceous. For culture, *see* **Solandra.**

D. eximia (choice). The correct name of *Juanulloa eximia.*

D. viridiflora (green-flowered). The correct name of *Solandra viridiflora.*

DYSSODIA. *See* **Dysodia.**

EAGLE FERN. *See* **Pteris aquilina.**

EAGLE-WOOD. *See* **Aquilaria.**

EARLIA. A synonym of **Graptophyllum** (which *see*), the correct name of *E. excelsa* being *G. Earlii.*

EARWIGS. *Forficula auricularia* is the species usually found in gardens in a very large number of flowering plants, as well as certain fruit-trees—Apples, Nectarines, and wall-fruits generally—and Hops. In some gardens, too, *Labia minor* may frequently be found in abundance. Like *F. auricularia*, the latter insect is a winged Earwig, but unlike that species it may be often seen upon the wing. Very occasionally another British species, *F. lesnei*, a pale-coloured insect, may be found, though not in gardens, so far as we have any record: it is a very good example of the wingless species. Popularly, we think that the Earwigs are often accredited with damage that they do not inflict. Those who have kept the insects in captivity all say that they show a marked fondness for a carnivorous dietary, house-flies in particular. That *F. auricularia*, as suggested above, is found on a variety of plants is certain, but it by no means follows that it derives its entire sustenance from either the fruit or the flowers in which it elects to conceal itself. According to Ruhl, an eminent authority, the Earwig prefers larvæ and even snails to fruit, only taking to a vegetarian dietary when the carnivorous one fails.

Besides the British species of Earwigs, *F. auricularia* and *L. minor*, already named as being plentiful in gardens, we have records of an illustrious foreigner being found at Kew Gardens, having been imported in Sugar Cane from the Mauritius. Scientifically this is known as *Chelisoches morio.* It is thus described by Mr. Lucas in the "Entomologist" for March, 1898: "In colour it is shining black, with fully-developed wing-cases and wings. The antennæ are of about seventeen joints, and black in colour except two joints near the tip. The legs are black, with the exception of the tarsi, which are pale yellowish-brown, and of which the second joint is extended as a lobe below the third. The male forceps are short, especially at the base. Those of the female are long and pointed. In length it is rather more than ¾in."

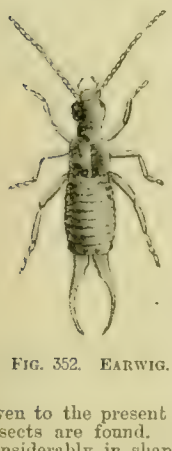


FIG. 352. EARWIG.

Traps. From the fondness Earwigs have of hiding in the daytime in practically anything likely to afford a little shelter, they are comparatively easy to trap. Many of these are described in Vol. I., p. 497. To these may be added hollow stalks (such as those of Hemlock), rolls of crumpled paper, and old hats containing a little hay, and placed upon the stakes supporting plants like Dahlias, &c.

The name Earwig has been bestowed upon these insects because of a popular superstition existing that the insects enter the ear and penetrate the brain, causing death. Even to the present day this is believed in wherever the insects are found. The forceps found on Earwigs vary considerably in shape and size. They attain their most formidable proportions in the males (see Fig. 352). Besides being employed in the case of the winged kinds in packing away the delicate wings, they are also used as weapons of offence, but are incapable of inflicting any harm.

EAST INDIAN HAWTHORN. *See* **Rhaphiolepis indica.**

EAST INDIAN WINE PALM. *See* **Phœnix sylvestris.**

EBENEOUS. Ebony-black.

EBERMAIERA. About forty species of this genus are now known. Flowers solitary at the axils of the bracts, sessile or shortly pedicellate; spikes or racemes terminal or quasi-axillary, simple or compound; sepals and corolla lobes five each; stamens four, didynamous. Leaves nearly always opposite.

EBURNEOUS. Ivory-white.

ECCREMOCARPUS. Including *Calampelis.* Four species are now included in this genus. To those described on p. 498, Vol. I., the following variety should be added:

E. scaber roseus (rosy). A variety with orange-red flowers. 1891.

ECHEANDRA (derivation unknown). ORD. *Liliaceæ.* A genus consisting of only a couple of species of stove, bulbous plants, only differing from *Anthericum* in the anthers. Both have been introduced, but they have little horticultural value. *E. eleutherandra* is in the Kew Collection.

ECHIDNOPSIS. To the species described on p. 499, Vol. I., the following should be added:

E. Dammanniana (Dammann's). This is very similar to *E. cereiformis* (of which it is probably only a variety), but has brown flowers. Abyssinia, 1892. (R. G. 1892, p. 526, f. 107.)

ECHINACEA. According to the latest authorities this genus is now kept distinct from *Rudbeckia. E. purpurea* is shown on p. 332, Vol. III. (Fig. 398).

ECHINOCACTUS. Bentham and Hooker include **Malacocarpus** (of Salm-Dyck) (which *see*) under this genus. Upwards of 200 species have been described, but the number may be considerably reduced.

The soil for Echinocactuses should be similar to that recommended for Cereuses, as also should be the treatment as regards sunlight and rest. It cannot be too clearly understood that during the period between October and March these plants should be kept perfectly dry at the root, and in a dry house, where the temperature would not fall below 50deg. There is no occasion for repotting the Echinocactuses every year; it is far safer to allow them to remain in the same pots severa years, should the soil be fresh and the drainage perfect.

All the larger-stemmed kinds may be kept in health when grown on their own roots; but for some of the smaller species it is a good plan to graft them upon the stem of some of the Cereuses—*C. tortuosus* or *C. colubrinus* being recommended for the smaller kinds, and for the larger *C. peruvianus, C. gemmatus*, or any one the stem of which is robust and of the right dimensions to bear the species of Echinocactus intended to be grafted. Some growers prefer to graft all the small Echinocactuses upon other kinds, and when properly grafted they are safer thus treated than if grown on their roots. In grafting, the two stems (stock and scion) must be so cut that their edges meet, and in securing them two or three stakes must be placed in such a way as to afford support to the graft and hold it firmly in position.

Besides grafting, cuttings of the stems may be utilised for the multiplication of Echinocactuses, first removing the upper portion of the stem and putting it into soil to root, and, afterwards, as lateral stems develop on the old stock, they may be cut away with a sharp knife, and treated in a similar manner. Should a plant become sickly, and look shrivelled and cankered at the base, it is always best to cut away the healthy part of the stem, and induce it to form fresh roots, thus giving it a new lease of life. Seeds of these plants may be obtained from dealers, more especially Continental nurserymen. They should be sown in soil, and kept moist and warm. In about a month after sowing, the little Pea-like, green balls will be seen pushing their way through the thin covering of soil, and gradually but slowly increasing in size, their spines also increasing in number and strength, the ridges forming according to the character of the species, till, finally, they assume the mature characters of the plant in both stem and habit. The flowers, of course, appear according to the length of time it takes for the species to grow to flowering size.

Echinocactus—*continued.*

To the species described on pp. 499-501, Vol. I., the following should be added:

E. aureus (golden). A synonym of *E. Grusoni.*

E. bolansis (Bolanas). *fl.* bright red, terminal, 2in. wide. Stem cylindrical, 16in. high, 4in. in diameter, with from eight to thirteen ribs, disposed more or less spirally; spine tufts crowded, composed of about twenty radials, which are white, straight, and about 1in. long, and four central ones, also straight, and 1½in. long. Bolanas, Mexico, 1889. (R. G. 1889, p. 106, f. 21.)

E. brevihamatus (short-hooked). *fl.* pink, shaded with deep rose, 1in. long, borne in clusters at the top of the stem. Summer. Stem almost spherical, 4in. to 6in. high; ridges tubercled, about ½in. deep, each tubercle bearing a tuft of about a dozen brown, radiating spines, the long central one hooked at the point. South Brazil, 1850. A very slow grower; it should be grafted on another kind.

E. cinnabarinus (cinnabar-red). A synonym of *Echinopsis cinnabarina.*

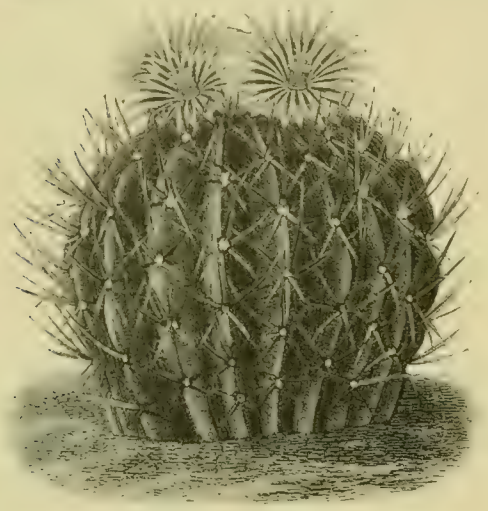


FIG. 353. ECHINOCACTUS COPTONOGONUS.

E. coptonogonus (wavy-ribbed).* *fl.* 2in. across, Daisy-like, with a very short tube; sepals and petals white, with a purple, central stripe; stamens red, with yellow anthers. April and May. Stem globose, depressed at top; ribs ten to fourteen, strong, sharp-edged, wavy, with spine tufts set in little depressions along the margins; spines five to a tuft, the two upper ones 1in. long, quadrangular, the two lower ones shorter, flattened, the central one longest. Mexico. See Fig. 353. SYN. *E. interruptus.*

FIG. 354. UPPER PORTION OF PLANT OF ECHINOCACTUS CORNIGERUS.

E. cornigerus (horn-bearing). *fl.* small; sepals brownish-red; petals purple, narrow. Stem spherical, greyish-green; ribs fourteen to twenty-one, stout, wavy; spines in tufts about 2in. apart, stouter than in any other species, the three erect, horn-like ones yellow, the broad, tongue-like one purple, very strong. Mexico and Guatemala. Probably not yet cultivated in England. See Fig. 354. SYNS. *E. latispinus* (of gardens), *Melocactus latispinus.*

E. cylindraceus (cylindrical). *fl.* yellow, 2in. long, a dozen together on old plants. Stem 6in. high; ribs about twenty; spines stout, strong, the longest 3in. long, hooked, projecting outwards, the shorter ones spreading and interlacing so as to form a sort of spiny network all round the stem. Colorado, 1877.

E. Digueti (Diguet's). *fl.* yellow; petals long, lanceolate; sepals red or brown, very short. Stem narrowly ribbed, compressed, concave at apex; spines in groups of six or seven, 1in. to 1½in. long, needle-like. *h.* 9ft. to 12ft. Lower California. A giant species.

E. durangensis (Durango). *fl.* of a brownish-red. Stem ovate-cylindrical, 3in. to 10in. high, having about a score of continuous ribs, bearing tufts of stout, yellowish and brown spines 1in. to 2in. long, the lowest ones the stoutest and hooked, the central ones angled. Mexico, 1890. This is perhaps a form of *E. cylindraceus.*

E. Echidne (viper). *fl.* bright yellow, with whitish stamens, borne near the centre of the top of the stem. Summer. Stem stout, cylindrical, 1ft. high, 8in. in diameter, with about a dozen deep, spiral ridges; spines rigid, broad, 1in. or more in length, spreading and interlacing all round the stem. Mexico. This will thrive in a house from which frost is excluded, but it rarely flowers.

FIG. 355. PORTION OF RIB, WITH FLOWER AND BUNDLE OF SPINES, OF ECHINOCACTUS EMORYI.

E. Emoryi (Emory's). *fl.* 3in. long; petals red, with yellowish margins, spreading; stamens deep yellow; tube clothed with kidney-shaped scales or sepals. Autumn. Stem globose, 1ft. to 2ft. in diameter; ribs about thirteen, with large, rounded tubercles; spines in star-shaped bundles of eight or nine at the apices of the tubercles, angled, articulated, 1in. to 4in. long, with hooked points. Lower Colorado and California. See Fig. 355.

E. equitans (equitant). A synonym of *E. horizonthalonius.*

E. erinaceus (hedgehog-like). The correct name of *Malacocarpus erinaceus.*

E. glaucus (glaucous). *fl.* rose-coloured, large and handsome. Mountains of Colorado, 1894. A small, hardy species.

E. Grusoni (Gruson's). *fl.* red and yellow. Stem globose, stout, 6in. or more in height; ribs about twenty, almost hidden by the crowded clusters of stout, bright yellow, more or less curved spines 1in. to 2in. long. 1895. See Fig. 356. SYN. *E. aureus.*

E. Haselbergii (Haselberg's).* *fl.* ochreous-yellow and red, 1in. to 1½in. in diameter, sessile, broadly campanulate, with a short, red, spiny tube; segments about forty. April. Stem globose or oblate, 3in. in diameter; tubercles small, convex, appearing almost vertically disposed in innumerable parallel series, but really spirally arranged, convex, crowned with a tuft of white hairs; spines twenty to a tuft, silvery, acicular, ¼in. long, stellately spreading. Native country unknown. (B. M. 7009.)

E. horizontalis (horizontal). A synonym of *E. horizonthalonius.*

E. horizonthalonius (spreading-spined). *fl.* terminal, 4in. across, scented, cup-shaped, springing from the young spine tufts; petals in two rows, deep rose, paler on the inside; stamens with white filaments and yellow anthers. May and June. Stem

Echinocactus—*continued.*

globose, usually flattened at top; ribs or ridges eight or nine, large, greyish-green; spines in crowded, star-like clusters along the edges of the ribs, strong, slightly curved, horn-like, marked with numerous rings. Mexico. See Fig. 357. SYNS. *E. equitans*, *E. horizontalis*.

FIG. 356. ECHINOCACTUS GRUSONI.

E. ingens (huge). The correct name of *E. Visnaga*.

E. interruptus (interrupted). A synonym of *E. coptonogonus*.

E. Joadii (Joad's).* *fl.* bright yellow, handsome, 2in. in diameter; calyx tube furnished with tufts of slender spines, mixed with curly hairs; petals numerous, narrow-oblong, acute; stigmas crimson. Stem globose, many-ribbed; spines brownish, the outer ones fifteen to eighteen, radiating, the inner ones six or seven, longer and stouter, directed outwards. Uruguay (?) 1885. (B. M. 6867.)

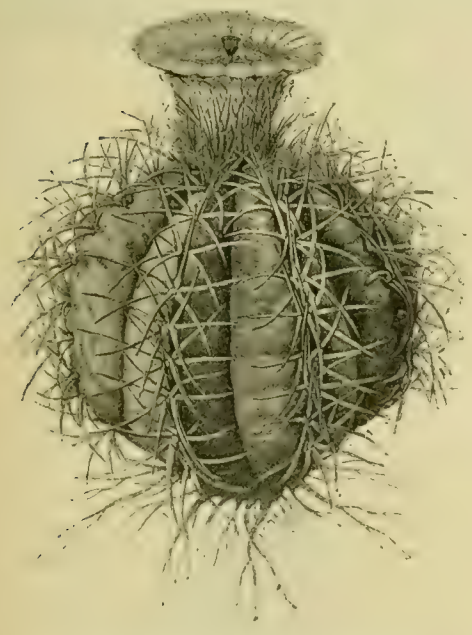


FIG. 357. ECHINOCACTUS HORIZONTHALONIUS.

E. Johnsoni (Johnson's). *fl.* purple or pink, 2in. to 2½in. long and wide, with numerous reniform sepals on the ovary and tube;

Echinocactus—*continued.*

petals ovate, obtuse. Stem medium-sized, 4in. to 6in. high, with seventeen to twenty-one low, rounded, interrupted, close-set, often oblique ribs, densely covered with stoutish, reddish-grey spines, the outer ten to fourteen ½in. to 1½in. long, the upper longest; the central four stouter, recurved, 1½in. long. Southern Utah. (R. G. 1883, p. 58.)

E. latispinus (broad-spined). A garden synonym of *E. cornigerus*.

E. Leeanus (Lee's). *fl.* white, tipped with rose, 1½in. long and wide; stamens pale yellow. May. Stem the size of a small orange, with plump, globose tubercles, bearing star-shaped clusters of short, brown spines. Argentine Republic, 1840. (B. M. 4184.)

E. Mackieanus (Mackie's). *fl.* two or three at the top of the stem, 2½in. across; petals white, tipped with brown. Stem 5in. high, 2in. broad at base, widening slightly upwards; ridges broken into numerous fleshy, rounded, green tubercles, crowned with a tuft of thin brown spines, ½in. to 1in. long, set in small pads of yellow wool. Chilian Andes, 1837.

E. mammillarioides (Mammillaria-like). A synonym of *E. Pfeifferi*.

E. mamulosus (small-nippled). *fl.* about 4in. across, with a thick tube, borne at the top of the stem; petals bright yellow, spreading; stamens purple. June. Stem short, with numerous tubercled ridges, bearing bunches of dark brown, hair-like spines forming a close network. Probably Brazil.

E. Mirbelii (Mirbel's). A synonym of *E. ornatus*.

E. Odieri Mebbesii (Mebbes'). This variety differs from the type in having flesh-coloured flowers.

E. Orcutti (C. R. Orcutt's).* *fl.* deep crimson, bordered with greenish-yellow, borne in a ring near the apex of the stem. *fr.* green, globose. Stems cylindrical, 2ft. to 3ft. high, 1ft. in diameter, single or in clusters; ribs eighteen to twenty-two, often oblique; spines in clusters of about a dozen, equal. Lower California. There is a form with lemon-yellow flowers and recurving white spines.

FIG. 358. PORTION OF RIDGE, WITH SPINES, OF ECHINOCACTUS POLYCEPHALUS.

E. ornatus (ornate). *fl.* yellow; sepals subulate. Summer. Stem oblong or sub-globose, eight-angled, of a pleasing green with brown spots; ribs compressed, spirally twisted; tubercles white-woolly; prickles in groups of seven to ten, pale yellow. Mexico, 1838. SYNS. *E. Mirbelii*, *E. tortus*.

E. pectinatus (comb-like). A synonym of *Cereus pectinatus*. *E. pectiniferus* is a distinct species.

E. peninsulæ (peninsular). *fl.* varying from golden-yellow to red. Stem globose to cylindrical, 6in. to 5ft. high, 6in. to 14in. in diameter; ribs about twenty-one, straight or rarely oblique; spines red, the radials about eleven, robust, 1in. long, the four centrals stouter, 2in. long. Lower California. Allied to *E. Emoryi*.

E. Pentlandi is now classed under *Echinopsis*.

E. Pfeifferi (Pfeiffer's). *fl.* bright yellow, with a band of red down the centre of each petal, 2in. long, short-tubed; stamens yellow. Stems very irregular in form owing to the crowding

Echinocactus—*continued.*

of the tubercles, which look as if filled with water; spines small, in tufts of six, set in yellowish wool. Chili. SYN. *E. mammillarioides* (B. M. 3558).

E. polyancistrus (many-hooked). *fl.* red or yellow, 2½in. long and wide. Stem light green, ovate or cylindrical, 4in. to 10in. high, 3in. in diameter; ribs thirteen to seventeen, interrupted, bearing tufts of about twenty radial spines 1in. to 2in. long, and about a dozen central ones 1in. to 4in. long, most of them sharply hooked and dark brown. California.

E. polycephalus (many-headed). *fl.* enveloped at base in a dense mass of white wool, which hides the tube; petals bright yellow, 1in. long, spreading like a saucer; stamens yellow, numerous. Spring. Stems numerous in old plants, the largest 1½ft. to 2½ft. high, cylindrical, globose when young; ribs twelve to twenty, sharply defined; spines in clusters 1in. apart, reddish, broad, flattened on the upper side, annulated, the central ones over 3in. long in old plants, and sometimes curved. California and Colorado, 1886. Warm house. See Fig. 358.

FIG. 359. ECHINOCACTUS POTTSII.

E. Pottsii (Potts'). *fl.* yellow, about 2in. across, short-tubed, several expanding together on the top of the stem. Summer. Stems globular, 1½ft. in diameter; ridges about a dozen, rounded and even, with acute sinuses; spines 1in. long, bristle-like, arranged in clusters of seven or nine, with a cushion of white wool at the base. California, 1840. Warm house. See Fig. 359.

E. rosaceus (rosy). A synonym of *E. corynodes.*

E. Schilinzkyanus (Schilinzky's). *fl.* small, apical. Stem globose or shortly cylindrical, 2in. or less in height; ribs separated into compressed tubercles as in some Mammillarias, each bearing a tuft of twelve to fifteen very short, thin, black, hooked spines. Paraguay, 1897. This may be a Mammillaria.

E. Scopa cristatus (crested). A curious monstrosity, owing its origin to fasciation, such as occurs in the Cockscombs, Echeverias, &c. The plant shown at Fig. 360 is grafted on the stem of a Cereus.

E. Sellowianus (Sellow's). A synonym of *E. corynodes.*

E. senilis (old). *fl.* light pink, 1½in. long, 1in. in diameter, having a scaly, cylindrical tube. Stem stout, cylindric, with sixteen or eighteen ribs, having tufts of numerous hair-like spines, curving upwards. Chili, 1886. (R. G. 1230A.)

E. sinuatus (sinuated). *fl.* yellow, 3in. across, borne at the top of the stem. April. Stem globose, 8in. in diameter; ridges fourteen to sixteen, wavy or undulated, the prominent point crowned with tufts of thin, flexuous, yellow spines, the longest 1½in. and hooked, the shorter ¾in. and straight. Mexico.

E. spiralis (spiral). *fl.* unknown in cultivation. Stem subglobose or oblong, glaucescent, thirteen-angled; areolæ remote, velvety; prickles in groups of seven or eight outer spreading ones and a more robust, flat, central one, hooked at apex. Mexico, 1838. (R. H. 1889, p. 569.)

E. tenuispinus (slender-spined). This species is to all appearance identical with *E. Ottonis*, the distinction being purely botanical. Mexico. (B. M. 3963.)

E. tortus (twisted). A synonym of *E. ornatus.*

E. turbiniformis (top-like). *fl.* 2½in. across; tube woolly; petals pink, fringed. Stem short, with a thick, coriaceous skin, ridges broad at base, irregular, crowned with tufts of stout, horny spines, the central one much the longest, flattened at base, and extremely strong. North-east Mexico.

Echinocactus—*continued.*

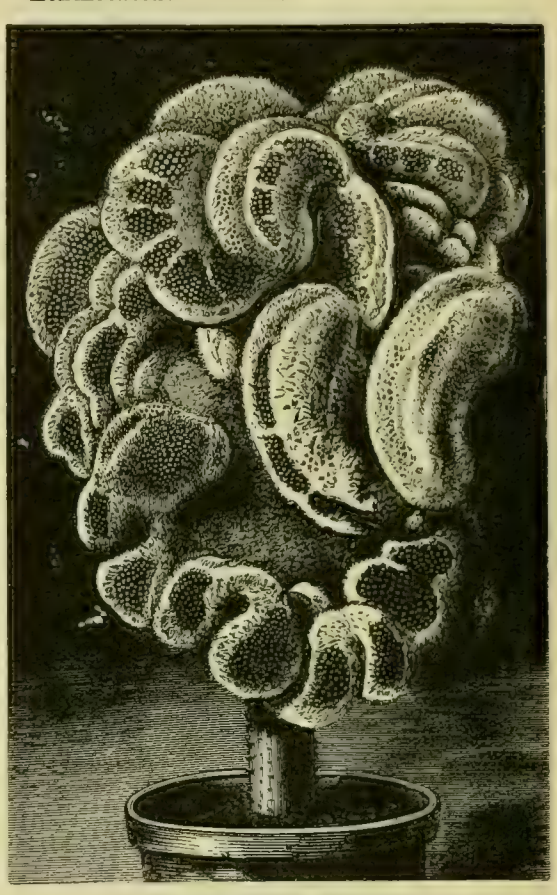


FIG. 360. ECHINOCACTUS SCOPA CRISTATUS.

E. uncinatus (hooked). *fl.* clustered at the apex, nearly 2in. long; petals dark purplish-red, acuminate; stamens yellow. March and April. Stem 6in. high; ridges broken into long tubercles, upon each of which is a tuft of short, straight spines arranged in a circle, with a central hooked one sometimes 4in. long. Mexico. See Fig. 361.

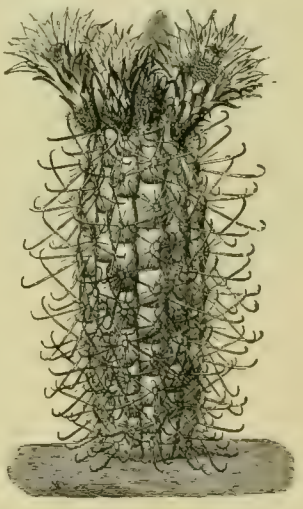


FIG. 361. ECHINOCACTUS UNCINATUS.

Echinocactus—*continued.*

E. viridescens (greenish). *fl.* yellowish-green, rather large, produced from the upper clusters of spines. Stems ovate or globose, sometimes 1ft. high and 9in. to 12in. in diameter; spines radiating, unequal, three of them usually larger, broad, acuminate, transversely striated. California, 1877. A plant at Kew, about fifteen years old, is only 6in. high.

E. Visnaga. The correct name is *E. ingens.*

FIG. 362. PORTION OF RIDGE, WITH SPINES AND FLOWER, OF ECHINOCACTUS WISLIZENI.

E. Wislizeni (Wislizen's). *fl.* greenish-yellow, about 2in. long and broad, developed only on large plants. Summer and autumn. Stem depressed when young, large and cylindrical when old; ridges about a score, regular and sharp-edged, bearing bundles of spines at regular intervals, the outer and shorter ones being white and spreading, while from the middle of each tuft arise three 2in. long and one 3in. long, with the point hooked, and as strong as steel. See Fig. 362.

E. napinus and *E. Odieri* are very rare in cultivation.

ECHINOCYSTIS (from *echinos*, a hedgehog, and *kystis*, a bladder; in allusion to the prickly fruit). ORD. *Cucurbitaceæ*. A genus embracing about fifteen species of stove, greenhouse, or hardy, prostrate or climbing, annual or perennial herbs, all American. Flowers white, small or mediocre, monœcious; males racemose or paniculate; females solitary or borne with the males in the same axil. Fruit dry or berry-like, armed with long spines, one- to three-celled. Leaves palmately five- to seven-angled. *E. lobata*, the only species calling for mention here, is a hardy, nearly glabrous climber, thriving in a moist, rich soil. Propagated by seeds.

E. lobata (lobed). *fl.* greenish-white, small; sterile racemes often 1ft. long. July to September. *fr.* nearly 2in. long, armed with weak prickles; seeds ¾in. long. *l.* membranous, mucronately denticulate; lobes triangular. North America. (R. H. 1895, p. 9, f. 1.)

ECHINOPS. The species number about seventy, and are distributed over South Europe, tropical and North Africa, and Asia, as far as Japan.

ECHINOPSIS. The growing and resting seasons for *Echinopsis* are the same as for *Echinocactus*, and we may therefore refer to what is said under that genus for general hints with regard to the cultivation of *Echinopsis* in this country. None of the species require to be grafted to grow freely and remain healthy, as the stems are all robust

Echinopsis—*continued.*

FIG. 363. ECHINOPSIS EYRIESII FLORE-PLENO

enough and of sufficient size to take care of themselves. The only danger is in keeping the plants too moist in winter, for although a little water now and again keeps the stems fresh and green, it deprives them of that rest

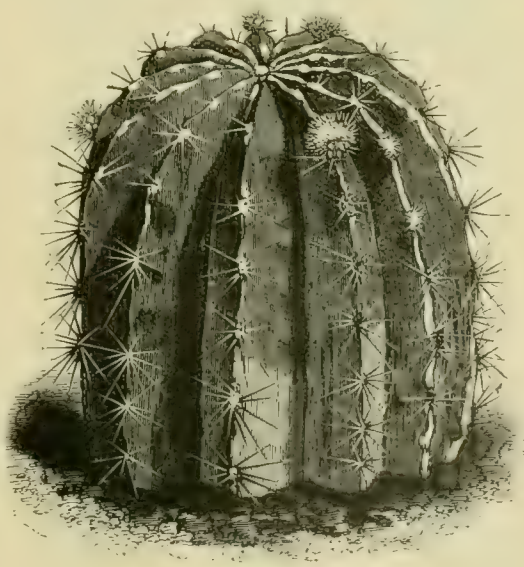


FIG 364. ECHINOPSIS MULTIPLEX.

Echinopsis—*continued.*

which is essential to the development of their large, beautiful flowers in summer.

To the species and varieties described on pp. 502-3, Vol. I., the following should be added:

E. cinnabarina (cinnabar-red). *fl.* produced from the outside of the depressed top of the stem; tube green, short; petals bright cinnabar-red, 2in. long. Stem 6in. to 8in. in diameter, 4in. high, resembling a sea-urchin; spiral formed by the tubercles rising gradually, each tubercle surmounted by a tuft of radiating spines and a cushion of wool. Bolivia, 1845. SYN. *Echinocactus cinnabarinus* (B. M. 4326).

E. Eyriesii flore-pleno (double-flowered). A form with several rows of petals, which impart a double appearance to the flowers. See Fig. 363.

E. multiplex (proliferous). This interesting species is shown, without flowers, in Fig. 364.

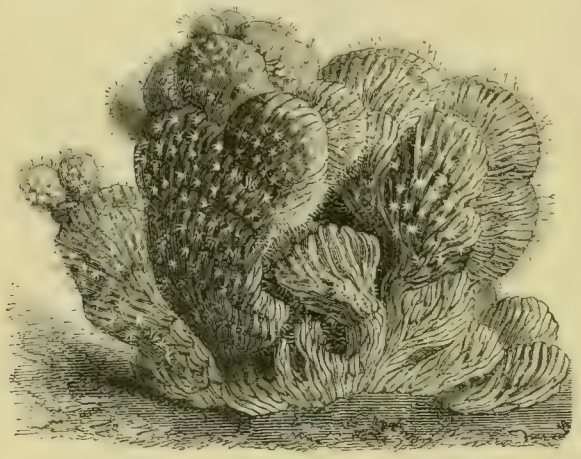


FIG. 365. ECHINOPSIS MULTIPLEX CRISTATUS.

E. m. cristatus (crested). Stems fasciated and divided into numerous crumpled, flattened branches. A remarkable monster. See Fig. 365.

E. Pentlandi (Pentland's). The correct name of *Echinocactus Pentlandi.*

E. P. flammea (flame-coloured). A variety having flowers only 2in. long (in the type they are 4in.).

E. P. ochroleuca (yellowish-white). This variety differs from the type in having yellowish-white flowers. 1897.

E. Philippii (Philippi's). *fl.* yellow, with reddish-tinted segments, about 1½in. long, campanulate; stamens in two distinct whorls, the outer arising from the base of the petals, the inner whorl united in a tube around the style. Stem cylindric, eight- to ten-angled, the angles tubercled; tubercles with about eight short and four or five long spines. Chili, 1883. SYN. *Cereus Philippii* (R. G. 1079, f. 1).

E. tubiflorus (tube-flowered). The correct name of *Echinocactus tubiflorus.*

ECHINOSTACHYS (of Brongniart). Included under **Æchmea** (which *see*).

ECHINOSTACHYS (of E. Meyer). A synonym of **Pycnostachys** (which *see*).

ECHIOIDES. A synonym of **Nonnea** (which *see*).

ECHIOPSIS. A synonym of **Lobostemon** (which *see*).

ECHITES. SYNS. *Heterothrix, Mesechites.* Several species formerly included hereunder are now referred to **Dipladenia, Mandevilla, Pachypodium,** and **Urechites.**

E. atropurpurea. The correct name is *Dipladenia atropurpurea.*

E. franciscea is a variety of *E. (f.) sulphurea*, which is the typical species.

E. nutans. This is synonymous with *Prestonia venosa.*

ECHIUM. To the species described on p. 504, Vol. I., the following should be added. Several plants formerly included in this genus are now classed under **Lobostemon.**

E. lusitanica (Portuguese). *fl.*, corolla-tube white, the limb bluish, with violet veins; spikelets simple, erecto-patent. *l.* lanceolate, the lower ones attenuated at base. Stem erect, simple at base, paniculate-branched at apex. Portugal. Perennial. SYN. *E. salamantica.*

E. plantagineum (Plantain-like).* *fl.* rich purplish-violet, showy; corolla four times as long as the calyx; spikes many, in an elongated panicle. June. *l.*, lower ones ovate or oblong; upper and floral ones cordate-lanceolate. Stem erect or diffuse. *h.* 3ft. Mediterranean region, 1658. Plant hairy. A fine annual or biennial species. SYN. *E. violaceum.*

E. rubrum (red).* *fl.* reddish-violet, disposed in an elongated, spike-like panicle; corolla four times as long as the calyx. May. *l.* linear-lanceolate, acuminate. Stems erect, simple, pilose. *h.* 1ft. to 2ft. Hungary, &c. A fine biennial. (B. M. 1822.)

E. salamantica (Salamanca). A synonym of *E. lusitanica.*

E. violaceum (violet). A synonym of *E. plantagineum.*

ECHTRUS. A synonym of **Argemone** (which *see*).

ECKARDIA. A synonym of **Peristeria** (which *see*).

EDGEWORTHIA. This genus is now regarded as monotypic, the species being *E. Gardneri* (B. M. 7180), with which *E. chrysantha* is synonymous.

EDGING-IRON. An illustration of this implement is given under **Verge-cutter** (p. 147, Vol. IV.).

EDIBLE FERN OF TASMANIA. *See* **Pteris aquilina esculenta.**

EDRAIANTHUS SERPYLLIFOLIUS. A synonym of **Campanula serpyllifolia** (which *see*).

EEL FERN. *See* **Acrostichum Herminieri.**

EEL GRASS. *See* **Vallisneria spiralis.**

EELWORMS (*Anguillidæ*). A popular name bestowed upon a very destructive group of minute translucent animals infesting Strawberries, Clover, Wheat, Potatoes, Cucumbers, Melons, Tomatoes, Vines, Onions, Hops, and Hyacinths, as well as Pasture Grasses and common wayside weeds. Eelworms are so readily introduced that the greatest care should be exercised when obtaining new potting soils, as this is a common source of trouble. The pests are barely visible to the naked eye, being only 1mm. long and whitish. They are pointed at either end.

Eelworms are found in large numbers; they pierce the tissues of their hosts, and extract therefrom the juices. The symptoms of attack vary with its severity, and a little with the species found. Melons, Cucumbers, and Tomatoes may collapse altogether, and without apparent reason, if the plants are not lifted and examined; or, again, there may be wart-like excrescences on the roots; bulbs (like Onions) may show signs of decay: Vines sometimes have a "cankerous" growth just beneath the soil, and the bark just at the roots may be removed; while the roots and foliage of other plants may be distorted, stunted, and unhealthy-looking. When once a plant is badly attacked, cure is practically out of the question. The soil should be removed, and deeply buried, and a fresh compost should be employed, first charring it or rendering it free from the pest by pouring over it boiling water. These remedies are only applicable when the disease is restricted, as for instance in the case of flowers, fruit, or vegetables under glass. Outside the pests are more difficult to control. Wherever kainit can be employed this is most beneficial. It should be used in conjunction with basic slag—two parts of the latter to one of the former: 2¾lb. of the combination to the square yard, if well forked in, will not be any too much. By way of preventive measures, turfy loam, when used comparatively fresh from the land for pot-plants, should be baked or scalded, while all affected plants should be destroyed by fire. Turf stacked for future use should be treated between each layer to a dressing of mustard refuse, as for Wireworms, using it plentifully. An alternation of crops should, wherever possible, be resorted to. Onions, for instance, should not follow Onions. Trenching Eelworm-infested soil would also help to get rid of the pests outdoors. *See also* **Nematoid Worms.**

EFFLORESCENCE. The time or act of flowering.

EGERIA. A synonym of **Elodea** (which *see*).

EGYPTIAN PAPER REED. *See* **Papyrus antiquorum.**

EGYPTIAN ROSE. *See* **Scabiosa arvensis.**

EGYPTIAN THORN. *See* **Acacia vera.**

EHRETIA. One or two species formerly included hereunder are now referred to **Bourreria** (which *see*).

FIG. 366. INFLORESCENCE OF EICHHORNIA AZUREA.

EICHHORNIA. About a dozen species are included in this genus. Inflorescence sessile or pedunculate in a leafy sheath; perianth funnel-shaped, the limb erecto-patent, more or less oblique; stamens six, unequally affixed to the tube, declinate. Leaves swimming or emerging, obovate, rounded, cordate, or rarely emarginate.

Two or three species of this genus are amongst the most beautiful subjects for the Lily tank—*E. azurea* (Fig. 366) and *E. crassipes* for instance. The former is a somewhat vigorous grower, and needs to be restricted or it will encroach upon the other subjects. This is best done by occasionally shortening back the stems, replanting the young growths. *E. crassipes* when cultivated unfortunately does not often produce its handsome flowers (see Fig. 367). It increases rapidly, and is very variable as to habit. Grown as a floating Aquatic, a peculiarity of the plant is that the petioles are short and very much inflated; but when the roots are in soil this inflation, according to Mr. Baker (of Oxford), diminishes, the petioles being almost cylindrical in form and much longer. To flower this species successfully the plants should be allowed to become crowded and the roots to mat. It should be located in the sunniest position in shallow water, with a little soil as a rooting medium. In its native habitat it increases so rapidly as to impede navigation.

E. speciosa (showy). The correct name of *E. crassipes.*

EKEBERGIA. Flowers polygamous, cymose, in axillary panicles; calyx five-cleft; petals five. Leaves impari-pinnate. *E. capensis* is the Essenhout or Essenboom of the colonists.

ELÆAGNUS. SYN. *Lepargyræa.* These are useful, hardy shrubs, as they are amongst the comparatively few which will flourish in sandy soils, and that are capable of withstanding long periods of drought. Preferably they should have a fairly rich, well-drained soil, and a sunny position. In winter, when the average shrubbery subject is not a pleasing picture, *Elæagnus* are bright, the gold- and silver-leaved kinds being particularly pretty. For covering

Elæagnus—*continued.*

walls they are also useful, as they are for disposing as lawn plants. In habit they are compact, and require little pruning beyond the removal of wrongly-placed growths. For colour, *E. pungens aurea* may be especially recommended; while for a dry position, such as on banks, *E. latifolia Simonii* can hardly be beaten.

To the species, &c., described on pp. 505-6, Vol. I., the following should be added:

E. angustifolia (narrow-leaved). The correct name of *E. hortensis.* (B. R. 1156.)

E. argentea is often confused with *Shepherdia argentea* in gardens.

E. canadensis (Canadian). A garden synonym of *E. argentea.*

E. edulis (edible). A synonym of *E. multiflora.*

E. latifolia (broad-leaved). *fl.* pale yellow or white, scented, many in a cluster. Late autumn. *fr.* red, fleshy, ⅜in. to 1½in. long. *l.* 4in. to 5in. long, variable, rounded to elliptic-lanceolate, silvery or rusty-red beneath; petioles ½in. to ¾in. long. Temperate Himalayas, &c., 1869. A deciduous bush, climber, or small tree. *E. Simonii* is a form of this.

E. l. tricolor (three-coloured). *l.* dark green, the centre variegated with golden and greenish yellow. 1889.

E. latifolia, of gardens. A synonym of *E. umbellata.*

E. multiflora (many-flowered). The correct name of *E. longipes.* (B. M. 7341.) SYNS. *E. edulis, E. rotundifolia.* There are several varieties of this species.

E. odorata (scented). A synonym of *E. longipes.*

E. orientalis (Eastern). *l.* usually broader, often ovate at base, silvery-lepidote or stellately pilose on both sides, greener above. Otherwise like *E. angustifolia,* of which some authorities class it as a variety. Orient.

E. parviflora (small-flowered). A synonym of *E. umbellata.*

E. pungens maculatus (spotted).* *l.* pale yellow, margined with bright green. 1888. A handsome variety. (G. M. 1891, t. 595.)

E. reflexa (reflexed). A synonym of *E. pungens.*

E. rotundifolia (round-leaved). A synonym of *E. multiflora.*

E. Simonii (Simon's). A form of *E. latifolia.*

E. umbellata (umbelled).* *fl.* white, ½in. long, fragrant, clustered, pedicellate, appearing with the leaves. June. *l.* oblong-lanceolate, obtuse, 1in. to 2½in. long, glabrous or sparsely pubescent above, silvery beneath; petioles ½in. long. Branches often thorny, not so dark as in *E. angustifolia.* Temperate Himalayas, 1829. A beautiful shrub, almost evergreen in some districts. SYNS. *E. latifolia* (of gardens), *E. parviflora* (B. R. xxix., t. 51).

FIG. 367. INFLORESCENCE OF EICHHORNIA CRASSIPES.

ELÆIS. Syn. *Alfonsia.* Three or four species, natives of tropical Eastern America and Africa, form this genus, which is closely allied to *Martinezia.* Flowers, males and females borne on different spadices, which are short and thick. Leaf segments ensiform, acuminate, recurved at base; petioles short and thick, the margins spiny or unarmed.

ELÆOCARPUS. Aceratium (kept distinct on p. 11, Vol. I.) is included hereunder by the authors of the "Genera Plantarum," the genus as thus constituted embracing upwards of fifty species, natives of tropical Asia, the Pacific Islands, and Australia. To those described on p. 506, Vol. I., the following should be added:

E. dentatus (toothed). *fl.* straw-coloured; petals trilobed; raceme axillary, simple. *l.* alternate, petiolate, oblong, attenuated at base, coriaceous, silky beneath. New Zealand, 1883. Syn. *E. Hinau.*

E. Hinau (native name). A synonym of *E. dentatus.*

E. oppositifolius (opposite-leaved). The correct name of *Aceratium oppositifolium.*

ELÆODENDRON. Colpoon-tree. Including *Rubentia.* To the information given on p. 506, Vol. I., the following should be added:

E. Argan (Argan). A synonym of *Argania Sideroxylon.*

E. capense is commonly known as the Cape Phillyrea.

E. orientale (Eastern). The correct name of *Aralia Chabrieri.*

E. sphærophyllum pubescens (spherical-leaved, pubescent). *fl.* small, in dense, axillary cymes. *l.* closely set, elliptic, obtuse or slightly emarginate at apex, rounded or slightly cordate at base, ¾in. to 1½in. long, finely toothed, the under-side (as well as the petioles and shoots) velvety-pubescent. Cape Colony, 1891. A branching, leafy, greenhouse shrub. Syn. *Guevina avellana* (of Italian gardens).

ELATE. A synonym of **Phœnix** (which *see*).

ELATERIDÆ. *See* **Spring-Beetles.**

ELATERIOPSIS. A synonym of **Cyclanthera** (which *see*).

ELATINEÆ. A small natural order (about a score species, in two genera) of aquatic, creeping or diffuse herbs or under-shrubs, broadly dispersed, and ranking between *Tamariscineæ* and *Hypericineæ.* The species are of no horticultural value.

ELECTROSPERMA. A synonym of **Eriocaulon** (which *see*).

ELEPHANT HAWK-MOTH. *See* **Sphingidæ.**

ELEPHANT'S HEDGE BEAN-TREE. *See* **Schomburgkia latifolia.**

ELEPHANTUSIA. A synonym of **Phytelephas** (which *see*).

ELETTARIA. Syn. *Cardamomum.* According to the "Index Kewensis," this genus now embraces upwards of a dozen species. Flowers shortly pedicellate, bracteate; lip obovate-cuneate; panicle produced direct from the root-stock, long, flexuous, decumbent; bracts two- or three-flowered.

ELEUTHERINE (from *eleutheros*, free; in allusion to the free filaments). Syns. *Galatea, Keitia.* Ord. *Irideæ.* A monotypic genus. The species is a pretty, stove, bulbous plant. For culture, *see* **Ixia.**

E. anomala (anomalous). A synonym of *E. plicata.*

E. plicata (folded). *fl.* borne in several peduncled clusters, subtended at the base by a reduced, plicate, linear leaf; perianth white, fugitive, ¾in. across, without any tube above the ovary; stamens attached to the base of the segments; filaments short, free; peduncle 6in. to 12in. long. April. *l.* one or two, linear, plicate, 1ft. to 1½ft. long. Tropical America. Syns. *E. anomala* (B. R. 1843, 57), *Keitia natalensis, Marica plicata* (B. M. 655), *Sisyrinchium palmifolium.*

ELICHRYSUM PROLIFERUM. A synonym of **Phænocoma prolifera** (which *see*).

ELISENA. Syns. *Liriope* and *Liriopsis.* The species are natives of the Andes. Flowers white, few in an umbel; perianth tube short, broadly funnel-shaped, the segments long, equal, linear; stamens as long as the segments; peduncle long, solid. Leaves lorate. Bulb tunicated.

ELISMA NATANS. The correct name of the plant described on p. 47, Vol. I, as **Alisma natans** (which *see*).

ELK NUT. *See* **Pyrularia oleifera.**

ELK'S-HORN FERN. *See* **Platycerium.**

ELLEANTHUS. Flowers in terminal spikes; sepals free, erect; petals often narrower than the sepals; column erect, semi-terete or two-winged in the middle. Leaves sessile, plicate.

ELODEA. *Anacharis, Apalanthe,* and *Egeria* are synonymous with this genus.

ELODEA (of Spach). Included under **Hypericum** (which *see*).

ELSHOLTZIA (named in honour of Johann S. Elsholtz, author of "Flora Marchica," 1663, &c.). Including *Aphanochilus.* Ord. *Labiatæ.* A genus embracing about a score species of stove, greenhouse, or hardy herbs or shrubs, with small flowers, natives of temperate and tropical Asia, one being European. One or two of the species—*e.g., E. blanda* (Syn. *Aphanochilus blandus,* B. M. 3091)—have been introduced, but they have little horticultural value.

EMBAMMA. A synonym of **Pterisanthes** (which *see*).

EMBELIA. Syn. *Samara* (of Linnæus). About sixty species, found in the tropics of the Old World, are comprised in this genus.

EMBLICA. Included under **Phyllanthus** (which *see*).

EMBOTHRIA. This genus is closely allied to *Lomatia.* Flowers twin, pedicellate, racemose, hermaphrodite; raceme axillary or terminal. Leaves alternate or rarely opposite, undivided or dissected.

EMERICIA. A synonym of **Vallaris** (which *see*).

EMILIA (probably a commemorative name). Ord. *Compositæ.* A small genus (four or five species) of stove, greenhouse, or half-hardy, annual or perennial herbs, often glaucous, glabrous or hairy, natives of India and tropical Africa. Flower-heads yellow or red, long-peduncled, solitary or loosely corymbose, homogamous, discoid; florets five-toothed; involucre cylindrical, the bracts equal, in one series; pappus white. Radical leaves crowded, petiolate, entire, toothed, or lyrate-pinnatifid; cauline ones few, amplexicaul. *E. flammea* and *E. sonchifolia,* the only species calling for description here, are half-hardy annuals, thriving in ordinary soil. Propagated by seeds, sown in heat in early spring, or in the open later.

E. flammea (flame-coloured). *fl.-heads* scarlet, much longer than the involucral bracts. *l.*, lower ones petiolate, obovate or almost spathulate, entire or toothed; upper ones large, oblong or ovate-oblong, deeply sagittate-eared. India and the Philippines. Plant erect; commonly cultivated in India. Syn. *Cacalia coccinea* (B. M. 564).

E. sonchifolia (Sonchus-leaved). Scarlet Cacalia. *fl.-heads* purple; florets about equalling the involucral bracts. *l.*, lower ones lyrate-pinnatifid or sinuate-toothed, puberulous or glabrous. Flowering branches leafy. India and Africa. Plant erect or diffuse. Syn. *Cacalia sonchifolia.*

EMMENANTHE. Calyx segments ten to twelve, unequal; corolla broadly tubular-campanulate, with six to ten broad, oblong, almost spreading lobes. *E. penduliflora,* a handsome, hardy, villous-pubescent or viscid annual, has been introduced. For culture, *see* **Annuals.**

E. penduliflora (pendulous-flowered). *fl.* cream-coloured or yellow, at length pendulous, nearly ½in. long; racemes panicled, mostly short and loose. July. *l.* pinnatifid into numerous short and somewhat toothed or incised lobes. *h.* 9in. to 12in. California, 1892. (G. C. 1892, xi., p. 339, f. 49.)

EMPHYTUS CINCTUS. *See* **Rose Sawflies,** Vol. III, p. 327.

EMPODIUM. A synonym of **Curculigo** (which *see*).

EMPUSA. Included under **Liparis** (which *see*).

ENARGEA. A synonym of **Luzuriaga** (which *see*).

ENCELIA (from *egchelion,* a little eel; in allusion to the appearance of the seeds). Syn. *Pallasia* (of L'Héritier). Ord. *Compositæ.* A genus embracing about a score species of branched, villous, pubescent, or tomentose herbs, sometimes shrubby at the base, natives of Mexico or Western America, from Chili to California. Flower-heads yellow, violet, or purplish, radiate, mediocre or rather

Encelia—*continued.*

large, long-pedunculate at the tips of the branches, rarely smaller and irregularly panicled; involucral bracts in two or three series; ray florets spreading, entire or shortly toothed. Leaves opposite, or the upper ones rarely nearly all alternate, entire, toothed, or lobed. *E. canescens*, the only species calling for mention here, is a pretty, dwarf, greenhouse sub-shrub, thriving in loamy soil. Cuttings, inserted under a glass, will strike readily, if not over-watered.

E. canescens (hoary). *fl.-heads* orange; involucral scales villous, ciliated. July. *l.* broadly ovate, entire, obtuse, softly canescent. *h.* 1½ft. Peru, 1786. (B. R. 909.) SYN. *Pallasia halimifolia.*

ENCENO OAK. *See* **Quercus aquifolia.**

ENCEPHALARTOS. SYN. *Arthrozamia.* Cones large, the males sometimes twin or ternate, with broad or elongated-cuneate scales, the females thick, with numerous peltate scales. Leaves spreading-recurved, petiolate, linear-oblong; leaflets many pairs, rigid, sessile. To the species described on p. 508, Vol. I., the following should be added:

E. brachyphyllus is a form of *E. Caffer.*

E. Caffer (Kaffir). The correct name of *E. caffra*, of which *E. brachyphyllus* is a form.

E. cycadifolius (Cycas-leaved). The correct name of *E. Frederici-Gulielmi.*

E. elongatus (elongated). *l.*, lower pinnæ alternate, the upper ones nearly opposite, long-linear-lanceolate, spiny-acuminate at apex, entire, glabrous when adult; petiole and rachis obtusely tetragonal. Trunk glabrous. South Africa, 1840.

E. Frederici-Gulielmi. The correct name is *E. cycadifolius.*

E. gracilis (slender). A synonym of *E. Ghellinckii.*

E. Mackenii. The correct name is *Macrozamia Pauli-Gulielmi.*

E. regalis (regal).* *l.* twelve to twenty at the apex of the cylindrical trunk, 6ft. to 7ft. long; pinnæ lanceolate, with occasional spines on the upper margin. Zululand, 1889. A noble decorative plant, doubtfully distinct from *E. Hildebrandtii.*

E. Vromii (Vrom's). A variety of *E. Altensteinii.*

ENCHOLIRION. Included under **Dyckia** and **Tillandsia** (which *see*).

ENDEMIC. Restricted to one locality or region.

ENDERA. A synonym of **Taccarum** (which *see*), the correct name of *E. conophalloidea* being *T. cylindricum.*

ENDOPISA PROXIMANA and **ENDOPISA NIGRICANA.** *See* **Pea Pests.**

ENDOTROPIS. A synonym of **Cynanchum** (which *see*).

ENDROSIS FENESTRELLA. *See* **Tineina.**

ENDYMION. A synonym of **Scilla** (which *see*).

ENEMION. Included under **Isopyrum** (which *see*).

ENGELMANNIA (named in honour of George Engelmann, a German botanist, who wrote on American plants). SYN. *Angelandra.* ORD. *Compositæ.* A monotypic genus. The species is an erect, hardy, perennial, pubescent herb. It thrives in ordinary garden soil, and may be increased by seeds or by divisions.

E. pinnatifida (pinnatifid). *fl.-heads* golden-yellow, 1in. to 2in. in diameter, corymbosely paniculate; involucral bracts in several series; ray florets eight to ten, female; disk hermaphrodite, but sterile. July. *l.* petiolate, 2in. to 5in. long, oblong, sinuate-pinnatifid to below the middle; lobes toothed, entire, or lobulate. *h.* 1ft. to 2ft. Prairies of North America, 1881. (B. M. 6577.)

ENGELMANNIA (of Pfeiffer). A synonym of **Cuscuta** (which *see*).

ENGLISH IRIS. A popular name for the varieties of **Iris xiphioides** (which *see*).

ENICOSTEMA (from *henikos*, single, and *stema*, a stamen; there is one stamen to each of the five corolla lobes). SYNS. *Adenema, Henicostemma, Hippion, Slevogtia.* ORD. *Gentianeæ.* A monotypic genus. The species, *E. littorale* (SYNS. *Slevogtia occidentalis, S. orientalis*), is a glabrous, stove herb, with small flowers, found in tropical Asia and Africa and in the West Indies. It has been introduced, but is of very little horticultural value.

ENKIANTHUS. Including *Meisteria.* SYN. *Melidora* (in part). These plants are found in China, Japan, and the Eastern Himalayas. To the species described on p. 510, Vol. I., the following should be added:

E. cernuus (drooping). *fl.* reddish, campanulate, in a solitary, terminal, simple, drooping raceme. *l.* obovate or obovate-spathulate, cuneate at base, uncinate-serrulate, the serratures bristly-pointed. Japan (recently introduced). SYN. *Meisteria cernua.*

ENODIUM. A synonym of **Molinia** (which *see*).

ENSLENIA (named in honour of Aloysius Enslen, an American botanist, who collected in the Atlantic United States early in the nineteenth century). SYN. *Ampelanus.* A small genus (three species) of twining herbs or shrubs, all American. Flowers white, small or rather large, in umbelliform or shortly-racemose cymes. Leaves opposite, membranous, cordate. *E. albida*, a hardy species with whitish flowers, has been introduced, but is not of much horticultural value.

ENTOMOSPORIUM MACULATUM. *See* **Leaf Blight** and **Leaf Scald.**

EOPEPON. Included under **Trichosanthes** (which *see*), the correct name of *E. vitifolius* being *T. Kirilowii.*

EPACRIS. To the species and varieties described on pp. 511-2, Vol. I., the following should be added:

E. pungens (pungent), of Cavanilles. A synonym of *Lysinema pungens.*

E. purpurascens. Two very attractive double varieties are: *alba*, with blush-white, and *nivalis*, with pure white, flowers. 1883.

E. multiflora (I. H. 1860, t. 266), a species with crimson and white flowers, has also been introduced.

Varieties. To the list of varieties described on p. 512, Vol. I., the following may be added:

ALBA ODORATA, ATTRACTION, CRITERION, DELICATA, DIADEM, EXCELSIOR, HER MAJESTY, JUBILEE, KITTY TODMAN, PRINCESS BEATRICE, ROSE PERFECTION, and THE PREMIER.

EPEIRA DIADEMATA. *See* **Spiders.**

EPERUA (the native name for a sword; in allusion to the shape of the pods). SYNS. *Dimorpha, Panzera.* Including *Parivoa.* ORD. *Leguminosæ.* A small genus (about half-a-dozen species) of tall or weak, stove, unarmed trees, natives of tropical America. Flowers purple, red, or white, racemose, showy; petal one, sessile, very broad; stamens ten. Leaves abruptly pinnate or rarely almost impari-pinnate; leaflets few pairs, coriaceous. *E. grandiflora* (SYNS. *Dimorpha grandiflora* and *Parivoa grandiflora*) has been introduced, but is not in general cultivation.

EPHEDRA. SYN. *Chætocladus.* To the species described on p. 512, Vol. I., the following should be added:

E. altissima (very tall). *fl.* pale yellow; male catkins many on panicled branchlets, small, ovoid. *fr.* red, oval. Branches and branchlets glaucous-green, the former almost terete, the latter opposite, ternate, or solitary, spreading. *h.* 12ft. to 24ft. North Africa, 1899. (B. M. 7670.)

E. trifurca (thrice-forked). This is described as "an upright bush, 2ft. to 4ft. high, with Equisetum-like branches." North-west America, 1893.

E. vulgaris is a form of *E. nebrodensis.*

EPHEMERUM. A synonym of **Tradescantia** (which *see*).

EPIBATERIUM. A synonym of **Cocculus** (which *see*).

EPI-CATTLEYA. ORD. *Orchideæ.* Bigeneric hybrids, derived from the intercrossing of *Epidendrum* and *Cattleya.* They require a warm, intermediate house temperature, with a liberal supply of atmospheric moisture during the greater part of the year. The potting compost should consist of two parts fibrous peat and one of sphagnum, pressed moderately firm. The pots should be clean, and drained to two-thirds their depth with clean broken crocks. Through the growing season water should be applied freely, but only sufficient is required during the resting period to retain a plump and desirable condition of the pseudo-bulbs.

Epi-Cattleya—*continued.*

The following is a list of the hybrids, together with their recorded parentage:

guatemalensis	*E. aurantiacum* and *C. Skinnerii* (nat. hyb.).
guatemalensis Wischusenana	*E. aurantiacum* and *C. Skinnerii* (nat. hyb.).
matutina	*C. Boweringiana* and *E. radicans* (Veitch).
Mrs. James O'Brien	*C. Boweringiana* and *E. O'Brienianum* (Veitch).
radiato-Boweringiana	*E. radiatum* and *C. Boweringiana* (Veitch).

EPICHIL, EPICHILIUM. A term applied to the upper part of the lip of an Orchid when that part differs materially from the lower portion, or hypochil.

EPIDENDRUM. Including *Amphyglottis*, *Dinema*, and *Physinga*. Tropical America is the headquarters of this genus. To the species and varieties described on pp. 512-14, Vol. I., the following should be added. A few species formerly classed hereunder are now referred to **Hormidium** and **Lanium**. *See also* **Barkeria** and **Nanodes**, which are included in this genus by Bentham and Hooker. Unless otherwise specified, stove treatment is required.

E. æmulum (emulating). A synonym of *E. fragrans*.

E. alatum (winged). The correct name of *E. a. majus*.

E. amabile (lovely). A name applied in gardens to both *E. dichromum* and *E. Ortgiesii*.

E. arachnoglossum (spider's tongue). *fl.* reddish-purple (carmine-violet), in a short, corymbiform or roundish raceme; sepals and petals acute, recurved; lateral lobes of lip roundish, pectinate, the middle one cuneate, deeply bilobed; column violet, club-shaped. *l.* distichous, alternate, glabrous, sessile, oblong-lanceolate, obtuse, fleshy. Stems tufted, erect, naked above. Colombia, 1883. (R. H. 1882, p. 554.)

E. a. candidum (white).* *fl.* wholly white, with the exception of the orange lateral calli of the lip. 1886.

E. aromaticum (aromatic). *fl.* numerous, fragrant, about 1in. across; sepals and petals very pale yellow; lip whitish, streaked with red, three-lobed, the side lobes appressed to the column except at the apex; scape two or three times as long as the leaves. *l.* 9in. to 12in. long, linear, rigid. Pseudo-bulbs 2in. to 3in. in diameter, two- or three-leaved. Guatemala, 1835. (Ref. B. ii., t. 89.)

E. atropurpureum album (white).* A white-lipped variety.

E. a. Randianum (Rand's). *fl.*, sepals and petals greenish-brown, with paler margins; lip white, large, marked with contiguous red veins at the base. Amazons, 1886. (L. ii., t. 1; R. ser. ii., t. 94.) SYN. *E. Randianum*.

E. a. roseum (rosy).* *fl.* smaller than in *album*; sepals and petals deep purplish-brown; lip rose-colour, with a purple blotch near the base. (F. d. S. iv., t. 372; I. H. 1868, t. 541; P. M. B. xi., p. 243.)

E. atrorubens (dark red). *fl.* 1in. across; sepals and petals of a very dark reddish-purple; lip of a lighter shade, free, three-lobed; scape loosely paniculate. October. *l.* linear-oblong, 8in. long, obtuse. Mexico, before 1892.

E. auriculigerum (auricle-bearing). *fl.*, sepals and petals long and straight; lip auricled at the base, the middle lobe triangular, acuminate, with two long keels, swollen between the auricles. 1888. Allied to *E. Brassavolæ*.

E. auritum (eared). *fl.* 1in. across, with an Apple-like fragrance; sepals and petals light yellow, the petals much shorter; lip deeper yellow, with a purple stain at base; peduncles three- to five-flowered. *l.* 6in. long, narrow-ligulate. Pseudo-bulbs compressed, 1½in. long, one-leaved. Guatemala, 1839.

E. Barkeriola (Barkeriola). *fl.*, sepals and the light rose-coloured petals nearly equal; lip white, with a deep purple blotch and some short purple lines on the disk, where there are two raised lines, pandurate or obovate; raceme one-sided. *l.* lanceolate, acute, wavy, reddish beneath and on the margins. Habitat not recorded, 1884. SYN. *Barkeria Barkeriola*.

E. bituberculatum (two-tubercled). This species is allied to *E. Schomburgkii*, but is smaller and slenderer, with rosy-purple flowers; calli at base of lip yellow. Habitat not recorded, 1892.

E. Capartianum (Dr. Capart's). A synonym of *E. Godseffianum*.

E. Christyanum (Christy's). *fl.* greenish and brown, in an erect raceme; sepals oblong, apiculate; petals spathulate; lateral segments of lip sub-quadrate, extrorse, the middle one triangular, apiculate; column trifid. *l.* ligulate, acute. Pseudo-bulbs long-pyriform, two-leaved. Bolivia, 1884.

E. ciliare (ciliated).* *fl.* fragrant, several in a raceme, each with a long bract at base; sepals and petals greenish-yellow, linear, acute; lip white, three-parted, the lateral lobes pectinately incised, the middle one setaceous, much longer. Winter. *l.* in pairs. Pseudo-bulbs oblong, obtuse. Tropical America, 1790. One of the first epiphytal Orchids cultivated in English gardens. (B. R. 784.) *E. cuspidatum* (B. M. 463; B. R. 783; L. B. C. 10) is considered a variety of this species; the flowers are yellower and larger, and the middle lobe of the lip is linear-lanceolate, and not appreciably longer than the side ones. 1844.

E. cochleatum (snail-shell-like).* *fl.* 3in. to 4in. across; sepals and petals greenish-white, linear; lip sub-orbicular or fan-like, somewhat resembling a snail-shell, deep maroon-purple beneath, yellowish-green above, with a large maroon-purple blotch on each side; calli three, white; raceme four- to seven-flowered. *l.* acute, 6in. long. Stems pseudo-bulbous, 3in. to 4in. long, two-leaved. West Indies, 1787. Said to have been the first epiphytal Orchid which flowered in this country. (B. M. 572.) SYN. *E. lancifolium* (B. R. 1842, t. 50).

E. coriaceum (leathery). A form of *E. variegatum*.

E. crassifolium (B. M. 3543) is synonymous with *E. elongatum*.

E. cuspidatum (cusp-pointed). A variety of *E. ciliare*.

E. densiflorum (dense-flowered). A variety of *E. polyanthum*.

E. dichromum amabile (lovely). *fl.* usually rose-coloured, with a deep purplish-crimson lip, remaining in beauty a long time. 1892. (W. O. A., t. 452.)

E. diffusum (diffuse). A synonym of *Seraphyta diffusa*.

E. diotum (two-eared). *fl.* more than 1in. across, very sweetly scented; sepals and petals cinnamon-brown, with wavy edges; lip yellow, streaked with deep brown, thick and fleshy; scape twice as long as the leaves, many-flowered. *l.* about 1ft. long, spreading. Pseudo-bulbs elongated, one-leaved. Guatemala.

E. Ellisii (Ellis's). *fl.* rose-coloured, with a yellowish crest on the lip, disposed in short racemes. *l.* 4in. long. Stems 1½ft. high. Colombia, 1894.

E. elongatum (lengthened). The correct name of *E. crassifolium*.

E. Endresii (Endres').* *fl.* as large as those of *E. ellipticum*; sepals white, tipped green, the upper one cuneate-oblong, acute, the lateral ones triangular; petals white, spathulate; lip blotched mauve, curiously cut, with two triangular edges at the base, the anterior lacinia cuneate-obreniform. *l.* about a dozen, like those of Box. Costa Rica, 1883. (G. C. n. s. xxii., p. 504.)

E. falsiloquum (lying). *fl.* paniculate; sepals and petals whitish-ochre; lip white, with three linear, acute, depressed, mauve keels; calli white. *l.* linear, acuminate. Habitat not recorded, 1885. Allied to *E. verrucosum*.

E. Flos-aëris (air-flower). A synonym of *Arachnanthe moschifera*.

E. fragrans (fragrant).* *fl.* very fragrant, 2in. across, inverted; sepals and petals creamy-white; lip white, streaked with purple, sub-orbicular, with a fleshy callus at base; peduncles short, few-flowered. *l.* lanceolate, 8in. to 12in. long. Stems 3in. to 4in. high, one- or two-leaved. Tropical America, 1778. (B. M. 669.) SYN. *E. æmulum* (B. R., t. 1898).

E. fraudulentum (fraudulent). *fl.* light rose-coloured, small, the column and lower part of the ovary purple, the keel and calli yellow. 1886.

E. fulgens (brilliant). A synonym of *E. Schomburgkii*.

E. glaucum (glaucous). A synonym of *Dichæa glauca*.

E. glumaceum (glume-like). *fl.* 1½in. across, inverted, fragrant; sepals and petals white striped with pale rose on the inside, white on the outside; lip stained and streaked with rose in the centre, margined with white, acuminate; peduncles racemose. *l.* 6in. to 8in. long. Pseudo-bulbs pyriform, two-leaved. Pernambuco, 1837. (B. R. 1840, t. 6.)

E. Godseffianum (Godseff's).* *fl.* nearly 2in. across; sepals and petals yellowish-green, suffused with a purplish tone; lip white, the front lobe veined with light rose; peduncle slender, proceeding from the apex of the pseudo-bulb, more than 2ft. long. Brazil, 1892. SYN. *E. Capartianum* (L. vii., t. 333).

E. Hartii (Hart's). *fl.* whitish-yellow, small, disposed in branched, terminal panicles. *l.* linear, 4in. long. Stems 8in. long. Trinidad, 1894. Allied to *E. purum*.

E. hastatum (halberd-shaped). *fl.* having brownish-green sepals and petals and a pure white lip. 1896. A pretty little species.

E. ibaguense (Ibagué). *fl.* in a dense, almost globose head; sepals and petals orange; lip yellow, obcordate, the lateral lobes cordate, rounded at the tip and fringed. *l.* very fleshy, amplexicaul, oblong, obtuse. Stems tall, slender, the upper portion leafy, the extreme end leafless. Colombia, Peru, 1857. (F. M. 1868, t. 390.)

E. Imperator (emperor). A garden synonym of *E. leucochilum*.

E. inversum (inverted). *fl.* pale straw-coloured, or white striated with light rose, with a purple blotch on the lip, and sometimes with a few purple spots at the base of the other segments, crowded, fragrant; calli bright yellow; peduncles

Epidendrum—*continued.*

racemose. *l.* 4in. to 6in. long. Pseudo-bulbs fusiform, 3in. to 4in. long, two-leaved. Minas Geraes, 1839.

E. ionocentrum (violet-spurred). *fl.*, sepals and petals lemon-coloured, spotted with greenish-brown, lanceolate, acuminate; lip white, violet or purple in the centre; raceme twenty to twenty-four flowered. Pseudo-bulbs broad. Otherwise like *E. Brassavolæ*.

E. ionosmum (Violet-scented).* *fl.* fragrant, 1¼in. across; sepals and petals greenish-brown, bordered with pale yellow, obovate; lip three-lobed, yellow streaked with red, the side lobes erect, the mid-lobe emarginate; peduncles racemose, few-flowered. *l.* oblong-lanceolate, 3in. to 4in. long. Pseudo-bulbs globose, three-leaved. British Guiana, about 1838.

E. Kienastii (Kienast-Zolly's). *fl.*, sepals and petals very light rose, with darker purple veins, the sepals lanceolate, the petals very cuneate at base; lip white, with fine purple, callose lines on the wavy mid-partition, the side partitions cuneate-ligulate, two-toothed outside; raceme several-flowered. *l.* usually two, 6in. long, ½in. to 1in. broad, cuneate-oblong, acute. Mexico, 1837.

E. lancifolium (lance-leaved). A synonym of *E. cochleatum*.

E. latifolium (broad-leaved). A synonym of *E. nocturnum*.

E. Laucheanum (Lauche's). *fl.* wholly brownish, with the exception of the lip, which is green, disposed in terminal, many-flowered racemes. *l.* 3in. to 6in. long. Stems 8in. high. Origin unknown, 1893.

E. leucochilum (white-lipped). *fl.*, sepals and petals light yellowish-green, reflexed; lip ivory-white, three-lobed; peduncles rising from a compressed sheath, five- to nine-flowered. Stems as thick as a cedar pencil, 1½ft. to 2ft. high, three- to five-leaved. Rhizome stout, woody. Colombia and Venezuela, 1842 and 1875. (P. F. G. iii., p. 146.) SYN. *E. Imperator*, of gardens.

E. Liliastrum (Liliastrum). A synonym of *Sobralia Liliastrum*.

E. Mantinianum (Mantin's). *fl.* of a pale whitish-green, large, solitary, marked with purplish-brown dots on the veins of the sepals and petals, and with larger markings on the acute lip. *l.* glaucous-green. Habitat not recorded, 1892. A dwarf species. (L. H. xxxix., t. 150.)

E. Mathewsii (Mathews'). *fl.*, sepals and petals stained purplish outside, small, nearly transparent, the lateral sepals connate half-way up; lip deep, dull blood-purple, shining, orbicular, bifid at apex, convex above, concave beneath, completely concealing the lateral sepals. *l.* distichous, rigid, fleshy. Stems short, procumbent. Known in gardens as *Nanodes Mathewsii*. Peru, 1886.

FIG. 368. EPIDENDRUM MEDUSÆ.

E. Medusæ (Medusa's). This is the correct name of the plant described as *Nanodes Medusæ*. See Fig. 368.

E. Mooreanum (F. W. Moore's). *fl.* very fragrant; sepals and petals light green; lip deep purple, with a light green margin; panicle lax; leaves linear, 1ft. long. Costa Rica, 1891.

E. nocturnum (nocturnal). *fl.*, sepals and petals pale ochreous-yellow or greenish-white; lip white, three-lobed, with two yellow or white calli at the base of the mid-lobe; peduncles eight- to ten-flowered. *l.* linear or oblong-lanceolate, 6in. to 8in. long.

Epidendrum—*continued.*

Stems stoutish, 1½ft. to 2½ft. long. Tropical America, before 1816. (B. M. 3298.) SYN. *E. latifolium* (B. R. 1961).

E. oncidioides (Oncidium-like).* *fl.* yellow, blotched brown, very fragrant; sepals and petals obovate, unguiculate; lip three-lobed, the lateral lobes narrow, obtuse, flat, much shorter than the roundish, cuspidate middle one, the disk three-keeled; panicle long, racemose. *l.* two or three, 2ft. long, 1½in. wide. Stem 3ft. to 4ft. high. Surinam. A stately species. (B. R. 1623; I. H. ser. v. 28.)

E. Ortgiesi (Ortgies'). *fl.* rather large, disposed in a raceme; sepals and petals red, bordered with white; lip purple. *l.* one or two, strap-shaped. Habitat not recorded, 1892. A showy species. SYN. *E. amabile*, of gardens.

E. pallidiflorum (pale-flowered). *fl.* pale yellow, 1in. across, usually with some purple streaks at the apex of the column and on the side lobes of the lip; peduncles drooping, many-flowered. *l.* linear-oblong, 5in. to 7in. long. Stems terete, 1ft. to 1½ft. high. West Indies, 1823.

E. paytense (Payta). *fl.* of a brilliant scarlet-vermilion, with some orange on the lip, which is also marked with some darker spots. *l.* short, very strong, oblong, acute, tinted purplish-brown. Shoots stiff, with purplish-brown sheaths. Colombia and Peru, 1885.

E. polyanthum (many-flowered). *fl.* orange or salmon-colour, with a strong scent of cowslips; sepals ovate-lanceolate, acute, striated; petals linear, reflexed; lip three-lobed, three-ribbed, the lateral lobes sub-cuneate, retuse, the middle one retuse; panicle strict, simple. *l.* distichous, ovate-lanceolate, acute. Mexico, 1841.

E. p. asperum (rough). A variety having the ovaries and rachis densely covered with small warts. 1885.

E. p. densiflorum (dense-flowered). *fl.* greenish, with a little pink on the edges and in the middle of the lip. 1836. SYN. *E. densiflorum* (B. M. 3791).

E. polybulbon (many-bulbed). *fl.* 1in. across; sepals and petals tawny or light yellow, with a brown centre; lip white, with a short claw; peduncles one-flowered. *l.* ovate-oblong, 1in. to 1½in. long. Pseudo-bulbs produced from a wiry rhizome at intervals of about 1in., ovoid, ½in. long. West Indies, &c, 1841. SYN. *Dinema polybulbon* (B. M. 4067).

E. pristes (saw-like). A synonym of *E. Schomburgkii*.

E. Pseudepidendrum auratum (golden).* *fl.*, disk of the lip crimson, the borders deep orange. 1885. A fine variety.

E. pugioniformis (dagger-like). *fl.* large, usually two in a sub-sessile, terminal raceme; sepals and petals at first greenish, then yellowish; lip at first white, afterwards yellow, three-parted, cordate at base. *l.* 4in. to 6in. long, narrow-lanceolate-oblong. Mexico, 1890. Allied to *E. leucochilum*.

E. punctulatum (slightly dotted). *fl.* stellate, in a slender panicle; sepals and petals brown inside, green outside, lanceolate, acute; lip sulphur, with minute dots, trifid, the side laciniæ square, the middle one sessile, ovate, acute, the mid-nerves thickened; column brown and green; border of the anther-lid white, spotted brown. Mexico, 1835. Greenhouse.

E. purum (pure).* *fl.* pure white, sweetly scented, in a slender, nodding raceme; scape terminal. Spring and summer. *l.* narrow, obtuse, about 6in. long, light green, persistent. Stems erect, rather stout, about 2ft. high. Caraccas, 1842.

E. pusillum (small). *fl.* yellowish-green, dotted with brown, solitary. *l.* 5in. long. Pseudo-bulbs ovoid-globular. Brazil, 1891. Allied to *E. tampense*.

E. radiatum (radiating).* *fl.* 1½in. across; sepals and petals cream-coloured, reflexed; lip white, with radiating bright purple lines, concave, shell-like; racemes seven- or more-flowered. *l.* linear-ligulate, 10in. to 15in. long. Stems shortly fusiform, stalked, 3in. to 5in. long, two- or three-leaved. Rhizome woody. Mexico, 1841. (B. R. 1842, t. 45.)

E. Randianum (Rand's). A form of *E. atropurpureum*.

E. replicatum (bent back). *fl.*, sepals and petals yellowish-brown, bordered with yellow; lip white, streaked and veined with rosy-pink, three-lobed, the sides of the front lobe turned downwards; racemes terminal, 1ft. to 1½ft. long, many-flowered. Summer. *l.* long, strap-shaped, persistent. Pseudo-bulbs oblong-ovate, two-leaved. Colombia, 1881.

E. sceptrum (sceptre).* *fl.* small, sometimes three dozen in a raceme; sepals and petals golden-yellow, spotted dark purple, the sepals lanceolate, the petals obovate; lip white at base, profusely marked bright purple; racemes 1ft. to 2ft. long. September and October. *l.* long, thin, remote, lorate. Pseudo-bulbs pear-shaped, compressed, 1ft. long. Venezuela, Colombia, 1843. (B. M. 7169.)

E. Schomburgkii (Schomburgk's). *fl.* rich vermilion-scarlet; sepals and petals linear-lanceolate; lip three-lobed, strongly keeled, bicallose at base, the lateral lobes broadly semi-ovate, rounded and lacerated behind, the front lobe cuneate, gradually widening upwards, the edge denticulate, the apex shortly cuspidate; raceme short, close or corymbiform. *l.* distichous, oblong, obtuse, fleshy. Demerara, &c. A handsome species. (B. iv. 165; B. R. 1838, 53.) SYNS. *E. fulgens*, *E. pristes*.

Epidendrum—*continued.*

E. selligerum (saddle-bearing). *fl.* fragrant, 1¼in. across; sepals and petals brown with a pale margin, spathulate, concave; lip having the side lobes white, the crisped mid-lobe light purple, and the disk saddle-like; peduncles 3ft. to 4ft. long, many-flowered. Pseudo-bulbs ovoid, the largest 3in. to 4in. in diameter, two-leaved. Guatemala, 1836.

E. spondiadum (Spondias). *fl.*, sepals and petals reddish-green, shading to dull purple, acute or acuminate; lip dark, margined with pale green; peduncle many-flowered. The Spondias, Costa Rica, 1893. In general appearance this resembles *E. variegatum.* (B. M. 7232.)

E. Stamfordianum Leeanum (Lee's). *fl.*, sepals and petals ochre-coloured inside, covered with purple hieroglyphic markings, scarcely translucent outside; lip light rose, purple-spotted inside, broad. 1837.

E. S. Wallacei (Wallace's). *fl.*, middle lacinia of the lip obcordate, quite entire and very narrow; column shorter than in the type. Mountains south of Bogota, 1837.

E. stenopetalum (narrow-petaled). *fl.* rose-coloured, few, produced at the tips of the pseudo-bulbs; lip a little darker than the sepals and petals, having a square, white area at the base, with a small, yellow crest, adhering to the column for quite half the latter's length. West Indies and Central America, 1837. (B. M. 3410.)

E. tampense (Tampa). *fl.* about 1¼in. across, several on a slender scape; sepals and petals yellowish-brown, cuneate-linear; lip white, with more or less confluent purple lines. *l.* linear, 6in. long. Pseudo-bulbs small, ovoid. Florida, 1888. (B. R. 1847, t. 35.)

E. tibicinis (cow-horn). A synonym of *Schomburgkia tibicinis.*

E. tovarense (Tovar). *fl.* milk-white; sepals and petals linear-spathulate; side lobes of lip almost quadrate, the mid-lobe emarginate; peduncle 6in. to 8in. long, few-flowered. *l.* oval-oblong, 4in. to 5in. long. Stems erect, 9in. to 12in. high, as thick as the little finger. Tovar, Venezuela, 1850.

E. trachychilum (rough-lipped). *fl.* very leathery, disposed in a dense, much-branched panicle; sepals and petals olive-brown, the sepals oblong, much-spreading, the petals somewhat conformed; lip deep yellow, studded with red warts, white and spotted pink on the callus, brilliant green with red warts on the lower lobes. *l.* straight, ensiform, much shorter than the scape. Pseudo-bulbs elongated, two-leaved. Mexico, 1835. Greenhouse. (R. G. 1205.)

E. tricolor (three-coloured). *fl.* clear yellow, small, numerous, with a Cucumber-like odour. *l.* 4in. long. Stems about 5in. high. Venezuela, 1893. Allied to *E. parum.*

E. variegatum (variegated). *fl.* fragrant, 1in. to 1¼in. across; sepals and petals pale yellow, or sometimes yellowish-green blotched with purplish-brown; lip bright rose-colour, or white spotted with rose, very short, cordate, acute; racemes longer than the leaves, many-flowered. *l.* oblong-lanceolate, 6in. to 9in. long. Stems fusiform, 6in. to 9in. high, two- or three-leaved. South America, &c., 1832. (B. M. 3151; B. R. 1839, t. 11.)

E. v. coriaceum (leathery). *fl.* light yellow, spotted with reddish-brown; lip paler than the sepals and petals. *l.* broader, shorter, and more leathery. Stems shorter and thicker. (B. M. 3595, under name of *E. coriaceum.*)

E. verrucosum (warted). *fl.* in a spreading panicle; sepals and petals greenish-yellow; lip three-lobed, the side lobes creamy-white, the front lobe yellow, with a bright violet spot at base. Spring and summer. *l.* lanceolate or oblong-lanceolate. Stems leafy, 1½ft. to 4ft. high. Jamaica, 1825.

E. vitellinum flore-pleno (double-flowered).* This is described as having "perfectly regular flowers formed of twelve segments." 1890. The typical plant is shown in Fig. 369.

E. v. giganteum (gigantic). A synonym of *E. v. majus.*

E. Wallisii (Wallis').* *fl.* numerous, about 1¼in. across, scented; sepals and petals golden-yellow, spotted carmine-crimson, ligulate-oblong; lip white, with radiating, tubercled lines of magenta-purple, broad, cuneately flabellate; racemes drooping. October and November. *l.* distichous. Stems several feet in height, spotted brownish-purple, leafy. Colombia, 1874. (W. O. A. ii., t. 74.)

E. Watsonianum (Watson's). A new species, allied to *E. Godseffianum.*

E. Wendlandianum (Wendland's). *fl.* nearly 2in. in diameter, sepals and petals light green; lip snow-white, with dark purplish lines on the side lobes; stalks one- to three-flowered. Mexico, 1893. Cool-house.

E. xanthinum (yellow).* *fl.* yellow, sometimes tinted with orange, disposed in a dense head, on a peduncle nearly as long as the stems; sepals and petals acute; lip three-lobed, fringed. *l.* oblong-lanceolate, 3in. to 4in. long. Stems 1½ft. or more in length, as thick as a goose-quill, leafy throughout. Minas Geraes, about 1839. (B. M. 7586.)

Epidendrum—*continued.*

E. xipheroides (resembling *E. xipheres*). *fl.* few in a slender raceme; sepals and petals green, with purple lines; lip yellow, with a thick, white callus. *l.* linear, thick, 8in. long, ½in. wide. Pseudo-bulbs large, pear-shaped, two-leaved. Brazil, 1896.

In addition to the above, a large number of species are in cultivation at Kew and one or two other establishments, but they have little or no horticultural value.

This somewhat despised section of Orchids has been of considerable value to the hybridist. The intercrossing of some of the showiest species has produced excellent results. By far the most interesting have been those instances where *Epidendrum* has been used as one of the parents in the production of bigeneric hybrids, from which such names as *Epi-Cattleya*, *Epi-Lælia*, and *Epiphronitis* are derived.

We append a list of *Epidendrum* hybrids, with their parentage:

Berkeleyi	*Stamfordianum* and *O'Brienianum* (Berkeley).
*Clarissa**	*elegantulum* and *Wallisii* (Veitch).
dellense	*xanthinum* and *radicans* (Schröder).
*elegantulum**	*Endresio-Wallisii* and *Wallisii* (Veitch).
*elegantulum leucochilum**	*Endresio-Wallisii* and *Wallisii* (Veitch).
*elegantulum luteum**	*Endresio-Wallisii* and *Wallisii* (Veitch).
*Endresio-Wallisii**	*Endresii* and *Wallisii* (Veitch).
*Endresio-Wallisii superbum**	*Endresii* and *Wallisii* (Veitch).
*James O'Brien**	*E. O'Brienianum* (Veitch).
*langleyense**	*pseudepidendrum* and *Wallisii* (Veitch).
*O'Brienianum**	*erectum* and *radicans* (Veitch).
*O'Brienianum roseum**	*evectum* and *radicans* (Veitch).
orphanum	= *Endresio-Wallisii* (Sander).
Phœbus	*O'Brienianum* and *vitellinum* (Veitch).
radicanti-Stamfordianum	*Stamfordianum* and *radicans* (Veitch).
radico-vitellinum	*vitellinum* and *radicans* (Veitch).
*Wallisio-ciliare**	*ciliare* and *Wallisii* (Veitch).
xantho-radicans	*xanthinum* and *radicans* (Sir T. Lawrence).

FIG. 369. EPIDENDRUM VITELLINUM, showing Habit and detached Flower.

EPIGÆA. Flowers white or pink, fragrant, sessile; calyx three-bracted; sepals five; corolla salver-shaped, with five imbricated lobes. Leaves alternate, shortly petiolate.

EPIGÆAN, EPIGEOUS. Growing close to the ground; growing on land as distinguished from water.

EPIGYNIUM ACUMINATUM. A synonym of **Corallobotrys acuminata** (which *see*).

EPI-LÆLIA. ORD. *Orchideæ*. Bigeneric hybrids derived from the intercrossing of *Epidendrum* and *Lælia*. For cultural requirements, *see* **Epi-Cattleya.**

The following is a list of hybrids, together with their recorded parentage :

Charlesworthii	*E. radicans* and *L. cinnabarina* (Charlesworth).
Hardyana	*E. ciliare* and *L. anceps* (Sander).
Heatonensis	*E. Wallisii* and *L. cinnabarina* (Charlesworth).
radico-purpurata	*E. radicans* and *L. purpurata* (Veitch).

EPILINELLA. A synonym of **Cuscuta** (which *see*).

EPILOBIUM. Including *Chamænerium*. Calyx-limb four-parted, deciduous ; petals four, obovate or obcordate, erect or spreading ; stamens eight, the alternate ones rather shorter. To the species described on p. 145, Vol. I., the following should be added :

E. Fleischeri (Fleischer's). A synonym of *E. Dodonæi*.

E. glabellum (nearly glabrous). *fl.* pink, ¼in. to ½in. across, disposed in the upper axils. *l.* in rather scattered pairs, sessile or shortly petiolate, ¼in. to ⅝in. long, oblong, ovate- or lanceolate-oblong, obtusely sinuate-toothed, sometimes shining. Stem erect, 6in. to 12in. high, or decumbent. New Zealand.

E. longipes (long-stalked). A synonym of *E. pedunculare*.

E. nummularifolium (Moneywort-leaved). *fl.* pink or whitish, very small ; peduncles axillary, slender, ½in. to 4in. long. *l.* two to four lines long, sessile or petiolate, numerous, opposite, rather crowded, orbicular or oblong, obtuse, flat or convex. Branches 2in. to 6in. long, glabrous or pubescent. New Zealand. Plant prostrate, hardy.

E. pedunculare (pedunculate). *fl.* pink or whitish, very small ; peduncles axillary, slender, as much as 4in. long. *l.* membranous, ¼in. to ½in. long, sessile or petiolate, numerous, opposite, rather crowded, orbicular or oblong, obtuse. New Zealand. Plant small, prostrate. SYN. *E. longipes*.

E. rosmarinifolium is a form of *E. Dodonæi*.

EPIMEDIUM. This genus embraces about eight species, natives of Europe and temperate Asia. Alike for flowers and foliage these elegant spring-flowering plants are appreciated. The latter is very ornamental, being frequently of a coppery-bronze hue in combination with a pretty colour, and then it makes good material for vases. The species will thrive almost anywhere and in any soil, and all are readily propagated by divisions in late summer. To those described on p. 515, Vol. I., the following should be added. *E. diphyllum* is now classed as a separate genus, **Aceranthus** (which *see*).

E. sagittatum (arrow-shaped). *fl.* numerous, ½in. in diameter ; inner sepals white ; petals yellow. *l.* biternate, 1½ft. to 2ft. long ; leaflets nine, cordate-ovate or hastate, very firm, 3in. to 6in. long, the edge fringed with horny teeth, the lower surface sometimes densely pilose ; petioles 1ft. long. Japan and China.

E. sinense (Chinese). A synonym of *E. sagittatum*.

E. versicolor (various-coloured). A synonym of *E. macranthum*.

E. violaceum (violet). A synonym of *E. macranthum*.

EPIPACTIS. One or two species formerly included in this genus are now classed under **Cephalanthera.** To those described on p. 515, Vol. I., the following should be added :

E. atrorubens (dark red). *fl.* and ovaries dark purple ; lip ovate, acute or slightly hollowed. July to September. *l.* like those of *E. latifolia*, often reddish. *h.* 8in. to 12in. France, &c. SYN. *E. latifolia rubiginosa*.

E. cucullata (hooded). A synonym of *Eriochilus autumnalis*.

E. latifolia rubiginosa (reddish). A synonym of *E. atrorubens*.

EPIPHANES (of Blume). A synonym of **Gastrodia** (which *see*).

EPIPHRONITIS. ORD. *Orchideæ*. This most interesting, useful, and beautiful bigeneric hybrid is the result of the intercrossing of *Epidendrum radicans* with *Sophronitis grandiflora*. It is a most desirable addition to the Orchid family, and its qualities are such as to merit a place in every collection of Orchids. It has the intermediate characteristics of the two parents in the flowers. The durability of these and their bright colour render

Epiphronitis—*continued.*

them most useful for arranging with other plants and for cut-flower purposes.

The cultural requirements are a light position on the stage of the warm intermediate house, and a liberal amount of moisture both at the root and in the atmosphere during the growing season. More friable conditions should be afforded during the resting period. The potting material should consist of equal proportions good fibrous peat and living sphagnum moss. Shallow pans are the most suitable receptacles ; these should have ample drainage, and should be sufficiently large to receive the somewhat straggling roots, which are produced at the base of the last made growth. Aërial roots are also produced from the nodes at intervals higher up the stem, as in the *Epidendrum* parent. These need not be interfered with except it is desirable to increase the stock. This may be done by cutting the stems asunder just below where the root has been emitted, and potting them up in the usual way. They should have a thorough watering with soft rain-water as soon as they have been repotted, and every encouragement must be given to induce and encourage free growth. If the plants are removed to a cool, airy house after the flowers have become expanded, they last in perfection for several weeks.

Epiphronitis Veitchii ..	*Epidendrum radicans* and *Sophronitis grandiflora* (Veitch).

EPIPHYLLUM. This genus now embraces about half-a-dozen species. Epiphyllums require an intermediate house in winter, whilst, in summer, any position where they can be kept a little close and moist, and be shaded from bright sunshine, will suit them. Some growers recommend placing these plants in a hot, dry house ; but we have never seen good specimens cultivated under such conditions. All through the summer months the plants should be syringed both morning and evening ; but by the end of August they will have completed their growth, and should therefore be gradually exposed to sunshine and air. It is advisable to discontinue the use of the syringe from September till the return of spring, but the plants should always be kept supplied with a little moisture at the root and in the air about them during the winter months. In this respect, these plants and the *Rhipsalis* are exceptions among Cactuses, as all the others are safest when kept dry during the cold, dull weather between September and April.

When grown on their own roots, Epiphyllums are useful for planting in wire baskets intended to hang near the glass ; large and very handsome specimens form in a few years, if young rooted plants are placed rather thickly round the sides of the basket, and grown in a warm house. Epiphyllums are employed with good effect for covering walls, which are first covered with peaty soil by means of wire netting, and then cuttings of the Epiphyllums are stuck in at intervals of about 1ft. A wall clad with the drooping branches of these plants is attractive even when without their beautiful flowers ; but when seen in winter, with hundreds of sparkling blossoms, they present a most beautiful picture. Large plants of *Pereskia* may be trained over pillars in conservatories and afterwards grafted with Epiphyllums ; in fact, there are many ways in which these plants may be effectively employed in gardens.

To those described on p. 517, Vol. I., the following should be added :

E. Gærtneri (Gærtner's).* *fl.* brilliant scarlet, shaded with violet, very showy, terminal, twin ; calyx short, pilose at base ; petals narrow-lanceolate, acuminate, spreading-recurved. April. Joints of the stem 2in. to 3in. long, 1½in. broad, truncate, crenate, the crenatures hairy. Brazil, 1838. (B. M. 7201.) *E. Gærtneri* is an interesting and beautiful hybrid, raised from an *Epiphyllum* and a *Cereus* of some kind. The branchlets are exactly the same as those of *E. truncatum*, but the flowers are not like an *Epiphyllum* at all, resembling rather those of a *Cereus* or a *Phyllocactus*. SYNS. *E. Makoyanum* (J. H. 1839, p. 352), *E. Russellianum Gærtneri* (R. H. 1837, p. 516).

E. Gibsoni (Gibson's). *fl.* two to four, of a beautiful, dark orange-red, produced at the ends of the branches, having some straight hairs at their base. 1836. This plant closely resembles *E. truncatum*.

E. Guedeneyi (Guedeney's).* *fl.* large ; outer petals white, slightly tinged with sulphur ; the others pure creamy-white ; stamens much shorter than the petals. Stems very broad, thin, with roundish, shallow notches. Probably of garden origin.

E. Makoyanum (Makoy's). A synonym of *E. Gærtneri*.

E. Phyllanthus (leaf-flowering). A synonym of *Phyllocactus Phyllanthus*.

Epiphyllum—*continued.*

FIG. 370. FLOWER OF EPIPHYLLUM RUSSELLIANUM.

E. Russellianum. This is easily distinguished from *E. truncatum* by its smaller branchlets. A flower is shown in Fig. 370.

E. R. Gærtneri (Gærtner's). A synonym of *E. Gærtneri.*

E. truncatum. The following are additional varieties: *Bridgesii*, tube violet, petals dark purple; *cruentum*, tube purplish-scarlet, petals bright scarlet; *tricolor*, tube salmon-red, petals red, centre purplish.

Varieties. The following varieties, in addition to those named in Vol. I., p. 517, may be named: BRIDGESII, tube violet, petals dark purple. CRUENTUM, tube purplish-scarlet, petals bright scarlet. TRICOLOR, tube salmon-red; petals red, centre purplish.

EPIPHYLLUM (of Haworth). A synonym of **Phyllocactus** (which *see*).

EPIPREMNUM. SYN. *Raphidophora. E. mirabile* is at present the only species in cultivation.

EPISCIA. Calyx free, deeply five-cleft or five-parted, the lobes or segments entire or rarely toothed; corolla having five rounded, spreading lobes. To the species described on p. 517, Vol. I., the following should be added. *See also* **Centrosolenia.**

E. cupreata metallica (metallic). *fl.* of an orange-scarlet tint. Colombia, 1869.

E. densa (dense). *fl.* pale straw-coloured; corolla nearly 2in. long, slightly decurved, hairy, the lobes very short; racemes crowded on the arrested nodes of the stem, very short. October. *l.* few, crowded, 6in. to 10in. long, ovate-oblong, cuneate, rounded, or nearly cordate at base, bright blood-red beneath; petioles stout, 3in. to 4in. long. Stem short. Demerara, 1895. (B. M. 7481.)

E. maculata (spotted).* *fl.*, corolla yellow, spotted with brown, 2in. long, remarkable in having one of the corolla lobes folded inwards and forming a lid-like valve to the tube; cymes axillary, rather dense. September. *l.* ovate, 3in. to 6in. long, more or less recurved, paler beneath. Stems fleshy, trailing. British Guiana, 1890. A beautiful stove plant. (B. M. 7131.)

E. punctata (dotted). The correct name of *Drymonia punctata.*

E. tessellata (tessellated). The correct name of *Centrosolenia bullata.*

E. Luciani (I. H. 1876, t. 236), *E. pulchella*, and *E. splendens* have also been introduced.

EQUAL. Resembling something else in all respects or in length only; regular; symmetrical.

EQUINOCTIAL. A term applied horticulturally to flowers that open and close at regular, stated intervals.

ERAGROSTIS. Spikelets few- or many-flowered, compressed; lower palea three-nerved, neither hairy nor woolly, the upper one remaining after the rest of the flower has fallen. Leaves and sheaths smooth or hairy. Culms often branched. This genus is allied to *Poa.*

ERANTHEMUM. Flowers white, pink, red, or lilac, variously disposed; calyx deeply five-cleft, the segments short, narrow, sub-equal; corolla tube elongated, the limb spreading, five-partite; stamens two. Leaves entire, or rarely deeply toothed. To the species described on p. 518, Vol. I., the following should be added. Others formerly classed hereunder are now referred to **Chamæranthemum, Dædalacanthus, Fittonia,** and **Thyrsacanthus.**

E. albiflorum (white-flowered). *fl.* snow-white, oppositely fascicled; corolla ½in. long; spike (with the peduncle) 6in. to 12in. long, erect. July. *l.* oval-oblong, shortly cuspidate, cuneate at base, sessile, 4½in. to 5½in. long, lined on both sides. Stems 3ft. high. Brazil. (B. M. 4225.)

E. borneënse (Borneo). *fl.* crowded round the rachis, forming a conical inflorescence; calyx ½in. long; corolla white, with a faint tinge of lemon, the tube 1in. long, cylindric, the limb 1½in. in diameter, obscurely two-lipped, quite flat; spike 4in. to 6in. long; peduncle stout, erect. *l.* 4in. to 6in. long, shortly petiolate, ovate-oblong, acuminate, entire, rounded or acute at base, glabrous, studded with raphides. Borneo, 1882. A nearly glabrous shrub. (B. M. 6701.)

E. hypocrateriforme (salver-shaped). *fl.* red, approximating; corolla tube 1½in. long, the limb nearly salver-shaped; spike terminal, 2in. to 3in. long; bracts bristly. *l.* ovate, attenuated at both ends, 1½in. long, highly glabrous. Branches glabrous, acutely tetragonal. Western tropical Africa, 1879. (B. M. 6181.)

E. indicum (Indian). According to C. B. Clarke, in the "Flora of British India" (iv. 497) this is the correct name of *Thyrsacanthus indicus.* SYN. *Asystasia Thyrsacantha.*

E. palatiferum (palate-bearing). A synonym of *E. cinnabarinum.* (B. M. 5957, right-hand figure.)

E. Parishii (Parish's). The correct name of *E. crenulatum grandiflorum* (B. M. 5440).

E. roseum (rosy). *fl.* of a pretty, deep rose-colour; corolla tube ¾in. long, the limb small; spike slender, terminal. *l.* ovate, acute, 4in. long, 2½in. broad, deep green above, with scattered golden powdering, blush-pink beneath; petioles 2in. long. Amazons, 1874. (I. H., 1876, t. 235.)

E. velutinum (velvety). *fl.* of a deep rose-pink, in long spikes; tube slender, curved, 1in. long. *l.* deep velvety olive-green, bullate. 1886. A distinct and pretty shrub.

E. verbenaceum (Verbena-like). *fl.* white, opposite; corolla tube twice as long as the calyx; spike terminal, simple or trifid. *l.* oblong, cuneate-attenuated at base, decurrent into the petioles, silvery-lined on both sides, glabrous. Stem 1ft. to 2ft. high. Bahia, 1862.

In addition to the above species, the following garden plants may be named: *eboracense*, flowers white; *marmoratum* (R. G. t. 536, f. 2); *nigrescens*, leaves blackish-purple; and *nigrum*, leaves purplish (I. H. n.s., t. 404).

ERANTHIS. *E. cilicica* is a comparatively recent introduction to commerce, and even now is far from being abundant. From the well-known *E. hyemalis* it chiefly differs in being deeper as to colour, later in flowering, and in not being so pretty as to "collar." Nor is it so robust of constitution. For all that it should be included in the early spring garden.

ERCILLA. SYNS. *Apodostachys, Bridgesia.* This genus, which is closely allied to *Phytolacca*, now embraces two species, natives of Peru and Chili. Leaves alternate, petiolate, thickly coriaceous.

For planting in dry soils, *E. spicata* is well adapted. Cuttings of young shoots root freely if taken off in July and inserted in light soil on a warm border, and covered with a hand-light.

ERECTO-PATENT. In a position intermediate between erect and spreading.

EREMÆA (from *eremos*, solitary; in allusion to the solitary style, or female organ). ORD. *Myrtaceæ.* A small genus (five species) of greenhouse, bushy shrubs, closely allied to *Calothamnus*; they are restricted to Western Australia. Flowers sessile, solitary or few, surrounded by imbricated bracts. Leaves alternate, flat and Heath-like. *G. fimbriata* and *G. pilosa* (SYN. *G. ericifolia*) have been introduced, but it is doubtful if they are now in cultivation.

EREMOPHILA (from *eremos*, solitary, and *phileo*, to love; in allusion to the plants being found in deserts). ORD. *Myoporineæ.* A genus embracing nearly forty species of stove shrubs or trees, all Australian. A few of the species have been introduced, and two are described on p. 497, Vol. III., under **Stenochilus,** which modern authorities class under *Eremophila.*

EREMOSTACHYS. According to Sir J. D. Hooker, twenty-seven species, all natives of Western Asia, are included in this genus. Calyx teeth five; corolla tube included; stamens four.

EREMURUS. SYNS. *Ammolirion, Henningia.* These stately plants, with their enormous spikes of flowers, are worthy of the attention of the hardy plant lover. All

FIG. 371. EREMURUS HIMALAICUS.

are fairly hardy, and will thrive in good, well-drained soil. Their greatest enemy is frost in spring, followed by warm sun and cutting winds. This should be studied at planting time. Eremuruses are best planted in autumn, and they should be disturbed as little as possible. Increased

Eremurus—*continued.*

by division in autumn. *E. himalaicus* (Fig. 371, for which we are indebted to Messrs. Veitch and Sons) is one of the dwarfest of the genus. To the species described on p. 519, Vol. I., the following should be added:

E. Aitchisoni (Aitchison's).* *fl.* pale reddish, disposed in dense spikes. June. Stems 3ft. to 5ft. high. Afghanistan (on high mountains). A grand species, closely allied to *E. robustus.*

E. aurantiacus (orange). A synonym of *E. Bungei.*

E. bucharicus (Bokhara).* *fl.* white, about 1in. in diameter, disposed in a long and rather lax raceme; perianth segments marked with a brownish-red median line. *l.* triquetrous, glaucous, retrorsely serrulate-scabrous on the margin and keel. Stem about 3ft. high. Bokhara, 1890. (R. G. 1890, t. 1315, f. 1.)

E. Bungei (Bunge's).* *fl.*, perianth bright yellow, ½in. long; pedicels erecto-patent; raceme oblong, dense, 4in. to 5in. long; scape terete, 1ft. long, glabrous. *l.* linear, 1ft. long, less than ½in. broad, firm, glabrous, the edges minutely ciliated. Persia, 1885. (R. G. 1168, a.) SYN. *E. aurantiacus* (R. G. 1168, b, g, h).

E. Elwesii (Elwes').* *fl.* of a beautiful pink, very numerous, pedicellate; stem as much as 9ft. high. *l.*, radical ones 3ft. long, fleshy. Origin not recorded, 1897. Allied to *E. robustus* (of which it is probably a variety), but much earlier. (R. H. 1897 p. 290.)

ERIA. SYNS. *Dendrolirium, Octomeria* (of Don), *Pinalia.* Including *Porpax* (of Lindley), *Mycaranthus,* and *Trichotsia.* This is perhaps the most polymorphic genus of Orchids, and no less than ninety-four representatives are found in British India. To the species described on p. 519, Vol. I., the following should be added:

E. bicolor (two-coloured). *fl.* pure white, with pubescent, purple ovaries and rachis, borne in one-sided racemes; bracts white. *l.* five to seven, cuneate-lanceolate, stiff, 4in. to 5in. long. Stems 4in. to 5in. long, very tumid at base. Ceylon, 1888. A pretty species.

E. bigibba (twice-gibbous). *fl.*, sepals and petals light reddish, lanceolate, the sepals with green median nerves; lip whitish, with small, purple dashes at base, transversely trifid; column yellowish-white, purple at the base inside. *l.* long, petiolate, on a tumid, cylindraceous foot. Borneo, 1884.

E. carinata (keeled). *fl.*, sepals light yellowish-green, 1in. long, keeled at back; petals yellowish-green; lip deep, dull yellow, veined crimson, narrow-oblong, obtuse, with small, rounded lateral lobes; racemes terminal, two- or three-flowered. *l.* linear-lanceolate, acute, 8in. to 9in. long. Pseudo-bulbs ovoid, smooth. Hong Kong, 1886. SYN. *E. Fordii.*

E. cinnabarina (cinnabar-coloured). *fl.* of a rich cinnabar-orange, about 1in. in diameter; bracts lanceolate; racemes 4in. long, about six-flowered. *l.* 6in. long. Pseudo-bulbs 1in. long. Borneo, 1894. (L., t. 443.)

E. coronaria (crowned). A synonym of *Trichosma suavis.*

E. cristata (crested). *fl.*, sepals and petals pure white; lip yellow, somewhat darker on the disk and margins of the side lobes; column white, with a yellow anther-case. Moulmein, 1882. A pretty little species.

E. Elwesii (Elwes'). A synonym of *E. Meirax.*

E. Fordii (Ford's). A synonym of *E. carinata.*

E. Laucheana (Lauche's). *fl.* green and purple, disposed in a drooping raceme. 1892.

E. lineoligera (line-bearing). *fl.* white, very thin; sepals and petals acute, curved; lip cuneate-dilated, trifid, the side laciniæ triangular, very short, the middle one projecting, triangular, undulated, with purple lines on each side; raceme ascending, with orange bracts. *l.* rather thick, cuneate-oblong-lanceolate. Pseudo-bulbs fusiform. Siam, 1885.

E. marginata (margined). *fl.* 1in. in diameter; sepals and petals white, flushed with pink; lip pale yellow, margined with red; bracts yellow, large; scape ½in. long, two-flowered. *l.* and stem each 3in. long, the latter clavate. Birma, 1889. (B. M. 7238.)

E. Meirax (Meirax). *fl.* light brown, small; outer perigone connate, three-toothed; petals rhomboid; lip oblong, retuse, with two rounded lobes at base. *l.* nearly 1in. long, stalked, oblong, acute. Pseudo-bulbs depressed, covered with fibrous sheaths. 1885. A tiny plant. (B. M. 7329.) SYN. *E. Elwesii.*

E. monostachya (one-spiked). *fl.*, sepals and petals greenish-yellow; lip having a very small anterior lacinia, and two angular calli between the sinuses between the lateral and anterior laciniæ; inflorescence simple. Java, 1885.

E. muscicola (Moss-growing). *fl.* yellowish-green, very small, racemose. *l.* about ½in. long. Pseudo-bulbs racemose. Ceylon, 1887. An insignificant species.

E. rhodoptera (red-winged). *fl.*, sepals whitish-ochre, as well as the pedicels, ovaries, and bracts; petals purple, ligulate, broad; lip trifid, the lateral segments purple, produced, the middle one ligulate, retuse, emarginate; raceme elongated. *l.* linear-ligulate, acute. Stems cylindrical. 1882.

Eria—*continued.*

E. Rimanni (Riman's). *fl.* of a pellucid, pale yellow, the front lobe of the lip golden-yellow, with two purple spots; raceme nodding, dense, with a few reddish hairs. *l.* cuneate-oblong, acute, very leathery, light green, with dark nerves. Pseudo-bulbs pyriform, about 3in. long. Birma, 1885.

FIG. 372. ERICA CAVENDISHIANA.

E. striolata (slightly striated). *fl.*, sepals and petals light ochre-coloured, linear-ligulate, acute, the former marked with three stripes and the latter with one stripe of reddish-purple; lip ligulate, with very blunt side lobes, and three conspicuous, partly crenulate, yellow keels; raceme dense-flowered, the rachis only slightly hairy. *l.* cuneate-oblong, acute, very fleshy. Papuan Islands, 1883. (I. H. 1883, t. 48.)

E. suavis (sweet). A synonym of *Trichosma suavis.*

In addition to the above, a large number of species of no horticultural value are cultivated at Kew and in other botanical gardens.

ERIANTHUS. Spikelets spiked in pairs upon each joint of the slender rachis, one of them sessile, the other pedicellate; grain free; spikes crowded in a panicle, and clothed with long, silky hairs, especially in a tuft at the base of each spikelet. *E. Monsteirii*, a hardy species from Mount Olympus, has also been grown in Continental gardens.

ERICA. Including *Pachysa* and *Syringodea.* Five species are included in the British Flora, viz.: *E. carnea*

FIG. 373. ERICA PROPENDENS.

Erica—*continued.*

(Mediterannean Heath), *E. ciliaris* (Ciliated Heath), *E. cinerea* (Scotch Heath, Scotch Heather), *E. Tetralix* (Cross-leaved Heath), and *E. vagans* (Cornish Heath). The Hardy Heaths form a most useful group by reason of their robustness, compactness of growth, length of flowering period, as well as the time they last in perfection. Popularly they are supposed to thrive only in peaty soils; but this is a mistake. They will grow almost equally well in loam, so long as lime is absent. For the rock garden, and edgings to beds, they are well suited, and will yield their blossoms in profusion each season if a top-dressing of leaf-mould be given. *E. carnea* is particularly valuable on account of producing its flowers in mid-winter; and this and its white variety *alba* should always be represented. By a judicious selection of species the hardy section of Ericas may be found in blossom practically the year through.

Of Heaths very largely grown for market, the lovely yellow *E. Cavendishiana* (Fig. 372) is one of the most popular. Free flowering and also extremely beautiful are *E. ventricosa* and its varieties (Figs. 375 and 376); while other especially desirable kinds are the hybrids *E. Spenceriana* (Fig. 374) and *E. propendens* (Fig. 373), all of which were described in the work proper.

To the species and varieties described on pp. 520-6, Vol. I., the following should be added:

E. cerinthoides coronata (crowned). *fl.* deep scarlet-vermilion. 1895. A handsome, dwarf variety.

E. coronaria (crowned). A garden synonym of *Blæria ericoides.*

E. corsica (Corsican). A synonym of *E. stricta.*

E. hyemalis alba (white). This variety differs from the type only in having pure white flowers. 1882.

E. Mackaiana (Mackay's). A form or synonym of *E. Tetralix.*

FIG. 374. ERICA SPENCERIANA.

Erica—*continued.*

FIG. 375. ERICA VENTRICOSA.

E. Maweana (Mawe's). *fl.* purplish-crimson, produced in clusters, after the manner of those of *E. Tetralix* and *E. ciliaris*. Autumn. Stems sub-erect, much-branched, forming soft, ornamental bushes, 1ft. to 1½ft. high. 1882. Hardy. Probably a hybrid.

E. Mooreana (Moore's).* *fl.* in large, terminal umbels of a dozen or more; corolla bright, glossy crimson-red, with a ring of black at the mouth, ventricosely tubular, above 1in. long, the lobes pink, roundish; pedicels red, with gland-bordered bracts. *l.* in whorls of four, very much recurved, fringed with twisted ciliæ, and tipped with a long awn. 1882. Hybrid.

E. orbicularis (orbicular). A synonym of *Blæria ericoides*.

E. sicula (Sicilian). A synonym of *Pentapera sicula*.

E. vulgaris (common). A synonym of *Calluna vulgaris*.

E. Wilmoreana. Of this species there are several varieties, including *calyculata*, *glauca*, and *superba*.

The following changes of nomenclature have been made by modern botanists:

E. alopecuroides	is a form of, or synonymous with,	*E. nudiflora.*
E. Bonplandiana	,, ,,	*E. Muscari.*
E. caffra	,, ,,	*E. persoluta.*
E. codonodes	,, ,,	*E. lusitanica.*
E. densa	,, ,,	*E. ventricosa.*
E. echiiflora	,, ,,	*E. coccinea.*
E. Ewerіana	,, ,,	*E. Uhria.*
E. eximia	,, ,,	*E. aristella.*
E. ferruginea	,, ,,	*E. squamosa.*
E. gemmifera	,, ,,	*E. Massoni.*
E. grandinosa	,, ,,	*E. formosa.*
E. Hartnelli	,, ,,	*E. crinita.*
E. infundibuliformis	,, ,,	*E. pavettæflora.*
E. jubata	,, ,,	*E. melanthera.*
E. Lambertiana	,, ,,	*E. physodes.*
E. Linnæana	,, ,,	*E. perspicua.*
E. metulæflora	,, ,,	*E. Massoni.*
E. mundula	,, ,,	*E. fastigiata.*
E. ovata	,, ,,	*E. hirtiflora.*
E. Parmentieriana	,, ,,	*E. præstans.*
E. primuloides	,, ,,	*E. fastigiata.*
E. princeps	,, ,,	*E. Massoni.*
E. splendens	,, ,,	*E. tumida.*
E. triumphans	,, ,,	*E. andromedæflora.*
E. trossula	,, ,,	*E. Muscari.*

ERICALA. A synonym of **Gentiana** (which *see*).

ERICOILA. A synonym of **Gentiana** (which *see*).

ERIGERON. Including *Leptostelma*. All the Erigerons in cultivation are worth growing where space can be found for them, either on the rockery or in the front row of a sunny border. They blossom over a long period and until late in the year. The seeds should be sown in early summer outside, and the divisions may be made in either spring or autumn. *E. aurantiacus* is one of the best species grown, being very showy and very dwarf; another excellent kind is *E. speciosus superbus* (3ft.), which blossoms towards the end of summer. The flowers of many kinds are excellent for cutting. To the species described on pp. 526-7, Vol. I., the following should be added. *E. mucronatus* is a very floriferous and pretty border plant. Cuttings should yearly be put into a cold frame, in case the old plants outside are killed during the winter.

E. alpinus (alpine). *fl.-heads* purple, solitary or corymbose; rays rarely exceeding the reddish pappus. Summer. *l.*, radical ones petiolate, spreading, obovate or oblong-obovate; cauline ones usually sessile, obovate or oblong. *h.* 1ft. Europe (Britain), &c. Hardy perennial.

E. a. grandiflorus (large-flowered).* *fl.-heads* purplish, large. Late summer. A fine rockery plant.

E. a. semibarbatus (half-bearded). *fl.-heads* 2in. to 3in. in diameter; rays twice as long as the pappus, the tube furnished with long hairs. *l.*, cauline ones half-amplexicaul or narrowed at base. Western Himalayas, &c. Probably *E. Roylei* is synonymous with this.

E. atticus (Attic). A synonym of *E. Villarsii*.

E. bellidifolius (Bellis-leaved). *fl.-heads* bluish-purple, few, corymbose, larger than in *E. philadelphicum*; rays about fifty, much broader. March and April. *l.*, radical ones clustered, 2in. to 3in. long, obovate or broadly spathulate, serrated or entire; cauline ones oblong or lanceolate-oblong, partly amplexicaul. *h.* 9in. to 20in. North America, 1790. Hardy perennial. (B. M. 2402.)

E. caucasicus. The correct name is *E. pulchellus*.

E. glabellus mollis (soft). *fl.-heads* rose-coloured, large Colorado, 1896. Plant pubescent.

FIG. 376. ERICA VENTRICOSA COCCINEA MINOR.

Erigeron—*continued.*

E. hybridus roseus (pink hybrid). A garden hybrid between *E. aurantiacus* and *E. Villarsii.* 1896. (I. H. 1896, p. 301, f. 26.)

E. macranthus (large-flowered).* *fl.-heads* blue or purple, with a yellow eye, few on simple peduncles, but freely produced, smaller than in *E. speciosum.* August. *l.* thickish, reticulated, glabrous, with hispid-ciliated margins, obtuse; upper ones about 1in. long and ¼in. broad. Stem leafy to the summit. North America. Hardy perennial.

E. maximus (largest). *fl.-heads* purplish, solitary at the tips of the peduncles; rays in two series. Summer. *l.* amplexicaul, dentate-serrated; radical ones long-lanceolate; upper ones cordate-lanceolate, acuminate. Mexico, 1830. Half-hardy perennial. SYN. *Leptostelma maximum* (S. B. F. G., ser. ii., t. 38.)

E. mucronatus (mucronate).* *fl.-heads* pedunculate; involucral scales linear, subulate, puberulous; rays white, biseriate, twice as long as the disk. Summer and autumn. *l.* lanceolate, attenuated at base, ciliated, entire, or lobed or toothed above the middle. *h.* 6in. to 12in. Stem terete, branched. Mexico. Half-hardy perennial. SYN. *E. quercifolius.*

E. philadelphicus (Philadelphian). *fl.-heads* pale reddish-purple or flesh-coloured, rather small, corymbose; rays innumerable. June to August. *l.* membranous, ciliated; lowermost ones spathulate, oblong, tapering to a slender base or margined petiole, the midrib whitish; upper ones amplexicaul and mostly cordate at base. *h.* 1ft. to 2ft. North America, 1778. Hardy perennial.

E. pulchellus (rather pretty). The correct name of *E. caucasicus.*

E. quercifolius (Oak-leaved). A synonym of *E. mucronatus.*

E. Roylei is probably identical with *E. alpinus semibarbata.*

E. salsuginosus (salt-marsh-loving). The correct name of *Aster salsuginosus.*

E. speciosus superbus (superb).* A fine garden variety, with much larger blossoms than in the type, and freely produced. 1889. (Gn. xxxvi., p. 377.)

E. strigosus (strigose).* *fl.-heads* white, in loose corymbs; rays about twice the length of the involucre. June to August. *l.* entire or slightly serrated; lower ones ovate or spathulate; upper ones scattered, lanceolate, oblanceolate, or linear. *h.* 1ft. to 3ft. North America. Hardy annual or biennial.

E. Villarsii (Villars').* *fl.-heads* purple; rays twice as long as the disk. July. *l.* lanceolate, scabrid, sessile. Stem erect, pubescent, racemose at apex; branchlets one-headed, longer than the leaves. *h.* 1ft. Europe, 1804. Hardy perennial. SYN. *E. atticus.*

ERINACEA (from *erinaceus*, a hedgehog; in allusion to the spiny character of the plant). ORD. *Leguminosæ.* A monotypic genus. The species, *E. pungens* (SYN. *E. hispanica*) was formerly classed under **Anthyllis,** and will be found under the name *A. Erinacea* on p. 87, Vol. I. Calyx membranous, with short teeth; petals long-clawed, the lower claw adnate to the staminal tube; peduncles two- or three-flowered; bracts and bracteoles small, leafy. Pods oblong, glandular-villous, two-valved. Leaves silky, one-foliolate or digitately trifoliolate. Branches often leafless.

ERINEUM PADI. *See* **Plum—Insect Pests.**

ERINEUM TILIACEUM. *See* **Tilia—Insects.**

ERINEUM VITIS. *See* **Vine—Animal Pests.**

ERINUS. About eight species are now referred to this genus, mostly natives of South Africa. *E. lychnideus* is now referred to **Zaluzianskia.**

ERIOCALIA. A synonym of **Actinotus** (which *see*).

ERIOCAMPA LIMACINA. *See* **Sawflies and Slugworms.**

ERIOCAMPA ROSÆ. *See* **Rose Sawflies.**

ERIOCARPHA. A synonym of **Montanoa** (which *see*).

ERIOCAULON. The following are other synonyms of this genus: *Chætodiscus, Electrosperma, Lasiolepis, Leucocephala,* and *Nasmythia.*

ERIOCEPHALUS (from *erion*, wool, and *kephale*, a head; the heads become very woolly after flowering). ORD. *Compositæ.* A genus embracing seventeen species of greenhouse, evergreen, much-branched, rigid, mostly silky or silvery, scented shrubs, confined to South Africa. Flower-heads racemose, umbellate or solitary, sub-globose, heterogamous; ray florets whitish, in one series; disk yellow or purple; involucre double, the outer part consisting

Eriocephalus—*continued.*

of four or five bracts, the inner campanulate, densely woolly. Leaves usually small, often fascicled, entire or rarely three-lobed at apex. Three of the species have been introduced, but the following is the only one now in cultivation. It thrives in a compost of sandy loam and a little peat, and may be propagated by cuttings of young shoots, inserted in sand, under a hand-glass.

E. africanus (African). *fl.-heads* white, umbellate at the tips of the branches. January to March. *l.* opposite or tufted, silky-pubescent, thickish, obtuse, ¼in. to 1in. long, linear or trifid, channelled. 1731. (B. M. 833.)

ERIOCNEMA. *E. ænea, E. marmorata,* and *E. Sanderæ* are synonymous with *Bertolonia marmorata.*

ERIODENDRON. *Ceiba* is synonymous with this genus.

ERIOGONUM. SYN. *Espinosa.* To the species described on p. 527, Vol. I., the following should be added:

E. Haussknechtii (Haussknecht's). This is described as a singular species with yellow flowers, native of the Washington territory. 1891.

E. stellatum is a form of *E. umbellatum.*

E. umbellatum. The variety *Sileri* is an improved form.

ERIOPAPPUS. A synonym of **Layia** (which *see*).

ERIOPHORUM. SYN. *Linagrostis.* To the species described on p. 527, Vol. I., the following should be added:

E. latifolium (broad-leaved). *fl.*, spikelets two to ten or more in a terminal umbel; glumes olive-green, lanceolate. Summer. *l.* few, flat, mostly radical, much shorter than the stem, more or less triangular; those on the stem often very short. Stems tufted, slender, about 1ft. high. Europe (Britain), North America, &c. Some authorities class this as a variety of *E. polystyachion.*

ERIOPSIS. Flowers showy, pedicellate; sepals equal, spreading, free, or the lateral ones connate with the foot of the column in a very short chin; petals similar to the sepals; lip affixed to the foot of the column, shortly incumbent, at length erect, the lateral lobes broad, erect, loosely enfolding the column, the middle one small, spreading, entire or two-lobed; column rather long, incurved; pollen masses two. Leaves usually two, long, ample. To the species described on p. 528, Vol. I., the following should be added:

E. Helenæ (Helen's). *fl.* resembling those of *E. biloba,* but much larger; stems 1½ft. long, many-flowered. *l.* linear-lanceolate. Pseudo-bulbs 16in. high. Peru, 1897. This is described as "without any doubt the prettiest of the genus."

E. Sprucei (Dr. Spruce's). *fl.*, sepals and petals light yellow, the latter with red borders; side lobes of the lip whitish, dotted red, nearly circular, the middle one lemon-yellow, with mauve spots at the base of the broad stalk, transversely elliptic, the disk white, with two acute horns on the middle; raceme long, cylindrical. *l.* cuneate-oblong, acute. Amazons, 1884.

ERIOSPERMUM. This genus now embraces upwards of thirty species. Flowers whitish or tinged with green, yellow, or claret-purple, in simple racemes; perianth campanulate, the segments distinct; stamens six; pedicels solitary. Leaves usually solitary, produced after the flowers. Rootstock large and tuberous. In addition to the species described on p. 528, Vol. I., the following have been introduced, but they are of little horticultural value: *E. albucoides, E. brevipes,* and *E. calcaratum.*

ERIOSTEMON. To the species, &c., described on p. 528, Vol. I., the following should be added:

E. cuspidatus (cusp-pointed). A synonym of *E. myoporoides.*

E. intermedius is synonymous with *E. myoporoides minor.*

E. myoporoides minor (lesser). The correct name of *E. intermedius.*

E. neriifolius is identical with *E. myoporoides.*

E. obovalis (obovate). *fl.* rather smaller than in *E. buxifolius*; pedicels axillary, one-flowered. *l.* obcordate, obovate, or oblong-spathulate, very obtuse or truncate, rarely attaining ½in. in length, much narrowed at base and often petiolate. *h.* 2ft. to 3ft. New South Wales, &c. Of this species there is a double-flowered form, *flore-pleno* (G. C. 1888, iii., p. 85).

E. pulchellus (rather pretty). A garden hybrid.

ERIOSTOMUM. A synonym of **Stachys** (which *see*).

ERISMA (from *erisma*, strife; in reference to the difficulty experienced in locating the genus in the natural arrangement). SYNS. *Debræa, Dittmaria.* ORD. *Vochysiaceæ.* A small genus (four species) of stove trees, natives of Northern Brazil and Guiana, and closely allied to *Qualea.* Flowers small or rather large, paniculate. Leaves opposite, petiolate, coriaceous. Some of the species attain a great size in their native places. *E. floribundum* has been introduced, but is probably lost to cultivation.

ERITHALIS. SYN. *Herrera.* Flowers usually in terminal, pedunculate, erect panicles, very rarely solitary; calyx limb truncate or five- to ten-toothed; corolla salver-shaped or rotate, with five to ten lobes. Leaves opposite, petiolate, coriaceous, elliptic, obovate or lanceolate.

E. odorifera (scent-bearing). A synonym of *E. fruticosa.*

ERITHALIS (of Forster). A synonym of **Timonius** (which *see*).

ERITRICHIUM. Bentham and Hooker include *Krynitzkia* and *Plagiobothrys* hereunder. This genus comprises about seventy species. Flowers blue or white, in simple or branched racemes, or rarely nearly all axillary; calyx deeply five-cleft or five-partite; corolla tube short or rarely longer than the calyx, the lobes five, imbricated, obtuse, spreading; stamens five, affixed to the tube, included. Nutlets four, or fewer by abortion. Leaves alternate or (in very few species) opposite, usually narrow. To the species described on p. 529, Vol. I., the following should be added:

E. barbigerum (beard-bearing).* *fl.* white, small, much resembling those of a Myosotis, disposed in branching, scorpioid cymes; calyx lobes linear, about ⅛in. long. Summer and autumn. *l.* lanceolate. California, 1886. A pretty annual; the whole plant clothed with long, spreading hairs. (R. G. 1886, pp. 358-9, i. 42; R. H. 1885, p. 552, f. 99.) According to the "Index Kewensis," the correct name of this plant is *Krynitzkia barbigera.*

E. nothofulvum. *fl.* white, sweet-scented. California, 1892. A hardy annual, in general appearance not unlike a Forget-me-not. According to the "Index Kewensis," the correct name of this plant is *Plagiobothrys nothofulvus.*

ERNDLIA. A synonym of **Curcuma** (which *see*).

ERODENDRON. A synonym of **Protea** (which *see*).

ERODIUM. Though the Erodiums generally are best accommodated on the rockery, *E. Manescavi* is such a vigorous grower, quickly attaining a good size, that it is best for the herbaceous border, thriving particularly well in chalky soils.

To the species described on p. 529, Vol. I., the following should be added:

E. chamædryoides (Chamædrys-like). The correct name of *E. Reichardi.*

E. chrysanthum (golden-flowered).* *fl.* lemon-yellow; petals yellow, obovate, twice as long as the calyx. Summer. *l.* adpressedly silvery-silky, bipinnate; segments rather broad, obtuse. Stem shortened, scape-like. Greece, &c., 1897. Plant tufted. A fine, hardy perennial.

E. geifolium (Geum-leaved). A synonym of *E. hymenodes.*

E. moschatum (Musk-like). *fl.* pink; petals unequal, obovate, equalling the calyx; peduncle long, many-flowered. May to July. *l.* pinnatisect; segments eleven to thirteen, large, ovate, doubly serrated. Stem ascending, rather thick. South Europe, North Africa, &c. Half-hardy annual.

EROPHILA (from *er*, the spring, and *phileo*, to love; in reference to the flowering period). ORD. *Cruciferæ.* A small genus (about five species) of small, hardy annuals, extending from Europe to Northern India, *E. vulgaris* (Whitlow-Grass, SYN. *Draba verna*) being a British plant; they are closely allied to *Draba. E. præcox* has been introduced, but is of little horticultural value.

ERPETION. Included under **Viola** (which *see*), the correct name of *E. reniforme* being *V. hederacea.*

ERXLEBIA. A synonym of **Commelina** (which *see*).

ERYCINA (a name of Venus, from Mount Eryx, a mountain in Sicily, where she had a temple). ORD. *Orchideæ.* A monotypic genus. The species is a singular, little, Oncidium-like Orchid, but differing remarkably from that genus in the structure of the lip and column, the former being almost equally three-lobed, while the latter is short, thick, and wingless. For culture, *see* **Oncidium.**

Erycina—*continued.*

E. echinata (hedgehog-like). *fl.* ⅝in. across; petals green; lip yellowish, large and flat; racemes axillary from the base of the pseudo-bulb, decurved, loosely many-flowered. April. *l.* 2in. to 4in. long, ovate-oblong, with a few brown stripes. Stems tufted, 2in. to 3in. high, clothed with imbricating bracts below and leaves above, and terminating in a small, two-leaved pseudo-bulb. Mexico, 1892. (B. M. 7389.)

ERYNGIUM. These plants are suited for the flower-border, shrubbery, or even for lawns, but the situation must be well drained: damp is fatal to them. *E. eburneum* should be treated as a half-hardy annual.

To the species described on pp. 529-30, Vol. I., the following should be added:

E. aquaticum. The correct name is *E. yuccæfolium.*

E. asperifolium (rough-leaved). A synonym of *E. glaciale.*

E. cæruleum (blue).* *fl.* blue; involucral bracts five, subulate, twice or thrice as long as the head. July. *l.*, radical ones ovate-cordate, undivided, three-lobed, or trisected; cauline ones sessile, rigid, palmate or almost pinnate. Stems dichotomously and divaricately corymbose. *h.* 2ft. to 3ft. Orient, 1816. Hardy.

E. creticum (Cretan). *fl.* amethystine blue; involucral bracts five, exceeding the long, somewhat rounded head. Summer. *l.*, cauline ones almost palmately cleft, the lobes lanceolate, spiny, ciliate-toothed at base. Stems divaricately much-branched above. Crete, &c. Hardy.

E. glaciale (glacial). *fl.* blue; involucral bracts six to eight, thrice as long as the roundish heads. Summer. *l.*, radical ones cuneate-spathulate, trisected, with long and rigid spines, the segments three-lobed; cauline ones nearly sessile, deeply dissected. Stem 3ft. to 6ft. high. Spain. Hardy. SYN. *E. asperifolium.*

E. hybridum (hybrid). A distinct kind, having deep blue flowers and stems, and growing to a height of 2ft.

E. Lasseauxii (Lasseaux'). *fl.* reddish-purple, small, in a loose, branched panicle. Summer. *l.* 2½ft. to 3ft. long, narrow, forming a strong tuft. Stems 6ft. to 9ft. high, slightly leafy. South America. Closely related to *E. dichotomum.* (R. H. 1874, p. 375.)

E. Leavenworthii (Leavenworth's). *fl.* bright violet-purple; heads 1½in. long, nearly 1in. across, crowned with a leafy tuft. Summer. *l.*, cauline ones palmately five- to seven-parted, about 2in. long, with spreading, pungent segments. Arkansas, &c.

E. Oliverianum (Oliver's).* *fl.* blue; involucral bracts ten to twelve, longer than the head of flowers, and having about six teeth on each side. *h.* 3ft. to 12ft. Orient. Hardy. Probably a garden hybrid, of which *E. giganteum* is one of the parents; it resembles *E. alpinum* in habit. (Gn. 1885, ii., 484.)

E. planum (smooth).* *fl.* light blue, small, ball-shaped, and produced in great numbers. *h.* 3ft. Europe, &c. Of value on account of its late-flowering qualities.

E. Spinalba (white-spined). *fl.* whitish, in an ovate-cylindrical head; involucral bracts nine or ten, pinnatifid, very rigid. Summer. *l.*, radical ones three- to five-parted, the lobes deeply toothed or dichotomously incised. Stems thick, almost simple. Europe. Hardy.

E. triquetrum (triquetrous). *fl.* blue; involucral bracts three or four, pungent-pointed, keeled, exceeding the rounded head; peduncles triquetrous. July. *l.*, radical ones petiolate, cordate, three-lobed, the lobes spiny-toothed; cauline ones three- to five-parted. *h.* 1ft. Sicily, &c. 1824. Hardy.

E. virginianum (Virginian). *fl.* pale blue or nearly white; heads numerous, ⅜in. in diameter; involucral bracts seven or eight, three-cleft. August. *l.* linear-lanceolate and linear, uncinately- (rarely spinulose-) serrated, the lower ones five to ten lines wide. Stems 1½ft. to 5ft. high, cymosely branched, often compound at the top. North America. Hardy biennial.

E. yuccæfolium is the correct name of *E. aquaticum.*

Occasionally to be met with are: *E. campestre* (Europe), *E. corniculatum* (Portugal), and *E. dichotomum* (Mediterranean region).

ERYSIMUM. Sepals erect; stamens free. These fragrant yellow Wallflower-like subjects are excellent for sunny spots in rockeries or in flower-borders.

To the species described on p. 530, Vol. I., the following should be added:

E. arkansanum (Arkansas). A synonym or form of *E. asperum.*

E. canescens (hoary). *fl.* yellow, scentless; claw longer than the calyx. June. *l.* linear, entire or slightly toothed, somewhat canescent. South Europe, 1816. A neat alpine biennial.

E. murale (wall-loving). *fl.* golden-yellow. A charming, dwarf, compact variety. (R. H. 1897, p. 43, f. 14-15.)

E. pachycarpum (thick-fruited). *fl.* bright orange-yellow; petals obovate-spathulate. Summer. *l.* petiolate, lanceolate,

Erysimum—*continued.*

sinuate-toothed. Stems very robust, many-angled, erect. *h.* 1½ft. to 2ft. Temperate Sikkim-Himalaya.

E. pulchellum is a form of *E. rupestre.*

E. rhæticum (Rhætian). A synonym of *E. ochroleucum helveticum.*

E. rupestre (rock-loving).* *fl.* yellow, small. *l.* slightly toothed; radical ones spathulate; cauline ones oblong, pubescent. Summer. Stems suffruticose. Asia Minor. A useful plant for the rockery. *E. pulchellum* is a form of this.

E. Wahlenbergii (Wahlenberg's).* *fl.* bright yellow. July. *l.* lanceolate, toothed. Stem 2ft. high, branched. Transylvania, 1891. A very showy perennial.

ERYSIPHE GRAMINIS. *See* **Oidium.**

ERYSIPHE MARTII and **E. COMMUNIS.** *See* **Vine Fungi.**

ERYTHEA. To the species described on p. 530, Vol. I., the following should be added:

E. aculeata (prickly), of Regel. A synonym of *E. armata.*

Erythrina—*continued.*

E. caffra (Kaffir), of Ker and Gawler. A synonym of *E. Humeana.*

E. Constantiana (Constant's). *fl.* scarlet, large; racemes axillary towards the ends of the branches. Trunk 4ft. in diameter, and, as well as the branches, covered with persistent spines. *h.* 20ft. Origin unknown. (R. H. 1896, p. 524.)

E. Humeana. The correct name of *E. Humei.*

E. indica picta (painted). A variety having variegated leaves.

E. marmorata. The correct name of *E. indica marmorata.*

E. Parcelli. The correct name of *E. indica Parcelli.*

E. picta (painted). A form of *E. indica.*

E. Vespertilio (bat). *fl.* numerous, in showy, erect racemes, pendulous; standard ovate, nearly 1½in. long. *l.*, leaflets obversely triangular, cuneate at base, the front side deeply hollowed out, so as to leave the two front angles projecting, the hollowed portion having sometimes a central apiculus. Western Australia, 1885. A grotesque, warm greenhouse shrub. See Fig. 377, for which we are indebted to Mr. Wm. Bull.

Other species or varieties that are, or have been, in cultivation are: *E. Hendersoni, E. insignis* (R. G., t. 903), *E. profusa, E. pulcherrima,* and *E. velutina.*

FIG. 377. UPPER PORTION OF PLANT OF ERYTHRINA VESPERTILIO.

E. armata (armed). *fl.*, spadix tomentose, paniculate, pendent. *l.* large, fan-shaped, palmatisect, glaucous; margins of the petioles armed with spines. California, 1887. SYNS. *E. aculeata* of Regel (R. G. 1887, 279, f. 74), *Brahea glauca, B. Roezlii.*

ERYTHRÆA. Most of the species are broadly distributed over the temperate and sub-tropical regions of the Northern Hemisphere, but they are rarely found within the tropics; one extends as far as Chili, and another is Australian. To those described on pp. 530-1, Vol. I., the following should be added:

E. linarifolia (Linaria-leaved). The correct name of *E. littoralis,* which is sometimes classed as a variety of *E. Centaurium.*

E. Massoni (Masson's). The correct name of *E. diffusa.*

E. spicata (spicate). *fl.* pink, sub-sessile, erect, bracteate, disposed in long and rather loose, simple or bifid spikes. July and August. *l.* oblong, about five-nerved. Stems quadrangular, thickly leafy, erect-branched above. South Europe, &c. (on salt marshes). Half-hardy annual.

ERYTHRINA. To the species described on pp. 531-2, Vol. I., the following should be added:

E. Bidwilli (Bidwill's). A hybrid between *E. herbacea* and *E. Crista-galli.*

ERYTHROCHÆTE PALMATIFIDA. A synonym of **Ligularia japonica** (which *see*).

ERYTHROCHITON. Flowers pedunculate or upon the leaves, showy, racemose or sub-fasciculate; calyx large, red; corolla white or pink, the tube straight or curved, the lobes spreading, almost equal, imbricated or induplicate-valvate. Leaves towards the tip of the stem, alternate, very long, obovate-lanceolate, bifoliolate. *E. Hypophyllanthus* is now classed as a distinct genus, under the name of *Hypophyllanthus Lindeni.*

ERYTHRODANUM. A synonym of **Nertera** (which *see*).

ERYTHRODES. A synonym of **Physurus** (which *see*).

ERYTHRONIUM. This genus now embraces eight species, seven of which are North American. For the rock-garden, edgings, the front lines of mixed borders, or for naturalising, these charming little plants, with their Cyclamen-like flowers and often elegantly marbled foliage, are equally adapted. Nor does their utility cease with their outdoor cultivation. As pot-plants they are likewise pretty. A partially shaded situation and a loam and

Erythronium—*continued.*

peat soil suit them well, and they should be planted about 3in. deep in autumn, and covered with sand. Many additions, chiefly from America, have been made to the ranks of these flowers within the last ten years, and the newer introductions are far superior to the older ones, beautiful though some of the latter are. To those described on p. 533, Vol. I., the following should be added:

E. albidum (whitish). *fl.* white or bluish-white, solitary; perianth segments 1in. to 1¼in. long, without auricles at the base. *l.* oblong-lanceolate, 4in. to 6in. long, slightly or not at all mottled. Stem 6in. to 9in. long. Corm ovoid, stoloniferous. North America, 1824.

E. a. bracteatum (bracted). *fl.* yellow. *l.* longer than in the type. Mountainous regions, North America.

Erythronium—*continued.*

opposite, oblong, dull green, spotted purplish-brown, narrowed to a long, channelled base. Oregon, 1887. (B. M. 7017; G. C. 1888, iii., p. 653, f. 86; G. & F. 1888, i., p. 317, f. 50.)

E. Howelli (Howell's).* *fl.* pale pink, with a deep orange spot near the base of each perianth segment; inner segments having scales or auricles; stamens white. Oregon. Resembles *E. Hendersoni.*

E. Johnsonii (Johnson's).* *fl.* of a reddish-pink hue, deeper on the outside, with a zone of orange-yellow at the base of the perianth segments; scapes 10in. to 12in. high. Southern Oregon, 1896. (G. C. 1895, xix., p. 543, f. 83; Gn. li., p. 136.)

E. multiflorum (many-flowered). *fl.* bright lilac, with a yellow base, as many as fifteen to a peduncle. *l.* mottled. Probably a variety of *E. purpurascens.*

E. Nuttallianum (Nuttall's).* *fl.* golden-yellow, with reddish-brown anthers. *l.* dark green. North America. This species is

FIG. 378. ERYTHRONIUM REVOLUTUM PINK BEAUTY.

E. citrinum (citron-yellow). *fl.* lemon-yellow; perianth segments having a broad, orange blotch near their auricled base, and the tips often suffused with pink; peduncles usually three-flowered. Oregon.

E. Dens-canis. Besides the white form, the following may be mentioned: *japonicum* (from Japan), flowers violet-purple, with a blackish spot at the base of the petals; *sibiricum*, a more robust form than the type, from the Altai Mountains, having flowers of a deep rosy-purple, banded with purplish-crimson near the base of each segment, and with a yellow eye.

E. Hartwegi (Theodore Hartweg's).* *fl.* usually solitary, sometimes two or three to a peduncle, remaining in beauty for three or four weeks; perianth segments cream-coloured with an orange zone at base. Spring. *l.* marbled on the upper surface with dull purple. Mountains near Sacramento, 1898. (B. M. 7583; G. C. Sept. 26, 1896, p. 361, f. 64.)

E. Hendersoni (Henderson's).* *fl.* drooping, faintly scented; perianth campanulate, about 2in. in diameter, the segments pale lilac, spotted dark purple at base, reflexed from half-way down; peduncle 6in. to 8in. long, one- or two-flowered. April. *l.* two, somewhat rare in cultivation. It comes very close to *E. grandiflorum*, which, however, has white anthers. It likes a sunny but rather damp position.

E. propullans (budding forth). *fl.* rosy-purple, yellow at base; perianth ¾in. long; stigma undivided; peduncle one-flowered, 2in. to 3in. long. *l.* oblong-lanceolate, 2in. to 3in. long, slightly spotted. Corm small, ovoid, stoloniferous. Minnesota.

E. purpurascens (purplish). *fl.* light yellow, tinged with purple, deep orange at the base, usually four to twelve in a subumbellate raceme from 1in. to 1½in. long. May. *l.* large, more or less oblong, frequently undulated. Bulbs 1in. to 2in. long. Sierra Nevada.

E. p. uniflorum (one-flowered). *fl.*, peduncles slender, one-flowered. SYN. *E. revolutum.*

E. revolutum (revolute). A synonym of *E. purpurascens uniflorum.* There are several varieties of this. One, Pink Beauty, is shown at Fig. 378, for which we are indebted to Messrs. Barr and Sons.

E. Smithii (Smith's). This is probably identical with *E. purpurascens revolutum.*

ERYTHROPHLŒUM. *Fillæa* and *Mavia* are synonymous with this genus.

ERYTHROPOGON. Included under **Metalasia** (which *see*).

ERYTHRORHIZA. A synonym of **Galax** (which *see*).

ERYTHROTIS. This genus is now included under **Cyanotis** (which *see*), the correct name of *E. Beddomei* being *C. kewensis.*

ERYTHROXYLON. *Steudelia* (of Sprengel) is synonymous with this genus. To the species described on p. 533, Vol. I., the following should be added:

E. mexicanum (Mexican). *fl.* greenish; pedicels axillary, solitary, scarcely longer than the petioles. *l.* obovate-oblong, rounded and often retuse at apex, rather acute at base, subcoriaceous, glabrous; stipules equalling the petioles. Mexico, 1869. (R. G. 615.)

ESCALLONIA. SYNS. *Stereoxylon, Vigiera.* To the species described on pp. 533-4, Vol. I., the following should be added:

E. Berteriana (Bertero's). A synonym of *E. pulverulenta glabra.*

E. exoniensis (Exeter).* *fl.* pink and white, pendent, produced in profusion. *l.* deep green, ovate, small. 1891. A very pretty, hardy shrub.

E. langleyensis (Langley).* *fl.* pink, very numerous. June. A garden hybrid between *E. Philippiana* and *E. macrantha.* 1897. (G. C. 1897, xxii., p. 17, f. 4.)

E. Philippiana.* A variety of *E. virgata.* It forms a beautiful bush, and is hardy.

E. pulverulenta glabra (smooth). *fl.*, calyx shining and clammy; petals elliptic-oblong, sessile; racemes spicate, terminal, simple, twice as long as the leaves. *l.* elliptic, serrated, shining above, 2½in. to 3in. long, 1¼in. broad; petioles ¼in. long. *h.* 5ft. to 6ft. Chili. Plant glabrous, clammy from resin. SYN. *E. Berteriana.*

E. revoluta (revolute). *fl.* white, ¾in. long, spreading, pedicellate; petals with a long, straight claw, and a short, oblong, rounded limb; racemes or panicles terminal, sessile, erect, simple or thyrsoid. September. *l.* ¾in. to 1¼in. long, obovate, acute or cuspidate, toothed, pubescent. *h.* 10ft. to 20ft. Chili, 1887. (B. M. 6949.)

E. rubra. Of this species there is a white-flowered variety, *alba.*

E. Sellowiana (Sellow's). *fl.* white; calyx teeth short, entire; petals spathulate; panicles terminal, many-flowered. Summer. *l.* lanceolate, tapering into the petioles, serrated, resinous-dotted beneath. Branches erect. *h.* 10ft. to 20ft. Brazil. Plant glabrous.

ESCHENBACHIA. A synonym of **Conyza** (which *see*).

ESCHERIA. A synonym of **Gloxinia** (which *see*).

ESCHSCHOLTZIA. The four or five species of this genus are confined to North-West America. *E. californica* and *E. crocea* and its varieties are amongst the most brilliant flowered of hardy annuals. They are best sown in autumn, and thinned out to nearly 1ft. apart.

To the information given on p. 534, Vol. I., the following should be added:

E. cucullata (hooded). *fl.* lemon-yellow, with an orange spot at base, somewhat small, borne on long, depressed branches. *l.* when young strongly cucullate-incurved. Northern California, 1894. A remarkable species.

E. fumariæfolia (Fumitory-leaved). A synonym of *Hunnemannia fumariæfolia.*

E. maritima (maritime). *fl.* of a paler yellow, with an orange blotch at the base of each petal. *l.* greyish-white. Otherwise like *E. californica.* 1894.

ESMERALDA. This genus is included by the authors of the "Genera Plantarum" under **Arachnanthe** (which *see*).

E. Clarkei (Clarke's). A synonym of *Vanda Clarkei.*

ESPINOSA. A synonym of **Eriogonum** (which *see*).

ETHANIUM. A synonym of **Renealmia** (which *see*).

ETHULIA (derivation obscure). SYN. *Kahiria.* ORD. *Compositæ.* A small genus (two species) of half-hardy, branched herbs, one Javanese, the other a native of India, tropical Africa, &c. Flower-heads rather small, corymbose, homogamous; involucral bracts in many series; receptacle flat, naked; florets all tubular. Leaves alternate, serrated. They thrive in any fairly good soil, and may be increased by seeds.

Ethulia—*continued.*

E. angustifolia (narrow-leaved). A synonym of *E. conyzoides.*

E. conyzoides (Conyza-like). *fl.-heads* purplish or reddish, very numerous; peduncles short or long. *l.* 2in. to 5in. long, narrowly or broadly elliptic-lanceolate, acuminate, narrowed and entire at base, glandular-dotted; serratures coarse, distant. India, &c. An erect, glabrous or puberulous, leafy annual. (B. R. 695.) SYN. *E. angustifolia.*

EUADENIA. Sepals four, free, lanceolate; petals four, linear-spathulate, two of them elongated; stamens five, free or coalescing in a short circle. Leaves trifoliolate.

EUCALYPTUS. Calyx tube turbinate or campanulate, the base adnate with the ovary, the apex truncate, entire or remotely toothed; stamens numerous, in several series, free. To the species described on pp. 535-6, Vol. I., the following should be added:

E. Andreana (André's). *fl.* disposed in globose clusters, on short peduncles. *fr.* globose, the size of a small pea, with a depressed rim, in dense clusters. *l.* opposite, sub-sessile, 4in. long, lanceolate, acuminate. 1890. (R. H. 1890, p. 346, f. 105-6.)

E. ficifolia (Ficus-leaved). *fl.* showy; calyx slightly tinged with red; filaments beautiful cinnabar-red. *l.* conspicuously stalked, leathery, always somewhat decurrent into the stalk, pointed at the apex, or sometimes narrowly so. A tree seldom exceeding 50ft. in height in its native forests.

E. leucoxylon (white-wooded). Ironbark; White Gum. *fl.* on axillary, terete or slightly flattened peduncles. January. *fr.* obovoid or sub-globular, ¼in. in diameter. *l.* lanceolate, acuminate, often falcate, mostly 3in. to 6in. long. 1891. A medium-sized or tall tree. (Gn., 1891, t. 799.)

E. resinifera (resin-bearing). Grey or Red Gum; Leather Jacket; Red Mahogany. *fl.* six to eight on an axillary or lateral peduncle, more or less flattened. *fr.* obconical, sub-globose-truncate, or almost hemispherical. *l.* ovate-lanceolate or lanceolate, acuminate, straight or falcate, mostly 4in. to 6in. long, rather thick. A tall tree, with rough bark. (G. C. Aug. 3, 1872, p. 1541; S. E. B., t. 84.)

E. Staigeriana (Staiger's). *fl.* white. *l.* exquisitely fragrant. It is doubtful if this species is in cultivation. (G. C. 1889, v., p. 437, f. 81.)

E. stricta (erect). *fl.* small, four to eight to a short peduncle. *fr.* globose-truncate, ¼in. in diameter. *l.* linear-lanceolate or linear, straight or falcate, obtuse or acuminate, mostly 2in. to 4in. long, very thick and shining. 1889. A shrub or small tree, with stringy bark. (B. M. 7074.)

E. urnigera (pitcher-bearing). *fl.* three together or rarely solitary; peduncles axillary. *fr.* about ¼in. long, somewhat urn-shaped. *l.* ovate, oval-oblong, or lanceolate, obtuse, 2in. to 4in. long, straight or rarely oblique, very thick. *h.* sometimes 50ft. 1888. (G. C. 1888, iii., p. 460, f. 64.)

E. viminalis (twiggy). Manna Gum; White Gum. *fl.* three to eight on a short, axillary or lateral peduncle. *fr.* sub-globose-truncate, three to five lines in diameter, the rim rather broad. *l.* lanceolate, more or less falcate and acuminate, 3in. to 6in. long. 1810. A moderate-sized or large tree. (G. C. Nov. 24, 1888, p. 597.)

The following are, amongst others, in cultivation in some Continental gardens: *E. amplifolia, E. botryoides, E. cærulescens, E. cinerea, E. cordata, E. corynocalyx, E. cosmophylla, E. crebra, E. diversicolor, E. diversifolia, E. doratoxylon, E. gomphocephala, E. goniocalyx, E. jugalis, E. longifolia, E. marginata, E. megacarpa, E. melliodora, E. Mulleri, E. occidentalis, E. piperita, E. Rameliana, E. rostrata, E. rudis, E. Stuartiana, E. tereticornis,* and *E. tetraptera.* Most of these would thrive in the Channel Islands.

EUCHARIDIUM. Three species are now referred to this genus. Flowers rather large, solitary, sessile; calyx tube linear, long-produced; petals four, clawed, three-lobed or cuneate-obcordate, the middle lobe produced; stamens four, inserted at the throat of the calyx. Leaves alternate, petiolate, ovate-lanceolate, oblong, or linear, entire. To the species described on p. 536, Vol. I., the following should be added:

E. Breweri (Brewer's).* *fl.* pink with a white centre, axillary very numerous; petals four, trilobed, the central lobe very long and narrowed at base. Summer. *l.* ovate-oblong or linear, entire. Stems short, branched. California. Plant dwarf.

E. grandiflorum is now regarded as a distinct species.

EUCHARIS. Flowers white, showy, few in an umbel; perianth tube cylindrical, straight or curved, the lobes equal, rather broad, spreading; stamens shorter than the lobes; bracts numerous, narrow, the two or three outer ones broader, involucral. Leaves petiolate, oblong. Bulb tunicated.

Eucharis—*continued.*

The cultivation of these beautiful flowers is not so difficult as is popularly supposed. Where so many fail is in over-forcing the bulbs with a view to obtaining a third flowering season, instead of remaining content with two; another mistake is allowing a season of rest. By far the best results are obtained by those who do not dry off the plants after flowering. All dead and decaying matter should be removed from the bulbs previous to potting, and if freshly imported they should be placed in a vessel of water for a day; this will tend to cleanse them of "mite." The bulbs should not be covered entirely at first; they should, in fact, be started before the operation is complete, maintaining a temperature of 70deg. and in a moist atmosphere. Weak liquid cow-manure is the best stimulant for Eucharis.

Occasionally both Mealy Bug and Thrips infest Eucharis; but these are comparatively easy to cope with by syringing the plants with a good insecticide. There is, however, a pest which is far more formidable. It is popularly known as the Eucharis Mite, but this is not a very appropriate name, as the Mite may be found on numberless Amaryllidaceous plants, grown alike under glass and outside. It is a species of *Rhizoglyphus*, and it ruins thousands of bulbs annually, and always acts prejudicially upon the crop. The chief symptoms of attack are a yellowing and dying away of the foliage. Where the attack is very severe the bulbs seldom get over it; but a weak preparation of Kerosene Emulsion carefully applied, taking care that the roots are kept free from the insecticide, will oust the enemy.

To the species described on p. 536, Vol. I., the following should be added:

E. Bakeriana (Baker's). *fl.* like those of *E. grandiflora*, with the corona of *E. candida*, 2½in. in diameter; umbels four- to six-flowered; scape 10in. to 18in. high. January and May. *l.* four or five, on stout petioles, elliptic, 10in. to 18in. long, very dark green, closely striated with many obscure nerves. Bulb ovoid, brown-scaly. Colombia, 1890. (B. M. 7144; G. C. 1890, vii., f. 61, 1899, xxvi., p. 249.)

E. burfordensis (Burford Lodge).* *fl.* over 3in. across and about 2in. long, bell-shaped. *l.* like those of *E. Mastersii*, but narrowed as in *E. Stevensii*. 1899. A supposed hybrid between the species named. (G. C. 1899, xxvi., p. 247.)

E. Clibrani (Clibran's). A synonym of *Urceocharis Clibrani*.

E. elmetana (Elmet Hall). A hybrid stated to have been raised between *E. Sanderi* and *E. grandiflora*; it is described as of freer growth than *E. Sanderi*. (G. C. Nov. 4, 1899, p. 345.)

E. grandiflora fragrans (fragrant). *fl.* usually six to a peduncle, much more fragrant than in the type. *l.* small, sub-erect, channelled, with a distinct curvature. Origin uncertain.

E. g. Lowii (Low's). *fl.* white, as large as those of the type, each segment having its side edges considerably incurved; corona short. *l.* resembling those of *E. candida*, but larger, borne on tall footstalks. Colombia, 1893. A supposed natural hybrid between *E. grandiflora* and *E. Sanderi*. (G. C. 1893, xiii., pp. 455, 533, f. 78.)

E. g. Moorei (Moore's). *fl.* smaller than in the type; corona white inside, with a fine, yellow line where the filaments run down; teeth between the filaments large and acute. *l.* roundish, much smaller than in the species. 1888. A distinct variety.

E. Hartwegiana is correctly placed under **Caliphruria** (which *see*), according to J. G. Baker.

E. Lehmanni (Lehmann's). *fl.* white, 1¼in. in diameter, about four in an umbel; corona deeply twelve-toothed. *l.* two, elliptic-oblong. Popayan, 1839. Closely allied to *E. candida*. It produces seed freely. (B. G. 1889, p. 313, t. 1300, f. 1.)

E. Mastersii (Dr. Masters'). *fl.* nearly sessile; perianth tube 2in. to 2½in. long; limb 3in. in diameter, the segments ovate, much imbricated; staminal cup striped green; pedicels short; umbel two-flowered; scape less than 1ft. long. February. *l.* distinctly petiolate, oblong, acute, 8in. to 10in. long, 4in. to 5in. broad. Bulb 1½in. to 2in. in diameter. Colombia, 1885. (B. M. 6831A; G. C. 1899, xxvi., p. 241.)

E. Sanderi is the correct name of *E. Sanderiana*.

E. S. multiflora (many-flowered). *fl.* five or six, considerably smaller than those of the type; stripes of the staminal cup green. Colombia, 1885. (B. M. 6831B.)

E. Stevensii (Stevens').* *fl.* pure white, tinted with yellow on the outside of the corona, 3in. to 3½in. across; umbels about seven-flowered. *l.* 12in. to 14in. long, 5in. to 6in. broad. 1883. A hybrid between *E. candida* and *E. Sanderi*. (G. C. 1899, xxvi., p. 243.)

EUCHLÆNA. *E. mexicana* (B. M. 6414) is the correct name of *E. luxurians*.

EUCHRESTA (from *euchrestos*, useful; in allusion to the medicinal qualities of the seeds). ORD. *Leguminosæ*. A small genus (two species) of stove or greenhouse shrubs; one is found in the Indian Archipelago, on the Himalayas, and in Formosa, and the other is Japanese. Flowers white, scattered at the sides of the rachis of a terminal or axillary raceme; calyx shortly sinuate-toothed; standard oblong, slightly recurved; wings narrow-oblong, free. Leaves alternate, impari-pinnate; leaflets three to seven, opposite, exstipellate. *E. japonica* is a greenhouse shrub, thriving in any ordinary soil. Propagated by seeds or by cuttings of the ripened shoots, inserted in sand, under a hand-glass, in heat.

E. japonica (Japanese). *fl.* bluish-white, ten to thirty in a terminal raceme. *l.* trifoliolate; leaflets coriaceous, glabrous, obovate-elliptic, obtuse or slightly produced at apex, the terminal one 2in. to 4in. long. *h.* 1ft. to 1½ft. Japan, 1865. Plant unbranched, erect or slightly decumbent at base. (R. G. 1865, t. 487.)

EUCLEA. SYNS. *Brachycheila*, *Kellauia*, *Rymia*. The species are found in tropical and South Africa.

EUCNEMIS. A synonym of **Govenia** (which *see*).

EUCOMIS. SYN. *Basilæa*. This genus now embraces ten species, one of which is found in tropical Africa. Flowers green, pedicellate, in a dense or elongated raceme; perianth persistent, with six sub-equal, spreading segments; stamens six, shorter than the perianth; scape simple, leafless. Leaves radical, oblong or elongated. Bulb tunicated, often rather large.

E. punctata is the commonest of the species yet introduced, and it is well worthy of a place in gardens in a favoured part of this country. A light, rich soil is best, and the bulbs should be planted some 5in. deep in autumn, protecting their quarters with light litter. The foliage is very bold, and this, combined with the tuft of leaves surmounting the flower-spike, gives the plant a distinct appearance. Species like *E. punctata* make a very good pot plant for the greenhouse; while the more recently introduced *E. zambesiaca* needs stove treatment. The potting should be done in autumn, giving but little water during winter. Propagation is effected by offsets in October.

To the species described on pp. 537-8, Vol. I., the following should be added:

E. clavata (club-shaped). A synonym of *E. regia*.

E. pallidiflora (pale-flowered). *fl.*, perianth 1¼in. in diameter, the segments greenish-white, oblong, acute; raceme 1ft. long, 2½in. in diameter, crowned with a tuft of thirty small leaves; peduncle 1½ft. to 2ft. long, cylindrical. *l.* five or six to a stem, oblanceolate, sub-erect, over 2ft. long, 4in. to 5in. broad. 1887.

E. regia (royal). *fl.*, perianth ½in. long; raceme dense, oblong, 3in. to 6in. long, with a terminal tuft of twenty to thirty reduced leaves; peduncle clavate, 3in. to 6in. long. *l.* six to eight, lingulate, obtuse, 1ft. to 1½ft. long, 3in. to 4in. broad. Bulb globose, 2in. to 3in. in diameter. 1702 and 1862. SYN. *E. clavata* (Ref. B. 238).

E. robusta (robust). *fl.*, perianth ⅜in. to ⅝in. long; raceme dense, oblong, 6in. to 8in. long, crowned with a tuft of twenty to thirty reduced leaves; peduncle very short. *l.* ensiform, acute, 2ft. long, 2in. broad, very thick, crisped on the margin. Bulb large. 1894.

E. zambesiaca (Zambesi). *fl.*, pedicels shorter; raceme longer and denser; scape not spotted. *l.* firmer. Otherwise like *E. punctata*. Eastern tropical Africa, 1886. Stove.

EUCRYPHIA. SYN. *Carpodontos*. Flowers white, showy, axillary, solitary, pedunculate; sepals four, free; petals four, broad, much imbricated; stamens very numerous, hypogynous. Leaves opposite, coriaceous, simple or pinnate, entire, toothed, or crenate.

E. pinnatifolia is a valuable hardy deciduous shrub (growing some 10ft. to 12ft. high in its native country), as it will flourish even in the vicinity of towns. The flowers are some 3in. in diameter, pure white, with long filaments and bright yellow anthers, and are produced in late summer. To get the best results it should be planted in a sunny spot where the wood can get well ripened. Hardly less attractive than the flowers is the Rose-like foliage, which in autumn assumes a beautiful orange tint.

To the species described on p. 538, Vol. I., the following variety should be added:

E. Billardieri Milliganii (Milligan's). Plant smaller and more compact in all its parts than the type, the leaves often all less than ½in. long. Tasmania, 1891. (B. M. 7200.)

EUDOLON. A synonym of **Strumaria** (which *see*).

EUDOXIA. A synonym of **Gentiana** (which *see*).

EUFRAGIA. Included under **Bartsia** (which *see*).

EUGEISSONA (from *eu*, good, and *geisson*, the projecting part of a roof; in allusion to the purpose to which the leaves are said to be put). ORD. *Palmæ*. A genus embracing about half-a-dozen species of unarmed, tufted, monocarpic, spinous, stove Palms, all natives of the Malayan Archipelago, and allied to **Plectocomia** (which *see* for culture of the only species introduced). Flowers large, coriaceous, solitary or in twos or threes, the females the larger; spadix terminal, erect, thyrse-like, clothed below with flagelliferous leaf-sheaths. Leaves pinnatisect; leaflets lanceolate; rachis armed, not flagelliferous.

E. tristis (sad). *fl.* 1in. to 1½in. long, terminal on the flexuous branches of the spadix; bracts many, closely imbricated; spadix 4ft. to 6ft. long, the sheaths and spathes armed. *l.* 15ft. to 20ft. long; leaflets many, 2ft. to 2½ft. long, narrow-lanceolate, subulate, acuminate, the midrib bristly above; petioles 7ft. to 10ft. long, armed with flat, brown spines. Stems densely tufted, very short, or wanting. Malay Peninsula and Penang.

EUGENIA. Including *Jossinia*. Of the 700 species described, probably not more than 500 are distinct as such; they are found most plentifully in tropical and sub-tropical America and tropical Asia, and less copiously in Australia and Africa. Inflorescence centripetal or centrifugal. Leaves opposite, coriaceous or membranous, penniveined. To the species described on p. 538, Vol. I., the following should be added. Several of the alterations of nomenclature are based on the "Index Kewensis."

E. apiculata (apiculate). The correct name of *Myrtus Luma*.

E. caryophyllata (Clove-tree). The correct name of the plant described on p. 274, Vol. I., as *Caryophyllus aromaticus*.

E. Chequen (Chequen). The correct name of *Myrtus Cheken*.

E. cotinifolia (Cotinus-leaved). The correct name of *E. orbiculata*. SYN. *Jossinia elliptica*.

E. fragrans (fragrant). The correct name of *Myrtus fragrans*.

E. Garberi (Garber's). *fl.* white, disposed in small, axillary clusters. *l.* ovate-oblong. Florida, 1889. A tree, attaining 50ft. to 60ft., and with a trunk 1½ft. in diameter, in its native country. (G. & F. 1889, ii., p. 28, f. 87.)

E. Guabiju (native name). *fl.* white, sweet-scented, solitary, axillary; corolla of four petals; stamens very numerous. *fr.* blackish-blue, pruinose, edible, about the size of a Cherry. *l.* opposite, coriaceous, ovate, acute, with a black point, entire, dark green above, much paler beneath. Uruguay. A bushy shrub. (R. H. 1897, p. 304.)

E. Jambolana (Jambolana). *fl.* numerous, sweet-scented; panicles lateral below the leaves, rarely axillary and terminal. August. *fr.* purple, olive-shaped, varying in size from a pea to a pigeon's egg. *l.* ovate or oblong, obtuse, 3in. to 6in. long, acuminate, smooth and shining. India to Australia, 1796. A tree of considerable size. SYN. *Syzygium Jambolanum*.

E. Luma (Luma). A synonym of *E. apiculata*.

E. Michelli. The correct name is *E. uniflora*.

E. orbiculata. The correct name is *E. cotinifolia*.

E. Pimenta is synonymous with *Pimenta officinalis*.

E. uniflora (one-flowered). The correct name of *E. Michelli*.

E. Korthalsiana and *E. magnifica* are rare in cultivation.

EULALIA. When planted out Eulalias make most effective lawn plants. The variegated kinds are best for pots, which may be kept in an unheated house. Spring is the time to divide the plants for purposes of increase.

To the species and varieties described on p. 533, Vol. I., the following should be added:

E. japonica (Japanese). The correct name is *Miscanthus sinensis*.

E. j. gracillima (very slender). This variety is distinguished from the type by its slender habit. 1883.

E. j. g. univittata (one-striped). *l.* long, gracefully bent, with a yellow band along the centre. Japan, 1889. An ornamental variety.

EULEUCUM. A synonym of **Corema** (which *see*).

EULOPHIA. SYN. *Orthochilus*. This genus embraces nearly fifty species. To those described on pp. 538-9, Vol. I., the following should be added:

E. bella (pretty). A synonym of *Lissochilus milanjianus*.

E. bicolor (two-coloured), of Reichenbach. A synonym of *E. Zeyheri*.

E. campestris (field-loving). *fl.* many, sub-secund; sepals yellow or green, striped with pink, ¼in. to ⅜in. long; petals narrower; lip as long as the sepals, the mid-lobe usually purple; scape 6in. to 18in. long, stout or slender, springing from a deformed tuber. Plains of India.

Eulophia—*continued.*

E. carinata (keeled). A synonym of *E. virens*.

E. congoënsis (Congo). A synonym of *E. guineënsis*.

E. deflexa (deflexed). *fl.* 2in. across, disposed in a lax raceme; sepals and petals purple and lilac; lip fringed with white; scape 2ft. high. *l.* lanceolate, about 1ft. long. Natal, 1895.

E. explanata (made plain). *fl.* purple and yellowish, spreading, ⅜in. to ¾in. across; lip sessile, somewhat panduriform; spur broadly conical; scape 4in. to 8in. long, ten- to twelve-flowered. *l.* very young at the flowering period, surrounded at base by broad sheaths. Nepal.

E. gigantea (gigantic). A synonym of *Lissochilus giganteus*.

E. guineënsis purpurata (purple).* *fl.* handsome, in a loose raceme; sepals and petals dark, dull purple, narrow-lanceolate, acuminate; lip bright rose-purple, the front lobe elliptic-ovate, acute. Pseudo-bulbs globose, two- or three-leaved. Western tropical Africa, 1883. A showy plant. (W. O. A. ii. 89.)

E. Ledienii (Ledien's). *fl.* pale brownish-green, with two pale purple blotches on the sides of the lip; sepals and petals nearly ½in. long; raceme lax, 3in. to 6in. long; scape 9in. to 15in. long. *l.* oblong-lanceolate, 6in. to 15in. long. Pseudo-bulbs 1½in. or more long. Tropical Africa, 1888. SYN. *E. maculata* (R. G. 1888, t. 1235).

E. Mackaiana (Mackay's). A synonym of *Zygopetalum Mackayi*.

E. Mackenii (MacKen's). This resembles *E. Ledienii*, but has broader leaves and flower segments. Natal, 1892.

E. maculata (spotted). A synonym of *E. Ledienii*.

E. megistophylla (largest-leaved). *fl.* greenish-yellow, lined with brownish-red, panicled; sepals lanceolate, narrower than the petals; lip four-lobed, the lobes obtuse; spur very short, cylindrical; sheath ample, ochreous, oblong, acute. *l.* more than 1ft. long and 9in. broad, petiolate, cuneate-oblong, acute. Comoro Islands, 1885. A striking species. (R. H. 1887, p. 87.)

E. monophylla (one-leaved). This resembles *E. Ledienii*, but the leaves are of a peculiar grey, suffused with a coppery tint, and with a few olive-green spots arranged in irregular transverse bands.

E. nuda (naked). *fl.* rosy-lilac, green, or purple, rather large; sepals 1in. long, linear-oblong; petals many-nerved; raceme elongated, many-flowered; scape stout, 1ft. to 3ft. long. *l.* 10in. to 14in. long, elliptic-lanceolate. Tuber large. Tropical Himalaya, 1891.

E. pulchra divergens (pretty, diverging). *fl.* purple-spotted, showy; sepals and petals oblong-linear, acute; lip going out into two diverging shanks; spur short and straight; raceme many-flowered, equalling the leaves. *l.* oblong-lanceolate. Isle of Bourbon, 1884. The typical plant is not in cultivation.

E. Saundersiana (W. Wilson Saunders'). *fl.* green, the petals and lip having a few broad, black lines, the centre of the sepals black; lip 5in. to 6in. long, four-lobed; racemes 4in. to 6in. long, many-flowered; scapes erect, 1ft. to 2ft. high. *l.* petiolate, elliptic-oblong, 5in. to 9in. long. Pseudo-bulbs two-leaved. Tropical Africa, before 1864. (R. X. O. ii., t. 173.)

E. scripta (marked). *fl.* green, brown, and yellow, rather showy; sepals and petals linear-oblong; lip three-parted; spur very short; scape radical, branched. *l.* linear-lorate, somewhat distichous. Stem fleshy, oblong. Madagascar, &c., 1872.

E. streptopetala (twisted-petaled). A synonym of *Lissochilus streptopetalus*.

E. Wendlandiana (Wendland's). *fl.* disposed in a raceme 16in. long; sepals pale green, linear; petals white; lip green, with falcate lateral lobes. *l.* three or four at the summit of the pseudo-bulbs, 2ft. long, lanceolate, acute. Pseudo-bulbs 2½in. long. Madagascar, 1897.

E. Zeyheri (Zeyher's). *fl.* pale golden-yellow, with dark purple side-lobes and base to the lip, crowded at the top of the scape; sepals 1½in. long. April. *l.* as long as the scape, narrow-lanceolate, acuminate. *h.* 1ft. to 1½ft. Natal, &c. (B. M. 7330.) SYN. *E. bicolor* (of Reichenbach).

Several other species are in cultivation in botanical establishments, but they have little decorative value.

EULOPHIELLA (a diminutive of *Eulophia*). ORD. *Orchideæ*. A small genus (two species) of stove Orchids, allied to *Cyrtopodium*, from which they differ in habit, and in the absence of a mentum, the perianth being hemispherical and equally rounded at base; they are natives of Madagascar. For culture, *see* **Cyrtopodium.**

E. Elizabethæ, of which such great things were expected on its introduction, has proved somewhat disappointing. The more recently introduced *E. Peetersiana* is a remarkable Orchid, resembling to a very great extent the members of the genus *Lissochilus*. These plants require a hot, moist position in the stove house, but the creeping nature of the rhizome renders them somewhat difficult

Eulophiella—*continued.*

subjects to accommodate. It is advisable to give them a liberal amount of pot room. The best compost is good fibrous peat and sphagnum moss, with a free sprinkling of broken crocks, which assist in maintaining it in an open and porous condition.

Eulophiellas require a liberal amount of moisture during the growing season, and must not be allowed to suffer from want of moisture at the roots at any period of the year. Constant observation is necessary to keep the plants clear of Thrips or other insects, especially when the growths are in a young and tender state. The best means to hold insect pests in check is by frequent fumigation and carefully sponging the plants. The two species described are all that are at present procurable.

E. Elizabethæ (in honour of H.M. the Queen of Roumania ["Carmen Sylva"]). *fl.* white, slightly flushed with pale pink, and with the back of the sepals, ovary and scape of a dull purple, 1½in. across; sepals orbicular; petals smaller; lip much smaller than the sepals, with a golden-yellow disk, three-lobed; racemes many-flowered. April. *l.* nearly 2ft. long, 1½in. broad, narrow-lanceolate. Rhizome creeping and rooting, sending up green, annulate pseudo-bulbs 4in. to 6in. high, the transverse scars at the nodes bearing a thin bunch of brown fibres 1in. long. 1892. (B. M. 7387; I. H. xl., t. 173; L. vii., t. 325.)

E. Peetersiana (Peeters'). *fl.* rose-coloured, large, borne in strong, axillary spikes; lip large, the lateral lobes oblong, the middle one bilobed. *l.* 4in. in diameter at the base. Rhizomes thin, Iris-like, yellowish-white. Madagascar (?), 1896. (G. C. 1893, i., p. 201.) SYN. *Grammatophyllum Rœmplerianum.*

EUNOMIA. Flowers white, shortly racemose. Leaves opposite, sessile or amplexicaul, entire, rather thick.

EUONYMUS. About forty species are included in this genus; they inhabit the mountainous parts of India, North China, Japan, Europe, and North America, a few being found in the Malay Islands.

The deciduous varieties may be increased by seeds, which are best sown in sandy soil in spring, and placed in gentle heat to hasten germination. When the seedlings are an inch or so high they should be pricked off into boxes of turfy loam and liberally supplied with water. The Japanese varieties are very ornamental when grown as standards 3ft. or so in height from the soil. *E. europæus* forms a suitable stock, and should be established in pots prior to grafting, which latter operation should be performed in February. When grafted, they may be laid on their sides or stood in deep pits in a moist temperature of about 60deg. When a union has been formed, a little air must be admitted, and the syringe used freely amongst the top growth, and in a few weeks' time they should be stood outside in a sunny position. After a season's growth in pots nice heads will be formed, and they can then be planted out in the shrubbery, where their heads stand out boldly above the adjoining shrubs.

To those described on pp. 539-40, Vol. I., the following should be added:

E. Carrierei (Carrière's). A form of *E. japonicus.*

E. elegantissima variegata (very elegant, variegated). A garden variety with silvery-variegated leaves. 1832.

E. europæus is commonly known as Catteridge-tree and Prick-wood.

E. japonicus Carrierei (Carrière's).* A prostrate form that will make a picturesque rockwork plant. 1883. A vigorous, green-leaved, garden variety of *E. radicans.*

E. j. Chouveti (Chouvet's).* *l.* thick, fleshy, very narrowly ovate-elliptic, glossy, rounded at tip, with a narrow margin of yellowish-white. A remarkable form, with erect branches. It bears cutting well, and makes an excellent ornamental border plant. 1887.

E. j. columnaris (columnar). *l.* shortly oval, rounded, sometimes sub-orbicular, thick, glossy, with broad, shallow teeth. A vigorous form, of columnar habit.

E. j. compactus (compact).* *l.* small, variegated with white. 1892. A pretty, dwarf, compact variety, well suited for an edging plant or for boxes.

E. nanus (dwarf).* *fl.* greenish-white, four-cleft, one to three on a peduncle. July and August. *l.* lanceolate, entire, nearly opposite, deep green. Branches smooth, somewhat herbaceous. Northern Caucasus, 1830. A neat, trailing under-shrub, suitable for the rockery. SYN. *E. pulchellus* (of gardens).

E. n. foliis-variegatis (variegated-leaved). *l.* small, variegated. 1890. A very dwarf, much-branched variety.

E. pulchellus (pretty). A garden synonym of *E. nanus.*

E. radicans (rooting). A variety of *E. japonicus.*

EUOSMA (of Andrews). A synonym of **Logania** (which *see*), the correct name of *E. albiflora* being *L. floribunda.*

EUOSMUS, or **EVOSMUS** (of Nuttall). Included under **Lindera** (which *see*).

EUOTHONÆA. A synonym of **Hexisia** (which *see*).

EUPATORIUM. To the species described on p. 540, Vol. I., the following should be added. Many of the hardy kinds are suitable subjects for the wild garden.

E. arboreum (tree-like). A synonym of *E. macranthum.*

E. glechonophyllum (Glechon-leaved). *fl.-heads* pink, corymbose; involucral bracts in one or two series, linear. *l.* opposite, ovate-lanceolate, acuminate, toothed; petioles ¼in. to 1in. long. Chili, 1831. Greenhouse perennial.

E. grandiflorum (large-flowered). A synonym of *Brickellia grandiflora.*

E. japonicum (Japanese). *fl.-heads* white, disposed in corymbs. *l.* opposite, trifoliolate, pubescent beneath. Japan and Formosa, 1889. A hardy perennial, closely resembling *E. cannabinum.*

E. Kirilowii (Kirilow's). A synonym of *E. Lindleyanum.*

E. Lindleyanum (Lindley's). *fl.-heads* white; corymbs numerous, sub-umbellate. *l.* in whorls of four, lanceolate, deeply and unequally serrated, and, as well as the stem, pilose. *h.* 2ft. to 3ft. North China. Hardy perennial. SYN. *E. Kirilowii* (R. G., t. 850).

E. macranthum (large-flowered). The correct name of *E. Weinmannianum.* SYN. *E. arboreum.*

E. odoratum (scented). *fl.-heads* pale blue or white, scented, fifteen to twenty-five in a dense, trichotomous corymb. August. *l.* opposite, petiolate, ovate or ovate-lanceolate, acuminate, often cuneate at base, 3in. long, 1½in. broad. Branches cylindrical. *h.* 6ft. West Indies, &c., 1752. Stove shrub.

E. probum (honest).* *fl.-heads* white, about ½in. across, disposed two to four on a branch in a flat-topped corymb. Winter. *l.* opposite, ½in to 1½in. long, somewhat triangular-ovate, acute, rounded or sub-cordate at base, bluntly toothed; petioles ½in. to 1in. long. Stems herbaceous above. Peru, 1870. Whole plant viscid-hairy. A good species for the greenhouse. (G. C. 1890, vii., p. 321, f. 48.)

E. scandens (climbing). A synonym of *Mikania scandens.*

E. serrulatum (slightly serrated). *fl.-heads* rosy-lilac, ¼in. long, oblong, many in a corymb. *l.* 2½in. long, ¾in. to ¾in. broad, opposite, shortly petiolate, lingulate-lanceolate, serrulated. Branches terete. Brazil, 1894. Greenhouse shrub. (R. H. 1894, p. 304.)

E. Weinmannianum. The correct name is *E. macranthum.*

E. cordatum, E. megalophyllum, E. reticulatum, and *E. vernale* are also, or have been, in cultivation.

EUPETALUM. Included under **Begonia** (which *see*).

EUPHORBIA. Including *Dactylanthes.* To the species described on pp. 541-2, Vol. I., the following should be added:

E. canaliculata (channelled). A synonym of *Pedilanthus tithymaloides.*

E. carinata (keeled). A synonym of *Pedilanthus tithymaloides.*

E. Fournieri (Fournier's).* *fl.* white, small. *l.* roundish-ovate, 1ft. long, bright green, with silvery nerves; petioles reddish. Young plants having a fleshy, five-angled stem. Madagascar. A pretty, Cactus-like species.

E. heterophylla (variable-leaved). *fl.*, cymes or corymbs dense, involucred by bracts which are bright red at base. *l.* pandurate or variously shaped, petiolate. North and South America, 1889. Hardy annual.

E. Lathyris (Lathyris). Caper Spurge. *fl.*, umbels of three or four rays, once or twice forked; bracts large, ovate-lanceolate. Summer. *l.* opposite, 3in. to 4in. long, the upper ones broader. *h.* 3ft. or more. Europe (Britain), &c. An annual or biennial, often cultivated in cottage gardens.

E. marginata (margined). *fl.*, inflorescence umbel-like, with three dichotomous rays. September. *l.* sessile, ovate or oblong, acute, equal at base, entire; uppermost or floral ones having conspicuous white, petal-like margins, whorled or opposite. Stems stout, densely leafy, 2ft. to 3ft. high. North America, 1811. Hardy annual. SYN. *E. variegata* (B. M. 1747).

E. Sipolisii (Sipolis'). *fl.* small, disposed in sessile cymes. Stems erect, branching, winged, leafless, ¼in. in diameter. Brazil, 1893. Stove.

E. variegata (variegated). A synonym of *E. marginata.*

The following have also been introduced, among others: *E. pilulifera, E. plumeroides, E. procumbens* (SYN. *E. pugniformis*), and *E. stygiana.*

EUPHORIA (in part). Synonymous with **Nephelium** (which *see*).

EUPITHECIA RECTANGULATA. *See* **Green Pug Moth.**

EUPTERYX PICTA. *See* **Potato—Insect Pests.**

EUPYRENA. A synonym of **Timonius** (which *see*).

EURHOTIA. A synonym of **Cephaelis** (which *see*).

EUROTIA (from *euros, eurotos*, mould; the long, slender hairs on the bracts resemble mould overgrowing the plant). SYNS. *Ceratospermum* (of Persoon), *Guldenstædtia, Kraschenninikova.* ORD. *Chenopodiaceæ.* A small genus (three species) of small, hardy shrubs or herbs, natives of Western and Central Asia, North-west America, &c., closely allied to **Grayia** (which *see* for culture). Flowers minute; males densely spicate at the tips of the branchlets; females axillary. Fruit compressed. Leaves small, alternate or fascicled, obtuse, entire, with recurved margins. Only one of the species calls for description here.

E. lanata (woolly). *fr.* reddish; calyx (when fruiting) woolly-tomentose. *l.* narrow-linear, whitish-grey. Western North America, 1894. An erect shrub, with thickly-felted twigs.

EURYA. Flowers small, sessile or shortly pedunculate, fascicled or rarely solitary in the axils; sepals five, imbricated; petals five, imbricated, coalescing at base; stamens fifteen or less, rarely five. Leaves often crenate-serrated and glabrous. To the species described on p. 542, Vol. I., the following should be added:

E. vitiensis (Fiji). *fl.* small, axillary, unisexual, the males fascicled, the females usually in pairs. *l.* elliptic-lanceolate or oblong, serrulate, acuminate at both ends, shining. Fiji, 1887. Stove tree. A form of *E. japonica.*

E. Jacquemartii (R. H. 1869, p. 369), a Japanese species, has also been grown in Continental gardens.

EURYALE. *Anneslea* (of Roxburgh) is synonymous with this monotypic genus. Berries 2in. to 4in. in diameter; seeds varying in size from a Pea to a Cherry, much eaten in India when roasted.

EURYANDRA. A synonym of **Tetracera** (which *see*).

EURYANGIUM. Included under **Ferula** (which *see*).

EURYBIOPSIS. A synonym of **Vittadinia** (which *see*).

EURYCLES. Only the two species described on p. 542, Vol. I., are included in this genus. Flowers white, many in an umbel; stamens inserted at the throat of the tube, shorter than the sub-equal, ascending segments; filaments bordered in the lower half, united into a more or less distinct cup. Leaves broad, petiolate, with lax, arcuated main veins. Bulb tunicated.

E. sylvestris (wood-loving). The correct name of *E. amboinensis.*

EURYGANIA. Flowers rather large, disposed in axillary racemes or corymbs, rarely solitary, nodding or pendulous; calyx five-lobed or five-toothed; corolla terete, tubular, or conico-tubular, the limb contracted, five-lobed. Leaves alternate, thickly coriaceous, persistent, shortly petiolate, entire or obscurely serrated.

EURYOPS (from *euryops*, having large eyes; in allusion to the conspicuous flowers of some of the species). ORD. *Compositæ.* A genus embracing about twenty-seven species of mostly greenhouse or half-hardy, shrubby plants, allied to *Othonna*; one is found in Arabia and Abyssinia, and the rest are South African. Flower-heads yellow, heterogamous, radiate; pappus in many series, caducous, formed of rough bristles; disk florets tubular, five-toothed, perfect. Leaves alternate, often clustered, entire, incised, or pinnatisect. For culture, *see* **Othonna.**

E. abrotanifolius (Southernwood-leaved). *fl.-heads* on terminal peduncles three or four times longer than the leaves. January to March. *l.* 1in. to 2in. long, densely crowded, pinnati-partite; lobes mostly alternate, distant, entire, linear-filiform, spreading or recurved. *h.* 2ft. to 3ft. South Africa. A strong bush. SYN. *Othonna abrotanifolia* (B. R. 103; L. B. C. 1698).

E. pectinatus (comb-like). The correct name of *Othonna pectinata.*

E. virgineus (virgin-like). *fl.-heads* the size of peas; peduncles 1½in. long. October. *l.* sessile, crowded, ¼in. long, flat, cuneate, sharply and deeply three- to five-toothed. Branches long, slender. *h.* 1ft. to 2ft. South Africa, 1821. SYN. *Othonna flabellifolia* (L. B. C. 728).

EURYTHALIA. A synonym of **Gentiana** (which *see*).

EUSIPHO. A synonym of **Cyrtanthus** (which *see*).

EUSTEPHIA (from *eu*, well, and *stephos*, a crown; in allusion to the circle of stamens). ORD. *Amaryllideæ.* A monotypic genus. The species, *E. coccinea*, is the plant described on p. 89, Vol. III., as *Phædranassa rubro-viridis.*

EUSTOMA. SYN. *Urananthus* (in part). Corolla tube short, broadly campanulate, deeply five- or six-cleft, the lobes oblong or obovate, twisted; stamens five or six.

E. silenifolium (Silene-leaved). The correct name of *E. exaltatum.*

EUSTREPHUS BROWNII. A synonym of *E. latifolius.*

EUSTYLIS. A synonym of **Nemastylis** (which *see*).

EUTACTA. Included under **Araucaria** (which *see*).

EUTAXIA. Flowers axillary, solitary or in groups of two to four, often crowded at the tips of the branches. *E. empetrifolia* is the correct name of *Sclerothamnus microphyllus.*

EUTERPE. In addition to the species described on p. 543, Vol. I., *E. speciosa, E. stenophylla*, and *E. sylvestris* are grown in the Kew Collection, but are not generally cultivated in English gardens.

E. montana. The correct name is *Prestoea montana.*

EUTHAMIA. Included under **Solidago** (which *see*), the correct name of *E. graminifolia* being *S. lanceolata.*

EUTRIANA. A synonym of **Bouteloua** (which *see*).

EUXENIA. A synonym of **Podanthus** (which *see*), the correct name of *E. grata* being *P. ovatifolius.*

EUXOLUS. Included under **Amarantus** (which *see*).

EVALLARIA. A synonym of **Polygonatum** (which *see*).

EVANSIA. Included under **Iris** (which *see*).

EVEA. A synonym of **Cephaelis** (which *see*).

EVERGREEN. A term applied to certain subjects whose foliage does not decay in winter, or that remains in an Evergreen condition until the new foliage is developed.

EVERLASTING FLOWER. *See also* **Gnaphalium.**

EVESHAM MOTH. This name is sometimes used for the Winter Moth (*Cheimatobia brumata*). It is, however, an inappropriate one for so widespread a pest, and one quite as abundant elsewhere as in the particular locality suggested by the name Evesham.

EVODIA (from *evodia*, sweet scent; in allusion to the odour of the leaves). Including *Tetradium.* ORD. *Rutaceæ.* A genus embracing about twenty-two species of unarmed, stove, evergreen trees or shrubs, natives of tropical Asia, the Pacific and East African Islands, and Australia. Flowers small, in panicled, axillary cymes, unisexual; sepals four or five, imbricated; petals four or five, sessile; stamens four or five. Leaves opposite, simple, one- to three-foliolate, or impari-pinnate, quite entire. *E. triphylla* has been introduced, but is probably lost to cultivation.

E. fraxinifolia (Ash-leaved). The correct name of *Tetradium trichotomum.*

EVODIA (of Gærtner). A synonym of **Ravensara** (which *see*).

EVOLVULUS. SYNS. *Cladostyles, Meriana.* This genus includes about seventy species, mostly American. About a dozen have been introduced, but most of them are lost to cultivation.

EVOSMUS, or **EUOSMUS** (of Nuttall). Included under **Lindera** (which *see*).

EXACUM. *E. macranthum* is a form of *E. zeylanicum. E. viscosum* is now classed under **Ixanthus** (which *see*).

EXARRHENA (from *ex*, out, and *arren*, male; in allusion to the exserted stamens). ORD. *Boragineæ*. A small genus (five species) of greenhouse or half-hardy, annual or perennial herbs, natives of Australia and New Zealand. It was included by the authors of the "Genera Plantarum" under *Myosotis*; but Sir J. D. Hooker now regards it as distinct, remarking that "whereas the filaments in *Myosotis* are inserted in the throat of the corolla some way down below the glands at the mouth of the tube between which the anthers lie (or point), in *Exarrhena* the stamens are inserted at the mouth itself, between the glands, and are therefore wholly exserted." *M. macrantha*, the only species known to cultivation, is an erect, robust, half-hardy, sweet-scented, hispid-pilose herb, requiring cold-frame treatment and shade from bright sunlight, or the leaves will scorch.

E. macrantha (large-flowered). *fl.* yellow, ¼in. long, borne in terminal, bifurcate cymes; corolla twice as long as the calyx, the upper part funnel-shaped, the lobes broadly oblong, obtuse. September. *l.*, radical ones 2in. to 4in. long, oblong-lanceolate; cauline ones smaller, linear-oblong, obtuse. New Zealand, 1892. (B. M. 7291.)

EXCŒCARIA (from *excæco*, to blind; in allusion to the effect of the juice and of the smoke of burning branches on the eyes). SYN. *Commia*. ORD. *Euphorbiaceæ*. A genus embracing about thirty species of glabrous, stove trees or shrubs, with acrid, milky sap, natives of tropical Asia, Africa, and Australia. Flowers minute. Leaves alternate or opposite. One or two of the species have been introduced, but they are probably not now in cultivation.

EXOASCUS. A genus of destructive fungi, several members of which are responsible for malformations in various fruit and other trees. *E. cerasi* is responsible for the Witches Brooms of Cherry; *E. deformans* for the Curl of Peach-Trees; and *E. pruni* for the Bladder or Pocket Plums. They will be found described under their respective common names. There are many others found upon landscape trees, but those enumerated are economically the most important.

EXOBASIDIUM RHODODENDRI. *See* **Alpine Rose Gall.**

EXOCARP. The outer layer of a pericarp.

EXOCARPUS (from *exo*, outside, and *karpos*, fruit; in allusion to the fruit resting on an enlarged pedicel). SYNS. *Sarcocalyx*, *Xynophylla*. ORD. *Santalaceæ*. A genus embracing about a dozen species of greenhouse trees or shrubs; eight are Australian, and the rest are found in New Zealand, Norfolk Island, the Sandwich Islands, and Madagascar. Flowers minute, in small, axillary clusters. Leaves alternate or rarely opposite, often reduced to minute scales, or very deciduous, rarely larger and persistent. *E. cupressiformis* (R. G. 1888, p. 288, f. 60) has been introduced, but is of little horticultural value.

EXOCHORDA. *E. grandiflora* is sometimes used as a wall-plant, but it also succeeds when grown as an isolated specimen upon the lawn.

To the species described on p. 544, Vol. I., the following should be added:

E. Alberti (Albert's).* *fl.* white, inodorous, ¾in. across, borne in profusion; stamens grouped in five bundles. April and May. *fr.* very large. *l.* dark green, lanceolate, quite entire; those on the sterile branches slightly toothed and more acute. Bokhara, 1888. A handsome shrub. (R. H. 1891, p. 403.)

EXOTHOSTEMON. A synonym of **Prestonia** (which *see*).

EXTRA-TROPICAL. Living in regions beyond the tropics.

EYE CUTTINGS. A method of propagation frequently used for increasing the **Vine** (which *see*).

EYED HAWK-MOTH. *See* **Sphingidæ**, Vol. III.

EYREA. A synonym of **Turpinia** (which *see*).

EYSENHARDTIA. SYNS. *Varennea*, *Viborquia*. Flowers white, small, densely spicate-racemose. Leaves impari-pinnate; leaflets numerous, small.

FABA. The correct name of *F. vulgaris* is *Vicia Faba*.

FABAGO. Included under **Zygophyllum** (which *see*), the correct name of *F. major* being *Z. Fabago*.

FABRICIA (of Adanson). A synonym of **Lavandula** (which *see*).

FABRICIA (of Thunberg). A synonym of **Curculigo** (which *see*).

FIG. 379. FADYENIA PROLIFERA.

FADYENIA. *F. prolifera* (Fig. 379) is an eccentric-looking little Fern, but so thoroughly distinct from any other known species that no mistake as regards its classification can possibly be made by anyone who has seen it once. It is usually considered difficult to manage, yet it is free growing when kept under suitable conditions: these consist of heat, moisture, and permanent shade. It succeeds well in a compost of three parts fibrous peat and one part sand, with abundant moisture at the roots. Under such treatment it not only flourishes, but rapidly spreads in all directions, through the rooting of the proliferous extremities of its barren fronds, where the young plants thus produced (and without being disconnected from the parent plant) in turn yield subjects having all the characters of a fully-developed specimen.

FADYENIA (of Endlicher). Included under **Garrya** (which *see*).

FAGARA. Included under **Xanthoxylum** (which *see*).

FAGOPYRUM. *F. esculentum emarginatum* and *F. tataricum* are grown on the Continent.

FAGRÆA IMPERIALIS. A synonym of *F. auriculata.*

FAGUS. Beech trees are very liable to be attacked by the wound parasite, *Nectria ditissima*, described and illustrated under **Canker** in the present volume. The treatment there suggested should be followed.

Another wound-fungus is known as *Polyporus* (*Fomes*) *fomentarius*, or Tinder Fungus. The sporophores resemble the hoofs of horses, and are brownish at first, becoming greyish. At one time tinder was prepared from this species, the central portion of the sporophore being utilised. Many kinds of articles of wear have been manufactured from the Tinder Fungus. The sporophores should always be carefully removed from trees, and the part coated with tar. In bad cases nothing short of burning the tree will suffice.

To seedling Beeches there is a species of Mildew (*Phytophthora omnivora*), which proves exceedingly destructive. Though by no means confined to the genus *Fagus*, yet it is perhaps oftenest noticed in connection therewith. The seedlings show very characteristic dark blotches on the leaves; but sometimes the stems are also involved. Nothing short of removing all seedlings showing these blotches is of any use. Beds to which sun cannot penetrate are oftenest attacked, the conditions being more favourable for the development of the parasite. The disease is tided over by means of oospores.

To the species described on p. 2, Vol. II., the following varieties should be added:

F. americana (American). A synonym of *F. ferruginea.*

F. betuloides. The garden varieties *latifolia* (broad-leaved) and *macrophylla* (large-leaved) are in the Kew Collection.

F. rotundifolia (round-leaved). A form of *F. sylvatica.*

F. sylvatica atropurpurea Rohani (Rohan's dark purple). *l.* similar to those of the Fern-leaved Beech in form, but like those of the Copper Beech (*F. s. cuprea*) in colour. 1894. A garden form.

F. s. foliis-striatis (having striped leaves). This variety is said to have been discovered, in 1892, in a forest in Hessia. "Soon after opening the leaves show a regular golden striation, parallel with the nerves, and this striking appearance lasts till they fall off."

F. s. roseo-marginata (rosy-margined). *l.*, young ones edged with pink. 1883.

F. s. rotundifolia (round-leaved). *l.* roundish, closely set on the twigs. 1894. A distinct form, of upright growth.

F. s. tricolor (three-coloured). *l.* dark purplish-green, spotted with bright carmine-rose, and shaded with rosy-white. 1885. An ornamental garden variety.

F. s. Zlatia (Zlatia). A variety with golden-tinted leaves. 1892.

FALKIA. Flowers small or mediocre, solitary, shortly pedunculate; sepals five, imbricated; corolla broadly campanulate, the limb five-angled or five-lobed. Leaves cordate, ovate, orbicular, or reniform, small.

FALLOWING. Except in the case of foul land, Fallowing is not an advisable operation in the garden, as it means the loss of a season's crop. The system of Fallowing is to deeply work the soil several times during the summer months, destroying the weeds, and afterwards expose it to the weather as much as possible. Usually the soil is much poorer after the Fallowing, as being bare, or having had no crop during the year, no nitrogen will have been absorbed from the atmosphere.

FALSE. Similar in appearance only.

FALSE ASPHODEL. *See* **Tofieldia.**

FALSE BUGBANE. *See* **Trautvetteria palmata.**

FALSE HELLEBORE. *See* **Veratrum.**

FALSE MITREWORT. *See* **Tiarella cordifolia.**

FALSE RHUBARB. *See* **Thalictrum flavum.**

FALSE SANDALWOOD. *See* **Ximenia americana.**

FALSE TINDER FUNGUS. *See* **Polyporus,** Vol. III.

FAMILY. Specifically, a group of plants more comprehensive than a genus, but less so than an order. The word is, however, often used as a synonym of order; *e.g.*, ORD. *Cactaceæ*, the Cactus Family.

FARADAYA (named in honour of Michael Faraday, the celebrated chemist, 1791-1867). ORD. *Verbenaceæ.* A small genus (about four species) of stove or greenhouse, tall-climbing, glabrous shrubs, natives of Australia, Fiji, New Guinea, &c. Flowers white, showy; calyx at first closed, ultimately cut into two or three valvate lobes; corolla tube exserted, enlarged above, the limb ample, spreading, four-cleft; stamens four, long-exserted; cymes many-flowered, disposed in a terminal, loosely corymbose panicle, or sessile at the nodes. Leaves opposite, entire, coriaceous. Two species are in cultivation. They thrive in a rich loam, and require plenty of root room. The branches should be allowed to spread close to the glass, in as light a position in the stove as possible.

F. papuana (Papuan). *fl.* salver-shaped, disposed in corymbose panicles. *l.* lanceolate, bullate. Java, 1884.

F. splendida (splendid). *fl.* large, in a terminal, corymbose panicle; calyx segments eight to ten lines long; corolla tube above 1in. long, the lobes flat, nearly ¾in. long. *l.* ovate, acuminate, rounded or cordate at the base, 6in. to nearly 12in. long, prominently penniveined; petioles 1in. to 2in. long. Queensland. A tall, woody climber.

FARAMEA. SYN. *Antoniana.* Flowers white; inflorescence terminal, variable; calyx limb cup-shaped or almost tubular; corolla funnel-shaped or tubular, the lobes spreading or recurved; stamens four. Leaves opposite, coriaceous or membranous, usually oblong or lanceolate.

FARFUGIUM is included by Bentham and Hooker under **Senecio** (which *see*).

FARINA. This name is often applied to the **Pollen** (which *see*) of a flower.

FARMYARD AND STABLE MANURE. This substance differs from all artificial manures, and in several important particulars. Its value depends, first, on the materials of which it is formed; secondly, on the condition of its formation; and, thirdly, on the way it has been kept and treated until it is applied to the soil.

The materials of Farmyard or Stable Manure are litter and the excreta of animals. That produced from young growing stock, or from milch cows, is not so good as that produced from old, or fattening animals. Then, again, that which is produced from underfed animals is of a very inferior description. Further, the composition of the excreta of domestic animals of various kinds is different. The excrements of horses, which are fed with a more nitrogenised food than most other animals of the farm, are of a very fertilising and valuable character. The excrements of farm animals may be placed in the following order of manurial value: Horse-dung and sheep-dung are about equal; then dung from oxen and cow-dung; and, last, pig-dung. The dung of horses and sheep yields hotter and more rapidly-fermenting material than does the dung of oxen, cows, or pigs.

Farmyard or Stable Manure is said to be a perfect fertiliser, because it contains all the elements necessary for supporting a healthy and vigorous growth of plants. It is a universal manure, because it universally produces these effects upon a great variety of soils and upon most descriptions of garden products.

Another reason why it is so valuable is that it produces mechanical effects in the soil to which it is applied, from its mass of organic matter, which no artificial manure can accomplish. The important mechanical effects, especially of long dung on clay soils, are not to be underrated. Then, again, the vast amount of heat developed during the decomposition of dung is of immense value to the gardener for forcing purposes, and this cannot be attained by other chemical agents.

Further, Farmyard and Stable Manures furnish available humus and a mulch if they are spread upon the surface of the soil; they also tend to increase the water-holding power of the soil, and to improve its texture and physical condition. It may here be stated that, so far as the humus matter of dung is beneficial to vegetation, it is only by its oxidation and nitrification, and a consequent supply of carbonic acid within the soil—a source of immense importance in the early stages of the life of a plant, and before it has developed

Farmyard and Stable Manure—*continued.*

and exposed a sufficient amount of green-leaf surface to the atmosphere to render it independent of soil supplies of carbonic acid.

In many cases it is believed that these benefits are a full equivalent for the less soluble characters of the fertilising constituents of Farmyard or Stable Manure, as compared with commercial fertilisers. When the soil has a reasonable amount of available plant-food within it, the foregoing statement may be correct; but as the ultimate welfare of garden plants depends so much on a healthy and vigorous start, with an abundant root-development, it becomes a question whether the more quickly-acting commercial manures may not be more valuable than the slowly-acting animal manures, whenever the soil is deficient in readily available plant-food. Then, again, Farmyard Manure, with its slow, nitrifying properties, may furnish sufficient nitrogenous food for all late crops in the garden, or those having a long period of growth; but for early crops or very rapidly-growing plants some easily soluble nitrogenous manure, such as guano, nitrate of soda, sulphate of ammonia, &c., will be found of great advantage. A ton of Farmyard or Stable Manure, when applied to the soil, will add about 605lb. of organic matter, which will yield from 9lb. to 15lb. of nitrogen. But the large amount of carbon in combination with the nitrogen causes it to nitrify with comparative slowness, and the nitrifying process is essential before dung becomes available for plants. The ton of dung will also add 67lb. of ash or mineral constituents, supplying from 4lb. to 10lb. of phosphoric acid, and from 5lb. to 13lb. of potash.

In some experiments of Sir John Lawes, at Rothamsted, Hertfordshire, with Potatoes grown year after year on the same land, it was shown that in the first year of the application of 14 tons of Farmyard Manure per acre an increase of 8 cwt. of Potatoes only was obtained over the plot which received no manure at all; while in the next four years of the application of the same quantity of Farmyard Manure the increase of Potatoes averaged 2 tons 17 cwt. per acre over the unmanured plot, pointing clearly to the slow action of the dung, and showing that it rarely produces much effect in the first year of its application.

Further, it was found that when 200lb. of nitrogen was applied to the Potato crop in the form of Farmyard Manure, which also contributed a very large amount of mineral constituents, in no case was the increased yield of the crop so great as was obtained by an artificial mixture of minerals and nitrogenous manure supplying only 86lb. of nitrogen, but in a more readily available condition. Nor was the increased assimilation of any one of the individual constituents so great under the influence of Farmyard Manure as when these were applied in the rapidly available condition, as in the artificial mixtures.

In the case of several other crops it has also been found that only a small proportion of the nitrogen of Farmyard Manure was taken up in the first year of the application.

In ordinary garden practice Farmyard and Stable Manure are not only largely relied upon for the growth of most crops, but are applied in considerable quantities. It is probable, therefore, that independently of the liberal supply of all necessary constituents of plant-food, the beneficial effects of this manure are in a considerable degree due to its influence on the mechanical condition of the soil, rendering it more porous and easily permeable to the surface-roots, upon the development of which the success of so many garden plants greatly depends. Then, again, something may be due to an increased temperature of the surface-soil, engendered by the decomposition of so large an amount of organic matter within it; whilst the carbonic acid evolved in the decomposition will, with the aid of moisture, serve to render the mineral resources of the soil more soluble.

There are several practical considerations which count in favour of using well-rotted manures, especially when not used in conjunction with an artificial fertiliser. It is especially worthy of observation that, whilst the insoluble organic matter of dung is much reduced in quantity during the fermentation, the insoluble organic matter which remains is richer in nitrogen than an equal quantity of the same substance from fresh dung. Therefore, weight for weight, well-rotted Farmyard Manure is richer in soluble fertilising constituents than fresh dung, and contains especially more readily available nitrogen, and hence produces a more immediate and powerful effect on vegetation. Many practical gardeners have urged that fresh manure, even if it does not actually injure the crop to which

Farmyard and Stable Manure—*continued.*

it is applied, may still tend to the production of stems and leaves rather than of seeds and fruits. The rankness, however, of fresh dung and urine could be controlled and utilised by applying the manure in small quantities, and supplementing it with artificial fertilisers of kinds appropriate to the crops or individual plants that are to be grown. *See also* **Animal Manures.**

FARNESIA. Included under **Acacia** (which *see*).

FASCIATION. A condition consisting of a banding together of stems and inflorescences, or of a lateral widening and banding of the former, as in the case of the Garden Cockscomb. Recently some interesting experiments have been conducted by M. L. Geneau de Lamarlière with the object of producing Fasciation in the stems and inflorescences of plants. *Barkhausia taraxacifolia* was the species selected experimentally for producing the desired malformations. It was found that mutilations practised upon the principal stems and branches favoured the formation and development of dormant abnormal buds, and thus gave rise to branches and inflorescences more or less Fasciated. Mutilation of the principal axes, then, we are told, is a cause of teratological growths; an indirect cause certainly, but none the less effectual.

FATSIA. Only three species are included in this genus—those described on p. 3, Vol. II. Flowers hermaphrodite or polygamous; petals four to six, membranous, valvate; stamens four to six; filaments filiform; umbellets paniculate or racemose, all perfect, or the lateral ones male. Leaves ample, palmately cleft, glabrous, bristly, or woolly beneath.

F. japonica is one of the best of room plants if its foliage be kept free from dust and due attention be paid to watering in late spring and early summer. Where so many fail with this plant in rooms is in assigning it a sunny position. It is a shade lover, and this cannot be too well remembered.

FEABERRY. A name locally applied to the **Gooseberry** (which *see*).

FEDIA. To the species described on p. 4, Vol. II., the following varieties should be added:

F. Cornucopiæ candidissima (whitish). This variety differs from the type and from *floribunda-plena* in having white flowers. 1885.

F. C. floribunda-plena (abundantly double flowered). A handsome, tufted variety, producing its pretty, reddish-pink, double flowers in such profusion as to almost entirely hide the leaves. 1886. (R. G. 1218.)

FEDIA (of Adanson). A synonym of **Patrinia** (which *see*).

FEDIA (of Gærtner). In part synonymous with **Valerianella** (which *see*).

FEIJOA (named in honour of Don J. da Silva Feijo, Director of the Natural History Museum at San Sebastian). SYN. *Orthostemon.* ORD. *Myrtaceæ.* A small genus (two species) of stove or greenhouse shrubs, natives of Brazil, and only distinguished from *Psidium* in the elongated ovary, in the filaments being erect in bud (in which it differs from all other plants of the order), and in the hairy anthers. *F. Sellowiana*, the only species introduced, probably requires warm greenhouse treatment, and may perhaps be increased by layering.

F. Sellowiana (Sellow's). *fl.* solitary, axillary; petals fawn-coloured outside, purplish-crimson within. *fr.* yellowish-green, egg-shaped, Guava-like, richly perfumed, and of a "delicious, aromatic, spicy" flavour. *l.* 2in. to 3in. long, opposite, shortly petiolate, oblong, obtuse, deep green, shining. 1893. An erect shrub or small tree. (B. M. 7620; G. C. 1893, ii., p. 451, f. 134-5; R. H. 1893, p. 264.)

FELICIA. Including *Agathæa* (in part, not *A. sylvestris*). To the species described on p. 4, Vol. II., the following should be added:

F. abyssinica (Abyssinian). *fl.-heads* lilac, hemispherical, solitary, terminal, on peduncles 1in. to 2in. long. *l.* closely alternate, linear, sessile, entire or minutely setulose-ciliated, ¼in. to ¾in. long. *h.* 4in. to 12in. Tropical Africa, 1896. A tufted, half-hardy, much-branched shrub.

F. fragilis (fragile). *fl.-heads* of a pale violet-blue with a yellow centre, about ½in. in diameter. July to September.

Felicia—*continued.*

l. narrow-linear, hard-tipped, usually rigidly ciliated. Stems dwarf, slender. South Africa, 1759. Half-hardy annual or biennial, becoming shrubby at base; useful as a carpet plant to show up bright-flowering subjects. SYNS. *F. tenella*, *Aster tenellus* (B. M., t. 33).

F. fruticosa. According to the "Index Kewensis," this is once again classed under *Aster*.

F. tenella (rather tender). A synonym of *C. fragilis*.

FENDLERA (commemorative of Auguste Fendler, one of the first botanists who visited New Mexico). ORD. *Saxifrageæ*. A monotypic genus. The species is a hardy or half-hardy, erect, deciduous, pubescent-pilose or glabrous shrub, with terete, striated branches. It does well in any ordinary soil if afforded the protection of a wall in other than Southern districts. Propagation may be effected by seeds, by cuttings, or by layers.

F. rupicola (rock-loving). *fl.* white, large and showy, pedunculate, terminal, one to three on the short branchlets; calyx eight-ribbed; petals four, clawed; stamens eight, long. *l.* opposite, lin. long, sub-sessile, oblong, entire, three-nerved. *h.* 2ft. to 4ft. Texas and New Mexico, 1888. (R. H. 1891, f. 12.)

FENUSA ULMI. *See* **Sawflies.**

FERDINANDA. The species formerly classed under this generic name are now referred to **Podachænium** and **Zaluzania** (which *see*).

FERNANDEZIA (of Lindley). This genus (p. 4, Vol. II.) is now merged into **Lockhartia** (which *see*).

FERNANDEZIA (of Ruiz and Pavon). A synonym of **Dichæa** (which *see*).

FERN RUE. *See* **Thalictrum flavum.**

FERNS. Amongst the most striking points in connection with Ferns is the extremely wide range of their geographical distribution. From the Tropics, where they exist in profusion, to the Arctic regions, as far north as Greenland, Ferns are found in greater or less quantities, some

Ferns—*continued.*

at an altitude varying from 10,000ft. to 12,000ft., and others at the sea-level, which indicates that, in artificial culture, while certain kinds are perfectly hardy in this country, others require the protection of the warm house. In their native habitats, certain exotic species affect the most exposed and sunny situations, much in the same way as the Scale Fern (*Ceterach officinarum*), the Maidenhair Spleenwort (*Asplenium Trichomanes*), and the Wall Rue (*Asplenium ruta-muraria*) do in this country. Others only thrive under the influence of dense shade; while others, again, require constant moisture at the roots, with their heads in full exposure to the action of the light, just as is the case with some of our common British species.

Another important feature in connection with Ferns in general is the singularly cosmopolitan character possessed by certain kinds which, though generally given and accepted as being of British origin, are also found wild in various, and, in some cases, in very distant parts of the

FIG. 380. THE FERNERY, NASH COURT, FAVERSHAM.

Globe. Thus most of our Spleenworts, or Asplenums, are also found throughout the European Continent, Northern Asia, North and South Africa, in North America, in various parts of India, &c. The same may also be said of our common Maidenhair Fern (*Adiantum Capillus-Veneris*), which is found wild nearly all over the world. Even our own Royal Fern (*Osmunda regalis*) is found growing plentifully on the banks of rivers and streams on the Neilgherries and other high mountains in India, while the common Shield Ferns, *Polystichum angulare*, *Lastrea spinulosa*, and others, are also natives of many parts of India and of North America. Yet another example of the cosmopolitan character of Ferns is well shown in the delightful violet-scented, small-growing *Lastrea fragrans*, which, although originally introduced into this country from North America, is found to be abundant on some of the Japanese mountains.

It is remarkable also that, to a certain extent, each country appears to produce Ferns forming natural special

Ferns—*continued.*

sections. Thus, we find that North America supplies us with species mostly of a deciduous character, from the tiny-growing *Pellæa Breweri* to the gigantic *Struthiopteris pennsylvanica*, *Onoclea sensibilis*, *Adiantum pedatum*, various *Osmunda*, *Dicksonia punctilobula*, and *Woodsia areolata*. It is from Japan that, on the contrary, the

Ferns—*continued.*

Tree-Ferns found in the East and West Indies and South America are, with a few exceptions, conspicuous by their comparatively slender stems, whereas those, or most of those, native of New Zealand, Australia, and Tasmania, have stems of a comparatively thick nature, such as those of the deservedly-popular *Dicksonia antarctica*, of the

FIG. 331. WELL-GROWN FERNS (in House in Mr. H. B. May's Nursery, Upper Edmonton).

greatest part of the hardy and semi-hardy evergreen kinds are native. We note among the most popular species such general favourites as *Cyrtomium falcatum* and *C. anomophyllum*, *Lastrea atrata*, *L. opaca*, *Polystichum setosum*, and *P. Tsus-Simense*, all of which are not only evergreen, but have a peculiarly glossy appearance and leathery texture—characters which are shared by very few of our native Ferns and by scarcely any other exotic kinds.

Silver Tree-Fern, *Cyathea dealbata*, *C. medullaris*, and a few others.

It is worthy of notice that the powers of producing crested, depauperated, and other characters peculiar to forms of original species, either of a deciduous or of an evergreen nature, is much more developed among Ferns growing spontaneously in England than among those found in any other country, as it is a fact that scarcely a single

Ferns—*continued.*

species of Fern native of the British Isles has retained its normal characters throughout: all have become more or less addicted to variations. That power of producing variable forms, either due to the influence of the atmosphere or to other causes, can hardly be ascribed to the effects of cultivation, as most of the crested, undulated, multifid, and other forms of *Lastrea Filix-mas*, *Athyrium Filix-fœmina*, *Polypodium vulgare*, *Polystichum angulare*, and *Scolopendrium vulgare* have usually been met with in a wild state in some part or other of the United Kingdom. Even the production of the crested forms of exotic species, such as Adiantums, Gymnogrammes, and Pteris may be said to be a monopoly of this country.

Like any other order of plants, Ferns have their pigmies as well as their giants, but the differences as regards dimensions are much more marked in them than in most if not in all others. While some of the gigantic Tree-Ferns attain some 50ft. in height, others seldom exceed a few inches; and, as regards the fronds themselves, although in the case of certain Polypodiums, Trichomanes, and others, these are only an inch or even less in length, in others they reach fully 15ft. Again, some kinds affect a bushy and symmetrical form, whereas others are provided with rhizomes or stems which naturally grow many yards in length, twining round other plants or climbing to the top of tall trees.

Although in the majority of cases their foliage is of a uniform green colour, yet, either in the course of development or when fully matured, their fronds, in some cases entire, and in others more or less finely divided, exhibit a most extensive variety of shades, ranging from the dark colour peculiar to the Hard Fern, *Blechnum Spicant*, or to the Soft Prickly Shield Fern, *Polystichum angulare*, to the soft pea-green tint of our common Oak Fern, *Polypodium Dryopteris*, or the lovely *Adiantum trapeziforme*. Others, like the common *Polypodium aureum*, a deservedly popular strong-growing kind, or the small, dwarf-growing *P. glaucophyllum*, retain all through their existence a pleasing bluish tint which forcibly reminds one of the foliage of *Eucalyptus globulus*. Others, again, although quite green when mature, are, during their development, of most brilliant bronzy or metallic tints. This peculiar character is particularly noticeable among the Adiantums, some of which, like *A. Veitchii*, *rubellum*, *tinctum*, *macrophyllum*, and others, are endowed with most gorgeous hues, turning from a delicate pink to a bright magenta, and finally changing to a glaucous green tint of exquisite softness, before taking the uniform and permanent green colour which they retain to the end of their existence. The same changes of colours also apply to *Blechnum occidentale*, *Doodia media*, and *D. aspera multifida*, to the striking *Didymochlæna truncatula*, the ever-charming dwarf-growing *Lomaria L'Herminieri*, the handsome, large-growing *Davallia polyantha*, and many other species of small or large habit. To those who might object that the variations in colour above referred to only belong to the early part of the vegetation of the plants, it may be answered that, as Ferns of an evergreen nature are growing nearly all the year round, the objection is not of great consequence, as there is always a variety of colour to be seen and admired wherever a certain quantity of these plants are grown.

Ferns for purposes of culture may be divided into two broad sections—hardy and exotic, the former in this country succeeding out of doors, and the latter requiring glass protection (see Figs. 380 and 381).

HARDY FERNS. There are many places in gardens where flowering plants cannot live, and these are well adapted for the cultivation of Ferns. Whenever practicable, the Hardy Fernery should be situated in a naturally moist and cool spot, and, strong light being in most cases objectionable, the neighbourhood of tall, deciduous trees should have preference over all other places, as in this case the plants would be little exposed to the sun, and protected from strong winds. A position with a north aspect is the one most suitable, the plants having then a maximum of light without being spoilt by the sun. The Hardy Fernery should be constructed of stone, in the form of rockwork, either on the level ground or as a ravine, excavated to a greater or less depth. In whatever form the Fernery is arranged, drainage is of the utmost importance, and should be provided for the ready escape of surplus moisture. It should be borne in mind that, in the formation

Ferns—*continued.*

of the Outdoor Fernery, it is most essential to study the requirements and comfort of the plants in preference to showing the building of the rockwork, and to provide against the disastrous effects of high winds, which are injurious to all Ferns. Besides the friendly shelter of neighbouring trees, as stated elsewhere, the tenderest kinds may also be protected by the judicious grouping of the more robust sorts, which, when planted in masses, considerably help in procuring the comfort necessary to the well-being of the smaller and more delicate species.

In planting the Hardy Fernery, the distribution of the evergreen and of the naturally deciduous species should be carefully considered, and the plants arranged in such a way as to avoid at any time a bare appearance, and allow the whole place to remain covered with foliage during the resting season. The introduction of North American and certain Japanese Ferns, which have proved quite hardy under our climate, has materially added to the great diversity of size and habit as represented by the British species and their numerous varieties.

The planting of the Hardy Fernery may safely take place at any time from October to March; but if it is tolerably sheltered it is preferable to plant in autumn, as root-action in most hardy Ferns commences long before there are any visible signs of vegetation, and in that case the plants moved in the autumn will, if kept sufficiently moist during the winter, make a quantity of fresh roots, upon which the new growth is mostly dependent. If, however, the place where the Hardy Fernery is situated is exposed, it is preferable to plant only in the spring, and just before vegetation commences, say about the end of March, as the plants are then full of vigour, the ascension of sap enabling them to take every advantage of the new soil, the nutritive properties of which are readily assimilated by the roots. Special attention to the nature of the plants employed in the plantation of the Hardy Fernery is indispensable, and of much greater consequence than the preparation of the compost or material in which the plants are to grow, and which, for general purposes, consists of two parts of fibrous loam, one part of half-decayed leaf-mould, and one part of coarse silver-sand.

An attempt has been made to place in their respective positions the British and the hardy exotic Ferns, according to their dimensions, and it is hoped that it will serve as a guide to amateurs intending to plant a collection of Ferns out of doors. With a view to insuring each plant a position suitable to its requirements, we have marked with an asterisk (*) the kinds requiring more than ordinary moisture at the roots, and with a dagger (†) those kinds which prefer a somewhat exposed and airy situation; all others thrive in naturally shady and moist places, as previously stated.

Dwarf species and varieties growing from 4in. to 12in. high: *Allosorus crispus* and *A. acrostichoides*; the various Spleenworts, such as *Asplenium Adiantum-nigrum*, *ebenum*, *fontanum**, *lanceolatum*, *Ruta-muraria*†, *Trichomanes*†, *viride*; several prettily-crested forms of the Lady Fern, *Athyrium Filix-fœmina*; *Blechnum Spicant*; *Ceterach officinarum*†; *Cystopteris fragilis*, *Dickieana*, and *montana*†; a few varieties of the Male Fern, *Lastrea Filix-mas*; *Lomaria alpina*; the Oak, Beech, and Limestone Polypodies, *Polypodium Dryopteris*, *Phegopteris*, and *calcareum*; *Polypodium vulgare*† and varieties; several handsome forms of *Polystichum* (*Aspidium*), including the Holly Fern, *P. Lonchitis*; numerous forms of the Common Hart's-tongue, *Scolopendrium vulgare**; and *Woodsia glabella*, *ilvensis*, and *obtusa*.

Among the medium-sized species and varieties, growing from 12in. to 24in. in height, we particularly note: *Aspidium cristatum*† and *A. noveboracense*; *Dicksonia punctilobula*; several handsome varieties of the Lady Fern and also of the Male Fern; *Lastrea intermedia*, *marginale*, *æmula*, *montana*†, *Thelypteris**; the Welsh Polypody, *P. cambricum*; and several pretty forms of *Polystichum angulare*, *Scolopendrium vulgare**, and *Woodwardia virginica**.

The principal and most ornamental species and varieties growing 2ft. and upwards are: *Athyrium Michauxii* and several varieties of *A. Filix-fœmina*, such as *Howardæ*, *Grantæ*, *Elworthii*, *plumosum*, *setigerum*, *todeoides*, &c.; *Lastrea Goldieana*, and several varieties of *L. Filix-mas*, such as *Bollandiæ*, *Barnesii*, *grandiceps*, *Ingramii*, *lineare*, &c.; also *Lastrea dilatata* and its several crested varieties. The North American *Onocleæ sensibilis** and *Osmunda cinnamomea**, *interrupta**, *gracilis**, as well as

Ferns—*continued.*

the British *Osmunda regalis* and *regalis cristata**, are among the most distinct of all known Ferns. Very interesting also are *Aspidium* (*Polystichum*) *munitum* and the beautiful varieties of *angulare*, such as *divisilobum*, *multilobum*, *proliferum Crawfordianum*, *Lomaria chilensis*, *Pteris aquilina*, and *Struthiopteris pennsylvanica**, which grows very luxuriantly, and attains a large size when planted in a damp, shaded, and sheltered position.

When a Hardy Fernery is once established, very little attention is required to keep it in good order. The whole work in connection with such a place is limited to occasional waterings during the summer, while during the winter a slight covering of old leaves or other light material placed over the plants will enable the tenderer sorts to withstand the rigour of our most severe winters.

REPOTTING FERNS. This is an operation of great importance, and the principal points to be observed are that they should not on any account be over-potted, and that special care should be taken to prevent the roots of the plants from being torn away or broken off. Over-potting is undoubtedly a frequent cause of loss of Ferns, and should always be avoided. Although a hard-and-fast rule as to the dimensions of the pots to be used cannot possibly be laid down, it is well to remember that by far the better plan is to repot several times, as required, giving a slightly larger pot each time, than to put plants into much larger pots with the object of saving labour, or the trouble of repotting in a month or two. Through successive repottings the plants derive from each additional supply of new soil the full amount of the nutritive properties it possesses, while over-potting frequently causes sickness. Healthy well-rooted plants may safely be repotted as follow: from 3in. pots to 4½in. pots, from 4½in. pots to 6in. pots, from 6in. pots to 8in. pots, from 8in. pots to 10in. pots, from 10in. pots to 13in. pots, and so on. Ferns require repotting less frequently the larger they become, and the larger the pots are in which they growing; they also should be repotted more or less frequently, according to their nature and to their power of growth. It is well known among practical men that these plants make their hardiest and most luxuriant growth when the inside surface of their pots is already covered with a network of roots.

When proper attention is given to Ferns after repotting, this operation may safely be performed at almost any time of the year; but, generally speaking, it is preferable to commence in the warm house about the beginning of February, and in the cool house about the beginning of March. In every case it is most advisable to have the plants repotted as they start into new growth. This operation may be continued through spring and summer, but it is best to cease about the middle of September, as little growth is made after that time, and the addition of new soil, even if not injurious to the plants, is of very little use, as its nutritive properties are washed out before the spring by the repeated waterings the plants require in the meantime. It is not advisable to put into larger pots plants with roots matted together in a hard mass until they have been carefully loosened as much as it can be done with safety. When the roots have filled the bottom of the pots, and have become thickly matted among the crocks, it is best to repot without disturbing them, leaving the crocks in, for it is certain that, if for the sake of removing the crocks the roots are torn away, the plants will be deprived of the best part of their feeders, and will suffer accordingly. Large plants should be examined and repotted if they require it, but there is no necessity for repotting them every year; indeed, in many cases it is advisable not to do so, although small plants benefit by being repotted several times during the year, because in the growing season, under favourable conditions, they make fresh roots very rapidly.

On account of the extremely sensitive nature of their roots, Ferns should preferably be potted in old pots; these, when used, should be clean and dry, so as to prevent, whenever the plants are to be repotted, the breaking of their roots, which is bound to happen if the plants have been previously potted in wet or dirty pots, to the sides of which the roots will be found to strongly adhere. Whenever new pots are to be used, it is advisable to have these put in water, in which they should remain until they are thoroughly soaked, and then be well dried before using; it is well known that pots fresh from the kiln absorb a great quantity of water, and when their pores are not previously filled it very frequently happens that the first two or three

Ferns—*continued.*

waterings, instead of being beneficial to the plants, only serve to soak the pots, while the balls of soil which the latter contain become so dry that it is often most difficult afterwards to get them into a moist condition.

Great care must always be taken that the plants when repotted are sufficiently moist at the roots, which organs are exceedingly sensitive to even a temporary absence of moisture. When a Fern has suffered from want of water at the roots, the effect is shown by the shrivelling of the fronds, the older ones being usually affected before the young growths. This is a peculiarity well worthy of special notice; for while in the case of most other plants, either of a herbaceous or of a woody texture, the temporary flagging of the foliage is efficiently remedied by an ordinary watering, or, at the most, by a thorough soaking of the roots, such treatment has no apparent effect on the roots of most Ferns, and very few indeed are the species whose fronds, having once flagged, regain their elasticity by the application of water at the roots or over the foliage; the Nothoclænas and the Cheilanthes are the Ferns which show the least the effects of drought at the roots.

In growing Ferns in pots it will be found greatly beneficial to the plants that these should stand on a solid, cool, moist bottom, and the ordinary stage or shelf can hardly correspond to the requirements of the plants. The most suitable material on which to place Ferns in general is a solid bed of ashes or one of sand covered with a layer of coal-cinders, which have the property of remaining fresh and sweet for an indefinite time. Wherever practicable, the houses in which Ferns are intended to be grown in pots should be comparatively low structures, sunk 15in. or 18in. below the surface of the ground, and provided with solid beds, bricked on their vertical outer surface. The walks should be made either of coarse gravel, or of the natural earth, if of a sandy nature, simply covered with a thickness of 2in. or 3in. of coal-cinders, these being the most porous, and at the same time the best moisture-retaining materials that can be used in a house in which constant humidity is of the utmost importance.

GROWING FERNS IN PANS. Besides pot culture, pure and simple, there are several other equally practical ways of growing Ferns, some of which have been devised by the cultivator to render the plants more attractive by presenting them under their most favourable aspect, while others have been suggested to him by the nature of the plants under his care.

Besides the hanging-basket, already noted in Vol. I., there is the shallow pan. Both methods offer to certain species advantages which they could not obtain if grown in the time-honoured conventional flower-pot. The shallow pan is especially useful for the culture of most Ferns provided with running rhizomes. These organs, in a few instances, prefer being kept underground, but, in most cases, they delight in running over the surface of the soil, to which they should from time to time be carefully fastened down by means of small wooden pegs, which are useful until the rhizomes have produced sufficient roots to keep themselves in position, when the pegs may be entirely dispensed with. As the plants grow, and the rhizomes extend, they are apt to come over the sides of the pans; for the welfare of the plants this must be prevented, and it is easily done by carefully turning them inside the pans and pegging them securely on to the soil. Under these conditions, the rhizomes producing fresh roots all along their length add strength to the plant, whereas, when they extend over the sides of the pan and out of the damp soil or moss, they seldom produce any roots, and have to be supported by the plant instead of helping it, and the results are anything but satisfactory. When used, the pans, like the pots, must be clean and dry. Drainage is an essential point; the holes should be covered with large crocks, which should be covered with either moss or rough peat; this, again, should be covered with a layer of very rough compost, higher in the middle than at the sides; then the pan should be filled to a sufficient depth with finer material until there is enough to plant the Ferns. The principal thing is to have the work firmly done, and, when the rhizomes are well pegged down and watered, very little attention besides watering will be needed for some time. A greater surface in a pan of the same dimensions may easily be obtained by raising the compost in the centre of the pan and forming a cone resting on rough pieces of peat, all made secure by being skewered together. This method is particularly

Ferns—*continued.*

suitable to certain Ferns, such as Davallias, and, with a little extra care, these mounds may easily be prevented from becoming dry.

FERNS ON CORK. Many are the ways in which virgin cork may be used, and often with the greatest advantage; but perhaps the prettiest arrangement with that material consists in the making of artificial trees of various dimensions, by firmly binding or tying pieces of cork bark together, allowing little spaces here and there to be left open, so that the hollow parts may be filled with a compost suitable to the Ferns used. Many Ferns will grow under such conditions; but Davallias, Nephrolepis, and Platyceriums particularly luxuriate under this treatment.

POROUS BOTTLES. A terra-cotta bottle, made of a specially porous material, and usually known as the "Madeira Fern bottle," having been procured, it is covered with a layer of clay about an inch thick, which is fastened to it and held in position by means of copper wire worked across in different directions. Quite tiny seedlings of *Adiantum Capillus-Veneris* are then planted in the clay, the bottle is filled with water, which soon percolates through to the clay, and hung up. There is no need to give water direct to the plants—the bottle only requires to be occasionally replenished; by that means a most pleasing ball of green foliage is produced, lasting in perfection so long as the bottle is not allowed to get dry.

FERNS FOR SPECIAL PURPOSES. The list of Ferns which follows is a selection of those best suited to special purposes, whether outdoors or inside. Those kinds which thrive best under warm treatment are distinguished by an asterisk (*); those succeeding best under ordinary greenhouse treatment have no special mark; while those which are hardy are indicated by a dagger (†).

Ferns—*continued.*

Tree Ferns. *Alsophila australis, A. contaminans*, A. Cooperii, A. excelsa, A. Rebeccæ, A. villosa*. Brainea insignis*. Cyathea arborea*, C. dealbata, C. Dregei*, C. insignis*, C. medullaris. Dicksonia antarctica, D. Barometz, D. chrysotricha, D. fibrosa, D. regalis*, D. Schiedei*, D. squarrosa. Hemitelia Smithii. Lomaria cycadoides, L. discolor, L. gibba.*

Gigantic Non-arborescent Ferns. *Acrostichum aureum*, A. cervinum, A. scandens*. Adiantum cardiochlænum*, A. tenerum*, A. trapeziforme*. Angiopteris evecta*. Aspidium capense. Asplenium longissimum*, A. Nidus*. Blechnum brasiliense. Davallia divaricata*, D. hirta cristata*, D. platyphylla. Dicksonia adiantoides, D. culcita, D. davallioides Youngii. Didymochlæna truncatula*. Marattia alata*, M. Cooperii*, M. elegans. Nephrolepis davallioides* and varieties*, *N. rufescens tripinnatifida*.*

FIG. 382. POLYPODIUM AUREUM.

Polypodium aureum (Fig. 382), *P. Heracleum*, P. sub-auriculatum*, P. verrucosum*. Pteris Drinkwaterii, P. moluccana*, P. tremula* and varieties. *Todea arborea. Woodwardia orientalis* and *radicans.*

Small-growing Ferns. *Acrostichum peltatum*. Actiniopteris radiata*. Adiantum fissum, A. Legrandii, A. Luddemannianum, A. mundulum, A. Pacottii, A. reniforme. Asplenium Ceterach†, A. elegantulum, A. flabellifolium, A. fontanum†, A. monanthemum, A. Ruta-muraria†, A. Trichomanes†, A. viviparum*. Davallia alpina*, D. parvula*. Fadyena prolifera*. Lomaria spicant* and varieties†. *Nephrodium fragrans, N. sanctum. Pellæa Brewerii, P. Bridgesii, P. gracilis. Polypodium lycopodioides, P. piloselloides, P. rupestre, P. vaccinifolium. Woodsia glabella†, W. hyperborea†, W. oregana†, W. scopulina†.*

Ferns with Coloured or Tinted Fronds. *Adiantum cardiochlæna*, A. colpodes, A. cyclosorum*, A. hispidulum, A. lunulatum*, A. macrophyllum* and varieties*, *A. peruvianum*,*

Ferns—*continued.*

*A. rhodophyllum**, *A. rubellum**, *A. tetraphyllum gracile**, *A. tinctum*, *A. Veitchianum**. *Blechnum longifolium gracile*, *B. occidentale*. *Brainea insignis**. *Davallia polyantha**, *D. retusa**, *D. tenuifolia Veitchiana**. *Didymochlæna truncatula**. *Lastrea coruscat*, *L. erythrosorat*, *L. opacat*, *L. prolificat*. *Lomaria attenuata*, *L. L'Herminieri**. *Osmunda palustris*. *Pellæa*, nearly all of a glaucous colour. *Polypodium appendiculatum*, *P. aureum*, *P. glaucophyllum*, *P. sporadocarpum*. *Pteris aspericaulis*, *P. tricolor**. *Woodwardia orientalis*.

Variegated Ferns. *Adiantum cuneatum variegatum*, *A. macrophyllum striatum**. *Anemia phyllitidis tessellata*. *Athyrium Goringianum pictum*†. *Dictyogramme japonica variegata*. *Lastrea aristata variegata*. *Polypodium vulgare variegatum*†. *Pteris aquilina variegata*†, *P. cretica albo-variegata*, *P. c. Mayii*, *P. nemoralis variegata*, *P. palmata nobilis**, *P. quadriaurita argyreia*, *P. q. tricolor**, *P. reginæ*, *P. r. cristata*, *P. Victoriæ*, *P. V. cristata*. *Scolopendrium vulgare variegatum*†.

Crested Ferns. *Adiantum cuneatum grandiceps*, *A. c. Luddemannianum*, *A. c. versaillense*, *A. excisum multifidum*. *Aspidium angulare* (numerous forms)†. *Asplenium adiantum-nigrum grandiceps*†, *A. marinum ramosum*†, *A. Trichomanes* (several forms)†. *Athyrium Filix-fœmina* (numerous forms)†. *Davallia elegans polydactyla**, *D. hirta cristata**, *D. Mariesii cristata*. *Doodia aspera multifida**. *Gymnogramme grandiceps**, *G. Parsonsii**, *G. Wettenhalliana**. *Lastrea Filix-mas* (numerous forms)†, *L. patens cristatum*, *L. Richardsii multifida*, *L. spinulosa polydactyla*†. *Lomaria spicant* (several forms)†. *Nephrolepis davallioides furcans**, *N. Duffii**. *Niphobolus lingua corymbifera*. *Osmunda japonica corymbifera*, *O. regalis cristata*†. *Polypodium vulgare* (several forms)†. *Pteris aquilina grandicepst*, *P. cretica* (several forms), *P. serrulata* (several forms), *P. tremula grandiceps*, *P. t. Smithiana*. *Scolopendrium vulgare* (numerous forms)†. *Woodwardia radicans cristata*.

Gold and Silver Ferns. *Adiantum scabrum*, *A. sulphureum*, *A. Williamsii*. *Alsophila pruinata*. *Cheilanthes argentea*, *C. Borsigiana**, *C. Clevelandii*, *C. Eatoni*, *C. farinosa*, *C. tomentosa*. *Cyathea dealbata*. *Gymnogramme calomelanos* (several silver forms)*, *G. chrysophylla* (several golden forms)*, *G. triangularis*, *G. trifoliata**. *Nothochlæna Eckloniana*, *N. flavens*, *N. hypoleuca*, *N. lanuginosa*, *N. Newberryii*, *N. nivea*, *N. sinuata*, *N. sulphurea*, *N. trichomanoides**. *Onychium auratum**.

Filmy or Transparent Ferns. *Hymenophyllum æruginosum*, *H. asplenioides*, *H. caudiculatum*, *H. chilocnse*, *H. ciliatum*, *H. crispum*, *H. cruentum*, *H. demissum*, *H. dilatatum*, *H. Forsterianum*, *H. hirsutum*, *H. javanicum*, *H. pectinatum*, *H. pulcherrimum*, *H. scabrum*, *H. tunbridgense*†, *H. Wilsonii*†. *Todea Fraseri*, *T. grandipinnula*, *T. intermedia*, *T. pellucida*, *T. superba*. *Trichomanes alatum*, *T. exsectum*, *T. humile*, *T. parvulum*, *T. pyxidiferum*, *T. radicans* and varieties†, *T. reniforme*, *T. tenerum*, *T. trichoideum*, *T. venosum*. All the above succeed under cool treatment.

Ferns of Drooping Habit. *Adiantum amabile**, *A. caudatum**, *A. concinnum**, *A. incisum**, *A. lunulatum**, *A. l. dolabriforme**. *Asplenium caudatum**, *A. flabellifolium*, *A. flaccidum*, *A. longissimum**, *A. obtusilobum**, *A. Sandersoni**. *Davallia chærophylla*, *D. dissecta*, *D. fijiensis* and varieties*, *D. hemiptera**, *D. retusa**, *D. tenuifolia Veitchiana**. *Gymnogramme gloriosa**, *G. schizophylla**. *Nephrolepis acuta*, *N. Bausei*, *N. cordifolia*, *N. davallioides**, *N. d. furcans**, *N. Duffii**, *N. exaltata*, *N. pluma*. *Polypodium appendiculatum*, *P. lachnopus*, *P. Paradiseæ*, *P. subauriculatum*, *P. sub-petiolatum*, *P. verrucosum**. *Pteris moluccana**. *Woodwardia orientalis*, *W. radicans*, *W. r. cristata*.

Ferns of Climbing Habit. *Lygodium dichotomum**, *L. japonicum*, *L. palmatum*, *L. pinnatifidum**, *L. scandens*, *L. venustum**, *L. volubile**.

Ferns of Trailing Habit. *Acrostichum acuminatum**, *A. cervinum**, *A. osmundaceum**, *A. peltatum* (*Rhipidopteris*)*, *A. scandens* (*Stenochlæna*)*. *Davallia aculeata**, *D. affinis*, *D. chærophylla*, *D. divaricata**, *D. elegans**, *D. Griffithiana**, *D. hirsuta*, *D. immersa*, *D. marginalis*, *D. Mariesii*, *D. Mooreana**, *D. novæ-zelandiæ*, *D. pentaphylla**, *D. pyxidata*, *D. repens*, *D. solida*, *D. Tyermanni*. *Dicksonia adiantoides*, *D. cicutaria*, *D. davallioides Youngii**. *Gleichenias* (all known sorts). *Hymenophyllum* (all known sorts). *Nephrolepis* (all known sorts). *Oleandra articulata**, *O. nodosa**, *O. Wallichii*. *Polypodium aureum*, *P. Billardieri*, *P. Dryopteris*†, *P. glaucophyllum**, *P. hexagonopterum*†, *P. lachnopus*, *P. lingua*, *P. l. corymbifera*, *P. Paradiseæ**, *P. Phegopteris*†, *P. piloselloides*, *P. pustulatum*, *P. repens**, *P. Schneideri**, *P. sporadocarpum**, *P. sub-auriculatum**, *P. sub-petiolatum**, *P. Swartzii**, *P. vaccinifolium**, *P. verrucosum**, *P. vulgare* and varieties†. *Polystichum capense*. *Pteris moluccana**, *P. scaberula*. *Trichomanes* (most of the known sorts). *Woodwardia angustifolia*.

Curious Ferns. *Actiniopteris radiata**, *A. r. australis**. *Adiantum reniforme*, *A. r. azarifolium**. *Anemia* (all known sorts)*. *Angiopteris evecta*. *Asplenium australasicum**, *A. Hemionitis*, *A. Nidus**. *Botrychium lunaria*†. *Ceratopteris thalictroides*)*. *Fadyena prolifera**. *Gymnogramme javanica**, *G. Muelleri*, *G. trifoliata**. *Helminthostachys zeylanica**. *Hemionitis cordata**, *H. palmata**. *Hymenodium crinitum**. *Lindsaya reniformis**. *Llavea cordifolia*. *Lygodium* (all known sorts). *Marattias* (all known sorts)*. *Pellæa geranifolia* (Fig. 383). *Platycerium* (all known sorts)*. *Polypodium fossum**, *P. Xiphias*. *Pteris ludens**, *P. palmata*, *P. sagittifolia*. *Rhipidopteris peltata**, *R. p. gracillima**. *Schizæa* (all known sorts)*. *Tænitis* (all known sorts)*. *Trichomanes reniforme*. *Vittaria* (all known sorts)*.

Viviparous and Proliferous Ferns. *Adiantum caudatum**, *A. ciliatum**, *A. dolabriforme**, *A. lunulatum**. *Asplenium alatum**, *A. attenuatum*, *A. Belangerii**, *A. bulbiferum*, *A. caudatum**, *A. Colensoi*, *A. compressum*, *A. dimorphum*, *A. flabellifolium*, *A. flaccidum*, *A. laxum pumilum*, *A. longissimum**, *A. monanthemum*, *A. obtusilobum*, *A. reclinatum**, *A. Sandersoni**, *A. tenellum*, *A. viviparum**, *A. v. nobile**. *Ceratopteris thalictroides**. *Cystopteris bulbifera*. *Fadyena prolifera*. *Gymnogramme schizophylla**. *Hemionitis cordata**, *H. palmata**. *Hypolepis Bergiana*. *Lastrea cicutæfolia*, *L. prolifica*. *Nephrolepis* (nearly all known sorts). *Phegopteris divergens*. *Platycerium alcicorne*, *P. Stemmaria**, *P. Willinckii**. *Polypodium proliferum*, *P. refractum*. *Polystichum angulare proliferum* and varieties†, *P. viviparum*. *Pteris palmata*. *Scolopendrium* (*Camptosorus*) *rhizophyllum*, *S. vulgare densum*†, *S. v. proliferum*†, *S. v. Wardii*†. *Trichomanes pinnatum**. *Woodwardia orientalis*, *W. radicans*, *W. r. Burgesiana*, *W. r. crispa*, *W. r. cristata*.

FIG. 383. PELLÆA GERANIFOLIA.

Ferns for Hanging Baskets in Warm Fernery. *Adiantum amabile*, *A. caudatum*, *A. concinnum*, *A. cuneatum grandiceps*, *A. dolabriforme*, *A. Farleyense*, *A. fragrantissimum*, *A. gracillimum*, *A. peruvianum*, *A. Williamsii*. *Asplenium caudatum*, *A. longissimum*. *Blechnum glandulosum*. *Davallia dissecta*, *D. elegans*, *D. fijiensis* and varieties, *D. Griffithiana*, *D. Mooreana*, *D. pentaphylla*, *D. tenuifolia Veitchiana*. *Gymnogrammes* (gold and silver), *G. schizophylla gloriosa*. *Microlepia hirta cristata*. *Nephrolepis davallioides furcans*, *N. exaltata*, *N. pectinata*. *Platycerium alcicorne*. *Polypodium sub-auriculatum*.

Ferns for Growing on Cork Blocks in Cool Fernery. *Adiantum Capillus-Veneris* and varieties, *A. colpodes elegans*. *Asplenium flabellifolium*. *Davallia bullata*, *D. Mariesii*, *D. M. cristata*. *Hypolepis distans*. *Pellæa rotundifolia*, *P. ternifolia*. *Platycerium alcicorne*. *Polypodium incanum*, *P. lycopodioides*, *P. pustulatum*, *P. salicifolium*, *P. tenellum*, *P. triangulare laxum*.

Ferns for Hanging Baskets in Cool Fernery. *Adiantum assimile*, *A. venustum*. *Asplenium flaccidum*. *Davallia bullata*, *D. Lawsoniana*, *D. Mariesii*, *D. M. cristata*, *D. novæ-zelandiæ*. *Hypolepis distans*, *H. tenuis*. *Leucostegia immersa*.

Ferns—*continued.*

Nephrolepis philippinensis, N. pluma, N. tuberosa. Pellæa ternifolia. Phegopteris effusa. Platycerium alcicorne. Polypodium pustulatum. Polystichum lepidocaulon. Pteris scaberula, P. serrulata and varieties. *Woodwardia orientalis, W. radicans, W. r. cristata.*

Ferns for Growing on Cork Blocks in Warm Fernery. *Adiantum ciliatum, A. dolabriforme, A. lunulatum, A. setulosum. Asplenium nobilis. Davallia decora* (all species with rhizomes). *Nephrolepis cordata compacta, N. pectinata, N. philippinensis. Oleandra nodosa. Pellæa flexuosa. Phlebodium venosum. Phymatodes vulgaris cristata. Platycerium grande, P. Hillii, P. Stemmaria, P. Willinckii, Stenochlæna scandens.*

Ferns for Planting on Walls in the Warm Fernery. *Adiantum æmulum A. amabile, A. caudatum, A. ciliatum, A. cuneatum* and varieties, *A. fragrantissimum, A. peruvianum, A. pubescens, A. tenerum. Asplenium alatum, A. flaccidum, A. planicaule. Blechnum glandulosum. Davallia decora, D. dissecta, D. elegans, D. heniptera, D. fijiensis* and varieties, *D. Mooreana, D. pentaphylla, D. Tyermannii. Leucostegia immersa. Nephrolepis* (all sorts). *Osmunda palustris. Platyloma ternifolia. Polypodium appendiculatum, Billardierii, P. Catherinæ, P. glaucophyllum, P. sub-auriculatum. Polystichum mucronatum. Stenochlæna scandens.*

Ferns for Planting on Walls in the Cool Fernery. *Adiantum æthiopicum, A. assimile, A. Capillus-Veneris* and varieties, *A. colpodes, A. cuneatum* and varieties, *A. Cunninghamii, A. denorum, A. formosum, A. fulvum, A. pubescens, A. venustum, A. Williamsii. Asplenium biforme, A. elegantulum, A. flaccidum. Blechnum occidentale. Davallia bullata, D. Mariesii, D. novæ-zelandiæ. Diplazium Thwaitesii. Doodia caudata. Hypolepis distans, H. repens. Leucostegia immersa. Nephrolepis tuberosa. Niphobolus lingua. Onychium japonicum. Polystichum triangulare laxum. Pteris adiantifolia, P. longifolia, P. scaberula, P. serrulata* and varieties.

Stove Ferns for Exhibition. *Adiantum cardiochlæna, A. Collisii, A. Farleyense, A. fragrantissimum, A. Lathomii, A. peruvianum, A. trapeziforme. Aglaomorpha Meyeniana. Anemias* (of sorts). *Asplenium Nidus. Davallia fijiensis* and varieties, *D. Mooreana, D. polyantha, D. tenuifolia Veitchii. Gymnogramme chrysophylla Alstoniæ, G. peruviana argyrophylla, G. schizophylla gloriosa. Nephrolepis davallioides, N. d. furcans, N. rufescens tripinnatifida. Microlepia hirta cristata. Platycerium grande. Polypodium Schneideri, P. sub-auriculatum. Pteris ludens.*

Greenhouse Ferns for Exhibition. *Adiantum cuneatum, A. c. grandiceps, A. gracillimum, A. Veitchii, A. Williamsii. Asplenium laxum pumilum. Brainea insignis. Davallia bullata, D. Tyermannii. Gleichenia dicarpa longipinnata, G. flabellata, G. Mendellii, G. rupestris, G. semivestita, G. speluncæ. Lomaria gibba, L. g. platyptera. Microlepia platyphylla. Phegopteris effusus. Polypodium aureum. Pteris Drinkwaterii, P. longifolia Mariesii, P. scaberula. Woodwardia orientalis, W. radicans* and varieties.

British Ferns (dwarf) for Exhibition. *Adiantum Capillus-Veneris grande, A. C.-V. imbricatum. Asplenium fontanum, A. septentrionale, A. Trichomanes confluens, A. T. cristatum, A. T. incisum. Athyrium Filix-fœmina crispum, A. F.-f. Edwardsii, A. F.-f. Vernoniæ cristatum. Blechnum Spicant cristatum, B. S. Maunderii, B. S. plumosum, B. S. trinervo coronans. Cystopteris montana. Lastrea Filix-mas fluctuosa, L. montana ramo-coronans. Polypodium vulgare cristatum, P. v. elegantissimum, P. v. Fowlerii. Polystichum Lonchitis. Scolopendrium vulgare Coolingii, S. v. cristulatum, S. v. ramo-marginatum, S. v. scalariforme.*

British Ferns (tall) for Exhibition. *Athyrium Filix-fœmina corymbiferum, A. F.-f. Craiggii, A. F.-f. Fieldiæ, A. F.-f. plumosum, A. F.-f. todioides, A. F.-f. Victoriæ. Lastrea Filix-mas Bollandiæ, L. F.-m. cristata, L. F.-m. fimbriata, L. F.-m. grandiceps, L. F.-m. ramosissima. Osmunda regalis cristata. Polypodium vulgare cambricum, P. v. pulcherrimum. Polystichum angulare cristatum, P. a. divisilobum decorum, P. a. plumosum, P. a. proliferum, P. a. p. Henleyæ, P. a. rotundatum. Scolopendrium vulgare crispum, S. v. endivæfolium, S. v. grandiceps, S. v. ramo-cristatum majus, S. v. Stablerœ.*

Hardy Exotic Ferns for Exhibition. *Adiantum pedatum. Aspidium Goldieanum. Dicksonia punctilobula. Lastrea corusca, L. erythrosora. Lomaria chilensis. Onoclea sensibilis. Osmunda cinnamomea, O. gracilis, O. interrupta. Polystichum munitum. Struthiopteris pennsylvanica.*

Hardy Ferns Suitable for Dwelling Rooms. *Asplenium biforme, A. bulbiferum, A. Colensoi, A. fœniculaceum, A. laxum pumilum, A. Nidus. Cyrtomium anomophyllum, C. falcatum, C. Fortunei. Davallia canariensis. Lastrea aristata variegata, L. atrata, L. Filix-mas cristata, L. lucida. Nephrolepis exaltata, N. tuberosa. Osmunda palustris. Polypodium aureum. Platycerium alcicorne. Polystichum capense, P. setosum. Pteris adiantifolia, P. cretica* and varieties, *P. longifolia, P. Mayii, P. Ouvrardii, P. serrulata* and varieties, *P. Todea arborea, P. tremula, P. Wimsettii.*

Hardy Ferns Suitable for Ordinary Fern-Cases. *Adiantum-Capillus Veneris* and varieties, *A. affine, A. hispidulum,*

Ferns—*continued.*

A. reniforme, A. setulosum. Asplenium alatum, A. Fernandezianum, A. fragrans, A. Hemionitis, A. inequale, A. monanthemum, A. zeylanicum. Davallia bullata, D. canariensis, D. novæ-zelandiæ, D. tenuifolia stricta. Doodia caudata. Lomaria alpina. Niphobolus lingua. Onychium japonicum. Polypodium Billardierii, P. Scoulerii, P. venosum. Polystichum setosum. Pteris cretica and varieties, *P. internata, P. serrulata* and varieties. *Scolopendrium vulgare* and varieties.

For Outdoor Ferneries. Ferns growing from 4in. to 12in. in height: *Allosorus acrostichoides, A. crispus. Aspidium nevadense. Asplenium adiantum nigrum, A. ebenum, A. Ruta-muraria, A. Trichomanes* and varieties, *A. viride. Athyrium Filix-fœmina crispum, A. F.-f. Edwardsii, A. F.-f. Findlayanum, A. F.-f. Frizellæ, A. F.-f. minimum, A. F.-f. Vernoniæ. Blechnum Spicant* and varieties. *Ceterach officinarum. Cystopteris bulbiferum, C. fragilis* and other sorts. *Lastrea Filix-mas crispa, L. rigida. Lomaria alpina, L. crenulata. Phegopteris hexagonoptera. Polypodium Dryopteris, P. Phegopteris, P. Robertianum, P. vulgare cornubiense, P. v. elegantissimum. Polystichum angulare Bayliæ, P. a. parvissimum, P. Lonchitis. Scolopendrium vulgare Coolingii, S. v. cristulatum, S. v. densum, S. v. digitatum, S. v. endivæfolium, S. v. fissum, S. v. grandiceps, S. v. marginatum tenue, S. v. ramo-cristatum, S. v. scalariforme. Woodsia ilvensis, W. obtusa. Woodwardia angustifolia.*

Ferns growing from 1ft. to 2ft. in height: *Aspidium cristatum, A. noveboracense, A. rigidum argutum. Asplenium Thelypteroides. Athyrium Filix-fœmina* (about fifteen varieties). *Dennstædtia punctilobula. Lastrea æmula, L. dilatata cristato gracile, L. d. lepidota, L. Filix-mas fluctuosa, L. F.-m. Crouchii, L. intermedia, L. marginale, L. montana, L. Thelypteris. Polypodium alpestre, P. a. flexile. P. vulgare avritum, P. v. cambricum, P. v. crenatum, P. v. semilacerum. Polystichum acrostichoides, P. aculeatum, P. angulare acutilobum, P. a. cristatum, P. a. grandidens, P. a. imbricatum, P. a. proliferum, P. a. rotundatum, P. a. Wollastonii. Scolopendrium vulgare capitatum, S. v. crispum, S. v. multifidum. Woodwardia virginica.*

Ferns growing 2ft. high and upwards: *Aspidium Clintonianum, A. spinulosum Boothii. Athyrium Filix-fœmina* (about eighteen varieties), *A. Michauxii. Lastrea dilatata* and varieties, *L. erythrosora, L. Filix-mas* (about eighteen varieties), *L. Goldieana. Lomaria chilensis. Onoclea sensibilis. Osmunda cinnamomea, O. gracilis, O. interrupta, O. regalis, O. r. cristata. Polystichum angulare* (about twelve varieties), *P. munitum. Pteris aquilina, P. a. cristata. Struthiopteris germanica, S. pennsylvanica.*

Ferns for Cutting. *Adiantum æmulum, A. amabile*, A. Capillus-Veneris, A. cuneatum, A. decorum, A. Farleyense*, A. fragrantissimum*, A. gracillimum, A. Pacotii, A. scutum*. Asplenium Adiantum-nigrum†, A. alatum. Davallia bullata, D. decora, D. dissecta*, D. d. elegans*, D. fijiensis*, D. Griffithiana*, D. tenuifolia, D. t. Veitchiana*, D. Tyermannii. Leucostegia immersa. Onychium japonicum. Osmunda palustris. Pteris cretica* and varieties, *P. serrulata* and varieties. *Polystichum angulare* and varieties†.

PESTS. To the list of destructive insect and other pests noted in Vol. II. must be added several others which do much damage alike to indoor and outdoor Ferns. One of the most destructive of all Fern pests is the Black Vine Weevil (*Otiorrhynchus sulcatus*), though seldom recorded as such. It is an omnivorous insect, and therefore especially undesirable. As a perfect insect it will feed upon the succulent young fronds, absolutely ruining the plants if the pests remain undiscovered. They are nocturnal in their habits, and in the daytime remain ensconced just beneath the soil or under rubbish of any sort, or even in wall cracks. Where young Fern fronds are attacked in the way suggested, and the depredator cannot be found in the daytime, a search should be made at night, having first taken the precaution to well surround the plants attacked with stiff paper to which some sticky substance like tar has been applied. The plants should be approached carefully, and a light suddenly turned upon them, and lightly jarred, when the Weevils, being alarmed, will drop, and remain stuck fast upon the tar. The larvæ or grubs of these Beetles are equally undesirable, as they would feed upon the roots.

Surface Caterpillars (*Agrotidæ*) are equally destructive, these again preferring the succulent young fronds. These insects have already been noticed under **Agrotis** in the present volume. Ants, too, are undesirable visitors to Ferneries, and should be secured by means of one of the traps referred to under **Ants.** Cockroaches feed upon the young fronds of Ferns in warm greenhouses, and should be trapped (*see* **Cockroaches**).

Ferns—*continued.*

Outside the insects are several other objectionable animals which at times prove troublesome to the Fern-grower—Woodlice, Slugs, and Snails, all of which should be dealt with according to the means suggested under their respective headings.

FERRARIA. To this species, &c., described on p. 9, Vol. II., the following should be added:

F. antherosa is the correct name of *F. Ferrariola.*

F. Pavonia (Pavonia). A synonym of *Tigridia Pavonia.*

F. punctata (dotted). A synonym of *F. undulata.*

F. Tigridia (Tigridia). A synonym of *Tigridia Pavonia.*

F. viridiflora (green-flowered). A synonym of *F. Ferrariola.*

F. Welwitschii (Welwitsch's). *fl.* bright yellow, in four clusters; segments 1in. long, the blade dotted with brown, longer than the broad claw; peduncles long, erect. July. *l.*, stem ones linear, the longest 3in. to 4in. long. Stem less than 1ft. long, branched below the middle. 1871.

FERREOLA. Included under **Maba** (which *see*).

FERULA. Including *Euryangium.* To the species described on pp. 9-10, Vol. II., the following should be added:

F. fœtida (fœtid). The identity of this species has been recently established as the plant which furnishes the Asafœtida of commerce. It is a native of Persia and Afghanistan. (G. & F. 1896, ii., p. 331, f. 60, 61.)

F. fœtidissima (very fœtid). A synonym of *F. Jaeschkeana.*

F. Jaeschkeana (Jaeschke's). *fl.* yellowish-white. Stem, leaves, and inflorescence as in *F. Narthex*, but the leaves are closely crenate, doubly crenate, or almost serrated. Kashmir, 1878. SYN. *F. fœtidissima* (R. G. 1878, t. 944).

F. Narthex (Narthex). *fl.* yellowish, in simple or scarcely compound umbels. July. *l.* pubescent (at least when young); lower ones 1ft. to 2ft. long, ovate; secondary and tertiary pinnæ decurrent, entire or very irregularly crenate-serrated; cauline sheaths large. Stems 5ft. to 8ft. high. Baltisthan. SYN. *Narthex Asafœtida* (B. M. 5168).

F. neapolitana (Neapolitan). A synonym of *F. glauca.*

F. Sumbul. *Euryangium Sumbul* is synonymous with this species.

FESTOONS. Shoots that are dependent in a graceful manner from climbing plants trained over the roofs of conservatories, or against walls or pillars, &c., are said to hang in Festoons.

FESTUCA. Including *Vulpia.* Four varieties of the British *F. ovina* (Sheep's Fescue) are grown in gardens, viz., *duriuscula* (rather tenacious), *glauca* (having foliage of a bluish hue), *tenuifolia* (slender-leaved), and *viridis* (green). *F. Crinum-ursi* (which is really a form of *F. varia*, a native of Central Europe and Asia Minor) is another ornamental sort, growing about 3in. high. All the above are very useful for edgings.

FEUILLÆA PEDATA. A synonym of **Telfairia pedata** (which *see*).

FEVERWORT. *See* **Triosteum.**

FEVILLEA. Flowers small, dicœious, on slender pedicels, disposed in panicles. Fruit large, zoned above the middle of the calyx-limb. Leaves petiolate, cordate, angled or palmately lobed, membranous; tendrils simple or bifid.

F. pedata (pedate-leaved). A synonym of *Telfairia pedata.*

FIBRE. The thread-like tissues that exist in plants generally; any vegetable substance the constituent parts of which may be separated into, or used to form, threads for textile fabrics or the like.

FIBRILLARIA XYLOTRICHA. *See* **Vine Fungi.**

FICUS. Including *Bosscheria, Covellia,* and *Sycomorus* (which is kept distinct in Vol. III.). The number of species, according to specimens in herbaria, is upwards of 600; they are found in the warmer regions of the globe.

Ficus elastica, though a stove subject, is very accommodating, and with a little care may be kept as a room-plant for years. Its chief requirement when so grown is to be assigned a light but draught-proof position. Its thick, leathery leaves soon accumulate quantities of dust, and this should be removed by sponging them twice a week with tepid water. Should it be necessary to repot, this should be done in April.

Ficus—*continued.*

To those described on pp. 11-12, Vol. II., the following should be added:

F. acuminata. The correct name is *F. parietalis.*

F. bengalensis (Bengal). Receptacles sessile in pairs, the size of a Cherry when ripe. *l.* petiolate, ovate to elliptic, 4in. to 8in. long, glabrescent above, glabrous or minutely pubescent beneath. India, &c. A large, stove tree. SYN. *F. indica.*

F. Cannoni (Cannon's). The correct name of *Artocarpus Cannoni.*

F. capensis. The correct name of *Sycomorus capensis.*

F. Cavroni (Cavron's). *l.* shortly petiolate, cuneate-obovate, obtuse, 1½ft. long, 9in. broad, dark green with a yellowish-white midrib above, rusty beneath. Brazil, 1887. Stove shrub.

F. comosa is a variety of *F. Benjamina.* The fruits are about ¾in. in diameter when ripe.

F. dealbata. The correct name is *Coussapoa dealbata.*

F. elastica variegata (variegated). *l.* variegated with various shades of creamy-white and yellow. A beautiful form.

F. erecta (erect). Receptacles solitary or in pairs, glabrous or hispidulous, peduncled or nearly sessile, globose or pyriform. *l.* variable in shape, entire or lobulate, or toothed. India, &c.

F. e. Sieboldii (Siebold's). Receptacles yellow and red, solitary or in pairs, ½in. in diameter, globosely pyriform, on long peduncles. Summer. *l.* 6in. to 8in. long, linear- or oblong-lanceolate, acuminate, entire or rarely slightly lobed on one side. Japan, 1878. A greenhouse bush or small tree. (B. M. 7550.)

F. indica (Indian). A synonym of *F. bengalensis.*

F. minima is a form of *F. pumila.*

F. Neumanni (Neumann's). *l.* petiolate, 1ft. or more in length, 1½in. broad, elongated-oblong, acute or almost acuminate, rounded and slightly cordate at base, three-nerved, entire; petioles 3in. to 4in. long. Branches nearly straight, obsoletely triangular. Habitat not recorded. Plant glabrous. Probably stove. SYN. *F. rigida.*

F. nobilis (noble). A synonym of *F. Porteana.*

F. nymphæifolia (Nymphæa-leaved). Receptacles axillary, twin, globular, sessile. *l.* 1ft. long, 8in. broad, rounded, deeply cordate at base, mucronate at apex, five-nerved, dark green above, whitish beneath; petioles about 8in. long. Caracas. A glabrous, arborescent species.

F. parietalis (wall-loving). The correct name of *F. acuminata* (of B. M.).

F. Porteana (Porte's). *l.* oblong, acute, with two lateral lobes, pendent, 2ft. long, 1ft. broad, dark green, glabrous. Mexico, 1862. Cool-house. SYN. *F. nobilis.*

F. pumila (dwarf). The correct name of *F. stipulata.*

F. p. variegata (variegated). A vigorous, tufted form, having the leaves margined with creamy-white. 1897.

F. radicans variegata (rooting, variegated). A garden variety, having leaves variegated with creamy-white. 1897.

F. repens is a synonym of *F. pumila.*

F. rigida (rigid). A synonym of *F. Neumanni.*

F. stipulata. The correct name is *F. pumila.*

F. Sycomorus. The correct name of *Sycomorus antiquorum.*

The following have also been introduced: *F. elegans, F. macrocarpa, F. Minahassæ* (SYN. *Bosschiana Minahassæ*), and *F. rhizocarpa* (SYN. *Covellia rhizocarpa*).

FIDONIA PINIARIA. *See* **Pinus—Insects.**

FIELDIA (of Gandichaud). A synonym of **Stauropsis** (which *see*), the correct name of *F. lissochiloides* being *S. Batemanni.*

FIGS. Below we give a selection of the best varieties up to date:

Angélique. Fruit medium, skin yellowish-green; flesh pale, and of fine sweet flavour. A free bearer, forcing well in pots.

Black Marseilles. Fruit rather small; skin deep purple; flesh reddish, very juicy, and of delicious flavour. An abundant bearer and forces well.

Bourjassotte Grise. Fruit medium to large, round, with flattened crown, pale green; skin suffused with purple; flesh red, with a thick sweet juice. One of the richest flavoured varieties, free bearer, and excellent for pot culture. SYN. *Grizzly Bourjasotte.*

Brown Ischia. Fruit small; skin pale brown; flesh also brownish, and, like all the Ischias, of a most delicious flavour. A great bearer under glass or outside.

Gourand Rouge. Fruit medium; skin reddish-brown; flesh firm, juicy, and of fine flavour. A fair cropper under glass.

Figs—*continued.*

Grosse Verte. Fruit of the largest size; skin greenish-yellow, with firm red flesh, and first-class flavour. Well adapted for pot culture.

Malta. Fruit medium, pear-shaped; skin dark; delicious flavour. A free bearer, suitable for indoor or outdoor culture.

Pingo de Mel. Fruit large; skin pale green; flesh yellowish, very juicy, of good flavour. A variety of the highest merit for early forcing in pots, and an enormous cropper, with a strong, vigorous habit. Should prove a valuable market variety.

Reculver. Fruit small; skin and flesh purplish, of sweet and good flavour. A great bearer, whether grown outside or forced.

St. John's. Fruit large; skin pale green; flesh white, firm, juicy, and of excellent flavour. A valuable new early variety, producing splendid crops in pots. This is frequently stated to be the same as Pingo de Mel, but is distinct from that variety, the fruit of St. John's being more pear-shaped.

Trifer. Fruit medium; skin yellow; flesh white, with a most delicious flavour. A great bearer, early, and suitable for forcing.

Violette Sepor. Fruit large; skin reddish-brown; flesh dark, of first-class flavour. An abundant bearer and good grower, forcing well in pots or planted out.

Yellow Ischia. Similar to the other forms of Ischia, except that the skin is a bright yellow.

PESTS. Fig trees in the open air are seldom troubled with pests. Under glass, Mealy Bug, Red Spider, and Scale are the principal foes, and all make most headway while the fruit is ripening and syringing is in abeyance. Mealy Bug and Scale may be entirely ousted by thoroughly washing every portion of the trees once or twice while dormant with a reliable insecticide, and keeping a careful look-out for any of the enemy when the plants are growing, and destroying them before they have had time to multiply. Red Spider is almost certain to attack the foliage when the fruit is ripening, owing to the comparative dryness of the atmosphere at that period; but immediately the crop is all gathered plenty of atmospheric moisture may be again maintained, and the foliage well syringed on both sides several times daily, which will soon have the effect of eradicating this pest.

Of diseases due to Fungi, the Fig is comparatively free. The most troublesome is a species of Canker, *Libertella ulcerata*, for which Mr. Massee stands sponsor. In the "Gardener's Chronicle" for July 23rd, 1898, it is fully described and illustrated. The bark of the affected trees crack, and a large area soon becomes involved. The disease, Mr. Massee suggests, usually gains access through a wound. A knife that has been used to cut out a diseased portion, if afterwards employed upon a healthy tree without fresh treating to a fungicide, will quickly set up the disease.

FIGURE-OF-EIGHT MOTH (*Diloba cæruleocephala*). Although oftener found upon Hawthorn or upon Blackthorn than upon orchard trees, yet now and again the caterpillars of this distinctive Moth inflict injury upon Apple trees and Plum trees. The perfect insect is upon the wing in September, and is common in the United Kingdom, though not frequently seen, being nocturnal. The fore-wings are fuscous, with browner spaces and orbicular whitish spots, one pair of which is confluent, forming a figure "8," and giving rise to the above popular name. The hind-wings are fuscous-whitish, with a dark blotch at the anal angle. The eggs are deposited singly or in groups, but do not hatch out until April of the following year. The caterpillars, like the perfect insect, are distinctive, being of a bluish-grey or bluish-green colour, and having a blue head, while along the back is an interrupted yellow line, and on the sides are lines of a similar colour. There are black tubercular spots, from which proceed stiffish hairs. The caterpillars are full-fed towards the end of May, by which time they are of large size. The pupa-state is passed in a cocoon in or near the food-plant.

By way of remedies nothing is better than Paris Green in the proportion often recommended, so long as it is not applied at a time likely to injure the future crop. The perfect insect will come to light freely, and if an acetylene lamp be set up anywhere near trees known to have been infested with the caterpillars in spring, numbers of the Moths may be caught and killed.

FIGWORT. *See* **Phygelius capensis.**

FILAMENT. The stalk of a stamen, supporting the anther.

FILBERT GALL. *See* **Vine Galls.**

FILLÆA. A synonym of **Erythrophlœum** (which *see*).

FINGER-AND-TOE, CLUBBING, or ANBURY. These are popular names for a disease affecting a large number of plants, but very destructive in the case of Cabbages, Turnips, Radishes, and certain Cruciferæ. The disease results from the attack of a fungus parasite known as *Plasmodiophora brassicæ*. The chief symptoms are a distortion of the roots, which finally decompose. The excrescences formed at the roots vary considerably in size, but once the plants have been attacked, decay is certain. At one time the disease was thought to be due to the irritation set up by a species of Beetle. Modern research, however, is against the Beetle theory, though it must be confessed that wherever Clubbing exists the Cabbage Gall Weevil (so-called) is frequently present in large numbers.

Alike by the Board of Agriculture and the Kew authorities the cause of "Clubbing" in Cabbage and other plants has been investigated, and the result of such investigations have been made known. On preventive rather than remedial measures must the gardener and farmer rely. The fungus is readily transferred, and carts and horses used for the conveyance of the produce from infested fields are frequently the agency for the distribution of the pest. At one time it was not safe for several years to cultivate cabbages, &c., on ground which had previously carried a diseased crop. To-day, however, by a process of sterilisation such ground may be rendered fit for their reception.

In the "Kew Bulletin" the practical treatment of these Slime Fungi resolves itself into the following: (1) In addition to cultivated plants, several common Weeds belonging to the *Cruciferæ* are attacked by the *Plasmodiophora*. Hence the necessity for preventing such weeds in fields and hedge-banks. (2) That the germs of disease are present in soil that has produced a diseased crop, and retain their vitality for at least two years. (3) That the development of *Plasmodiophora* is favoured by the presence of acids, and checked by the presence of alkalies, agreeing in this respect with the fungi rather than with bacteria. (4) For the purpose of sterilising infected soil experiments prove that either a dressing of lime or a manure containing potash salts is effective, the latter being more valuable, as it not only destroys the germs in the soil, but also arrests the disease in seedling plants, and at the same time supplies one of the ingredients necessary for the healthy growth of Turnips.

FIRE. *See* **Fuel and Furnaces.**

FIRE PINK. *See* **Silene virginica.**

FIRST OF MAY. *See* **Saxifraga granulata.**

FISCHERA (of Sprengel). A synonym of **Siebera** (which *see*).

FISCHERA (of Swartz). A synonym of **Leiophyllum** (which *see*).

FISCHERIA. *F. hispida* should be classed under *Gonolobus*.

FISH MANURE. A very good manure is made from Fish, and is sold as Fish Guano. The moisture is extracted, and the bone, &c., is then ground up into both coarse and fine guano. For top-dressing growing crops, plants in pots, &c., it is excellent. In places where Fish that is not fit for use, or is rejected by the fishermen, is dug or ploughed into the land in a raw state, it acts as a good fertiliser.

FISH POISON TREE. *See* **Piscidia.**

FISSILIA. A synonym of **Olax** (which *see*).

FISTULINA HEPATICA (Beef-Steak Fungus). *See* **Oak Fungi** (Vol. II.).

FITTONIA. *F. argyroneura* is now regarded as a good species, and not as a variety of *F. Verschaffeltii*. The plants are dwarf, but not trailing.

FITZROYA. SYNS. *Cupressellata*, *Diselma*. Catkins globose, ¼in. to ⅓in. diameter. Leaves small, ternately whorled or decussately opposite, loosely or adpressedly imbricated.

FIVE FINGERS. *See* **Syngonium auritum.**

FLABELLATE. The same as Flabelliform; resembling an open fan.

FLACOURTIA. *Sigmarota* is identical with this genus. *F. japonica* is synonymous with *Idesia polycarpa*.

FLAGELLARIA (from *flagello*, to whip or scourge; in allusion to the long, flexible shoots). ORD. *Flagellarieæ*. A small genus (two species) of stove climbers, natives of India and Fiji. *F. indica* has been introduced, but is probably no longer cultivated.

FLAGELLARIÆ. A small natural order of tall, leafy, erect or climbing plants, natives of the Old World and the Pacific. Flowers small, in terminal panicles, uni- or bi-sexual; sepals six, persistent, imbricated; stamens six, hypogynous; filaments free. Fruit a small berry, or a drupe with one to three stones. Leaves many-nerved or plaited; petioles sheathing. The order embraces three genera and seven or eight species. It is of little horticultural interest.

FLAKES. *See* **Carnation.**

FLAME-FLOWERED NASTURTIUM. *See* **Tropæolum speciosum.**

FLAME LILY. A common name for *Pyrolirion*, now included under **Zephyranthes** (which *see*).

FLAMINGO FLOWER. *See* **Anthurium Scherzerianum.**

FLAT PEA. *See* **Platylobium.**

FLAVERIA. SYN. *Vermifuga*. Most of the species are found in America, but one is Australian. Flower-heads narrow, sessile, secund, disposed in dense cymes.

FLAX LILY. *See* **Phormium.**

FLESHY. Having a firm or somewhat firm pulp, as fruit; thick but not fibrous, as leaves.

FLEURYA (name commemorative of J. F. Fleury, a writer on Orchids). ORD. *Urticaceæ*. A genus comprising eight species of stove or greenhouse annuals, clothed with stinging hairs, all tropical, a few extending to South Africa. Flowers monœcious or dicœcious, clustered; clusters in solitary, axillary cymes or spikes, unisexual or androgynous. Leaves alternate, toothed, three-nerved; stipules connate in opposite pairs or wanting. Only one species calls for mention here. For culture, *see* **Annuals.**

F. podocarpa (stalked-fruited). *fl.*, inflorescence small, unisexual; male cymes mostly in the upper axils and females in the lower. *l.* ovate, acuminate, serrated, 1in. to 2½in. long. Stem slender, erect, 1ft. to 2ft. high, simple or branched. West Africa, 1895.

FLOERKEA (of Sprengel). A synonym of **Adenophora** (which *see*).

FLORA. A name applied to the whole of the plants that grow in any particular region or locality, and to a book that describes them.

FLORAL LEAVES. *See* **Bracts.**

FLORESCENCE. Flowering; the opening of the blossoms.

FLORESTINA (origin of name not explained). ORD. *Compositæ*. A small genus (two species) of half-hardy, annual herbs, with small, whitish or purplish flower-heads, natives of Mexico, and allied to *Palafoxia*. *C. pedata* is the correct name of *Stevia pedata*.

FLORIDA RIBBON FERN. *See* **Vittaria lineata.**

FLOWER GARDEN. *See* **Garden.**

FLOWER OF A DAY. *See* **Tradescantia virginica.**

FLOWER OF THE WEST WIND. *See* **Zephyranthes.**

FLOWER OF TIGRIS. *See* **Tigridia Pavonia.**

FLOWERING BOX. *See* **Vaccinium Vitis Idæa.**

FLOWERING CURRANT. *See* **Ribes sanguineum.**

FLOWER-POTS. *See* **Pots and Potting.**

FLOWER-STAGES. *See* **Stages.**

FLUED WALLS. In former times the walls in some of the large gardens were built with flues running through them, the idea being to give more than the ordinary warmth to somewhat delicate trees, like Peaches and Nectarines, and to ensure the proper ripening of the wood and crops. Fine examples of these Flued Walls may be seen in the gardens at Snelston Hall, Derbyshire. Since cheap glass came in no more such walls have been built.

FLUELLEN. *See* **Veronica officinalis.**

FLUITANT. Floating upon or in water.

FLYWORT. *See* **Myanthus.**

FOAM FLOWER. A popular name for **Tiarella cordifolia.**

FŒTATAXUS. A synonym of **Torreya** (which *see*).

FOGGING OFF. This is better known as **Damping Off** (which *see*).

FOLIATION. The process of leafing.

FOLLICULATE. Having follicles.

FOMES IGNIARIUS (False Tinder Fungus). *See* **Polyporus** (Vol. III.).

FONTANESIA. This genus embraces a couple of species. *F. Fortunei* is a form of *F. phillyræoides*.

FOOTSTALK. This term is applied to the stalk of a flower or other organ as well as to that of a leaf.

FORBESIA. A synonym of **Curculigo** (which *see*).

FORCING. By the use of refrigerating chambers, certain plants—Lilies of the Valley for instance—may be so retarded that it is possible to produce the flowers at any season. Of plants generally employed for forcing the following may be named: *Amygdalus persica flore-pleno; Azalea amœna, A. mollis* (vars.), *A. pontica*, and Ghent varieties; *Cerasus pseudo-Cerasus; Clethra alnifolia; Deutzia gracilis, D. Lemoinei*, and *D. scabra flore-pleno; Kalmia glauca* and *K. latifolia*; Lilacs; Lilies of the Valley; *Philadelphus* Boule d'Argent; *Pieris (Andromeda) floribunda; Prunus sinensis flore-pleno* and *P. triloba; Rhododendron odoratum* and Early Gem; *Rhodora canadensis*; Roses; *Spiræa astilboides, S. confusa, S. (Astilbe) japonica*, and *S. Thunbergii; Staphylea colchica; Viburnum Opulus* and *V. plicatum; Wistaria sinensis*, and *Zenobia (Andromeda) speciosa*.

Other good plants for forcing are *Dicentra spectabilis, Polygonatum*, Carnation Winter Cheer and Malmaisons, Sweet Peas, Violets, Hellebores (Christmas Roses), Gaillardias, Pyrethrums, *Mertensia virginica rubra*, Ten Week Stock Princess Alice, and bulbs in great variety.

FOREIGN VIOLET. *See* **Schweiggeria.**

FORE-RIGHT SHOOTS. *See* **Breast-wood.**

FORRESTIA. SYN. *Amischotolype*. This genus now includes seven species of erect herbs (three of which are perhaps varieties of one). Flowers bracteate, sessile, in crowded, sub-sessile, axillary panicles; sepals and petals nearly equal; stamens six. Leaves broad; sheaths tubular, persistent after the fall of the blade. Stem simple, creeping and rooting below.

FORRESTIA (of Rafinesque). A synonym of **Ceanothus** (which *see*).

FORSYTHIA. A couple of species, natives of China and Japan (those described on p. 20, Vol. II.), compose this genus. Calyx-tube longer than the four lobes; corolla tube short, the much longer lobes spreading above; stamens two, affixed at the base of the corolla. Leaves opposite, rarely whorled.

F. Fortunei (Fortune's) and **F. Sieboldii** (Siebold's) are simply vigorous forms of *F. suspensa*.

F. intermedia (intermediate). *fl.* bright golden, large, freely produced. 1891. A garden hybrid between *F. suspensa* and *F. viridissima*. (R. G. 1891, pp. 395, 397, f. 1-4.)

FORSYTHIA (of Walter). A synonym of **Decumaria** (which *see*).

FOTHERGILLA. *F. Gardeni* is the correct name of *F. alnifolia*.

FOUNTAIN PLANT. *See* **Amarantus salicifolius.**

FOUQUIERA. Flowers showy, in thyrsoid or shorter and looser panicles; sepals five, free; petals five, hypogynous, deeply joined in a tube, spreading at apex, imbricated; stamens ten or more, in one or two series. Leaves fascicled or almost solitary in the axils of the spines (aborted leaves), small, obovate, entire, rather fleshy. To the species described on p. 20, Vol. II., the following should be added:

F. columnaris (columnar). *fl.* paniculate. Stems pyramidal, succulent, deeply wrinkled, emitting thin, straggling branches, beset with scattered, slender spines, called by Baillon abortive

Fouquiera—*continued.*

leaves, in whose axil is developed a tuft of small, fleshy leaves. Mexico. A very singular plant. (G. C. 1899, xxvi., p. 277, f. 94.)

F. spinosa (spiny). *fl.* scarlet, pedicellate, disposed in a corymbose panicle; stamens ten. *l.* mostly fascicled, obovate-oblong, membranous. *h.* 15ft. SYN. *Idria columnaria.*

FOVEATE. Having conspicuous pits or depressions.

FOVEOLARIA (of Ruiz and Pavon), in part. A synonym of **Styrax** (which *see*).

FOVEOLATE. Having small pits or depressions.

FOXTAIL PINE. *See* **Pinus Balfouriana.**

FRAGARIA. To the species and varieties described on p. 21, Vol. II., the following should be added:

F. alpina (Alpine). A synonym of *F. vesca semperflorens.*

F. chiloënsis (Chiloe). The correct name of *F. chilensis.*

F. vesca semperflorens (ever-flowering). Alpine Strawberry. *fr.* conical-ovoid, shining, in some varieties purple and white. Alps. SYN. *F. alpina.*

FRANCISIA. Included under **Darwinia** (which *see*).

FRANKENIA. About a dozen species are included in this genus. Calyx gamosepalous, tubular, persistent; petals imbricated, free; stamens four to six or more, hypogynous. Leaves opposite, small, exstipulate. To the species described on p. 23, Vol. II., the following should be added:

F. ericifolia (Erica-leaved). *fl.* red, aggregated, terminal; petals toothed. July. *l.* linear, petiolate, the margins revolute, glabrous above, beneath (as well as the stem and calyx) velvety-pruinose. Canary Islands, 1816. Hardy, evergreen trailer.

F. hirsuta (hairy). The correct name of *F. Webbii* and of *F. capitata.*

FRANKINCENSE. *See* **Pinus Tæda.**

FRANSERIA (named in honour of Dr. Ant. Franser, a Spanish botanist). ORD. *Compositæ.* A genus embracing about ten species of hardy or half-hardy, annual or perennial herbs, natives of North America, Peru, and Chili. Flower-heads small, unisexual, monœcious, nodding, sessile or shortly pedicellate, in simple, leafless spikes or racemes at the tips of the branches, or paniculate. Leaves alternate, toothed or incised, or once or more pinnately dissected. *F. artemisioides*, the only species introduced, although shrubby, should be treated as a half-hardy biennial or perennial; it thrives in sandy-loam soil, and may be propagated by seeds.

F. artemisioides (Artemisia-like). *fl.-heads* in spikes. July. *l.* bipinnatifid-dentate, greenish above, whitish-pubescent on the under-side; petioles winged. *h.* 5ft. to 6ft. Peru, 1759 and 1890.

FRASERA. Calyx having four lanceolate or linear segments; cymes irregular, forming a dense, thyrsoid or pyramidal panicle.

F. caroliniensis is the correct name of *F. Walteri.*

FRAXINUS. *F. excelsior* is the only British representative of this genus. Seedling Ash are also attacked by the Mildew referred to under **Fagus,** and should be similarly treated.

To the species and varieties described on pp. 23-4, Vol. II., the following should be added:

F. americana foliis argenteo-marginatis (silvery-margined leaved). An ornamental form, having the leaflets bordered with pale yellowish (or rosy in a young state). 1886.

F. anomala (anomalous). *fl.* in short panicles. *l.* mostly simple, thinly coriaceous, ovate, rounded, or cordate, rarely obcordate, entire or partly serrated, 1in. to 2in. long, sometimes composed of two or three sessile leaflets. North America, 1896. A shrub or low tree.

F. Bungeana (Bunge's). *fl.* many in a compound, terminal panicle. *l.*, leaflets two pairs, petiolulate, scarcely 1in. long, ovate, acute at base, acuminate at apex, bluntly serrated; petioles and petiolules minutely pubescent. *h.* 3ft. to 5ft. North China, 1894. (G. & F. 1894, vii., p. 4, f. 1.)

F. raibocarpa (bent-fruited). *fr.* sickle-shaped. *l.* few; leaflets rather small. Central Asia, 1892. A tree of graceful habit.

F. rhynchophylla (beak-leaved). A fine Ash, easily distinguished from other sorts by its winter buds, which are globose, ¼in. in diameter, having broad scales covered with thick, reddish tomentum. Northern China, &c., 1894. According to the "Index Kewensis," this is a variety of *F. xanthoxyloides.* (G. & F. 1893, vi., p. 484, f. 70.)

F. turkestanica (Turkestan). *l.* pinnate; leaflets five, dark green, cuspidate, coarsely toothed. Buds reddish. Bark dark green, smooth. Turkestan, 1887. Probably a garden form.

Fraxinus—*continued.*

F. xanthoxyloides (Xanthoxylum-like). *fl.* appearing before the leaves, in dense heads, brown from the woolly bracts. *fr.*, samaras 1½in. by 1½in. *l.*, leaflets three to five pairs, hardly acuminate, crenulate-serrate, 2in. by ¾in.; lowest petiolulate. Temperate Himalayas, &c, 1845. A shrub, or sometimes a tree 25ft. high.

FREESIA. J. G. Baker reduces this genus to one species, *F. refracta*, of which *Leichtlinii* and *odorata* are varieties.

Many failures by amateurs to grow these charming bulbs (Fig. 384, for which we are indebted to Messrs. Veitch and Sons) are recorded. The chief mistake made by most cultivators is in not giving the bulbs after flowering a good roasting in the sun. After the foliage has died down in the cold frame the pots containing the bulbs should be transferred to the sunniest place in the greenhouse for a time,

FIG. 384. FREESIA REFRACTA ALBA.

and afterwards shaken out and stored away until potting time again arrives. As well as being propagated by seeds as suggested in Vol. II., they may be increased by offsets separated at the time of storing the parent bulbs, and planted in a large pan for growing on.

F. refracta odorata (fragrant). *fl.* bright yellow, with a more equal limb than in the type, fewer in a spike; inflorescence less branched; spathe-valves broader and more obtuse. *l.* broader and less rigid. SYN. *Tritonia odorata* (L. B. C. 1820).

FREESTONE PEACHES and **NECTARINES.** These are varieties of Peaches and Nectarines in which the flesh of the fruits parts readily from the stones.

FREEZING. *See* **Frost.**

FREMONTIA VERMICULARIS. A synonym of **Sarcobatus Maximilianus** (which *see*).

FRENCH WILLOW. *See* **Salix triandra.**

FREYCINETIA. SYNS. *Jezabel* and *Victoriperria.* This and *Pandanus* are the only two genera in the Order *Pandaneæ.* To the species described on p. 26, Vol. II., the following should be added:

F. angustifolia (narrow-leaved). *fl.*, spadices three to five, ¼in. to 1in. long, racemose, on a short peduncle. *l.* Grass-like, 1ft. to 1½ft. long, finely acuminate, the margins smooth or minutely serrulated. Stems climbing, as thick as a goose-quill. Malay Islands.

F. insignis (remarkable). *fl.*, spadices two or three, pedunculate, erect; outer spathes greenish, the inner ones red. *fr.* green, 2in. to 4in. long, elongated-oblong; berries free at the conical, three- to five-cornered apex. *l.* 1½ft. to 3ft. long, ¾in. to 1in. broad, acuminate, spinulose-serrated on the margins and on the midrib beneath. Java, &c. A lofty, sparingly-branched climber.

FREYLINIA (a commemorative name). ORD. *Scrophularineæ*. A small genus (about four species) of South African, greenhouse shrubs. Flowers orange or lilac; calyx five-parted, the segments closely imbricated; corolla tube cylindrical, the lobes five, spreading, flat; stamens four, didynamous; cymes few-flowered, usually paniculate. Leaves opposite or scattered, entire, shining above. For culture of the two species described hereunder, *see* **Phygelius** (to which this genus is allied).

F. cestroides (Cestrum-like). *fl.* orange, disposed in a loosely-branched panicle 3in. to 4in. long; corolla nearly ½in. long. November. *l.* opposite, narrow-lanceolate, 3in. to 4in. long, flat, gradually narrowed at both ends. *h.* 3ft. or more. 1774. SYNS. *F. lanceolata, F. oppositifolia.*

F. lanceolata (lance-leaved). A synonym of *F. cestroides.*

F. oppositifolia (opposite-leaved). A synonym of *F. cestroides.*

F. rigida (rigid). A synonym of *F. undulata.*

F. undulata (wavy). *fl.* lilac, the same size as in *F. cestroides*; throat dotted with yellow; cymes one- to three-flowered, disposed in a simple or slightly-branched raceme 1in. to 3in. long. July and August. *l.* three to five lines long, ovate, rigid, the midrib prominent beneath. Branchlets rigid. *h.* 2½ft. 1774. SYNS. *F. rigida, Capraria undulata* (B. M. 1556).

FREZIERA includes *Lettsomia*. The species, according to Bentham and Hooker, number about eight.

FRIDERICIA (commemorative of Frederick III., King of Bavaria). ORD. *Bignoniaceæ*. A small genus (two or three species) of tall-climbing, stove shrubs, natives of Brazil, and closely allied to *Bignonia*. Flowers scarlet or yellowish-red, in an ample panicle. Leaves opposite, trifoliolate. One of the species has been introduced. For culture, *see* **Bignonia.**

F. Guilielma (William's). *fl.* seven in a compact, terminal panicle; calyx and especially the corolla often six-cleft. *l.* ovate-oblong, acute at base, shortly acuminate at apex, highly glabrous. Bahia.

FRIEDRICHSTHALIA. A synonym of **Trichodesma** (which *see*).

FRINGED VIOLET. *See* **Thysanotus.**

FRINGE LILY. *See* **Thysanotus.**

FRITILLARIA. Including *Rhinopetalum*, &c. This genus is distributed over North temperate regions.

The Fritillarias are uncommon bulbous subjects, and not well represented in gardens. Even our native Snakesheads (*F. Meleagris*) (Fig. 385, for which we are indebted to Messrs. Veitch and Sons) seldom find a place, though they are nice as to colour, and graceful to a degree.

FIG. 385. FRITILLARIA MELEAGRIS.

Fritillaria—*continued.*

To see them at their best they should be naturalised. For the rock garden *F. aurea* and *F. pudica* are two of the best. One of the kinds needing special treatment is the beautiful *F. recurva*, which succeeds in an entirely sandy soil.

To the species described on pp. 27-9, Vol. II., the following should be added:

F. armena fusco-lutea (fuscous-yellow). *fl.* bright yellow inside, tinged coppery-brown outside, solitary, drooping, ¾in. long. *l.* four to six, about 2in. long. *h.* 5in. to 6in. Smyrna, 1887.

F. aurea is a form of *F. lutea.*

F. Bornmulleri (Bornmuller's). *fl.*, perianth golden-yellow. 1896. Allied to *F. lutea* (*aurea*).

F. bucharica (Bokhara). *fl.* white, greenish or purplish at base; perianth segments ovate or ovate-lanceolate, obtusely acuminate, or rarely lanceolate or linear-lanceolate; raceme terminal, few- or many-flowered. *l.* usually all alternate, ovate or lanceolate, the upper ones narrower. Stem erect, flexuous, 6in. to 18in. high. Bokhara, 1884. (R. G. 1171.)

F. Burneti (Burnet's).* A form of *F. tubæformis.*

F. camschatcensis. The original spelling of *F. kamschatcensis.*

F. canaliculata (channelled).* *fl.* three to five to a stem; perianth purplish, campanulate. February. *l.* linear, glaucous, 3in. to 4in. long. Kurdistan, 1890. A pretty species, resembling *F. pyrenaica.*

F. citrina (Citron-coloured).* *fl.* pendulous; perianth greenish outside, yellow on the inner surface. Taurus, 1893. A very pretty species.

F. contorta (twisted). *fl.* nodding, 1½in. to 2in. long; perianth segments united (thus differing from all the other species). *l.* three or four, distant, lanceolate, somewhat fleshy. Origin unknown, 1886.

F. delphinensis. The correct name is *F. tubæformis.*

F. discolor (two-coloured). *fl.* nine to twelve, light yellow, with a slight suspicion of green, 1½in. to 2in. across; segments oblong-lanceolate, slightly reflexed; throat marked with a blood-red ring; bracts numerous. *l.* erect, sessile, sub-amplexicaul, broadly lanceolate, glaucous, fleshy, about 3in. long and 1in. broad, with a tinge of red up the midrib on the under-side. *h.* 10in. 1888.

F. Ehrharti (Ehrhart's). The correct name of *F. macrandra.*

F. gibbosa (swollen). The correct name of *F. Karelini.*

F. hericaulis (Clary-stemmed). *fl.* drooping; perianth ½in. to ¾in. long, the segments dark purple, glaucous, not tessellated. April. *l.* four, erect, alternate, sessile, the lowest oblong, obtuse, 2in. long, the others lanceolate. Stem one-headed. *h.* 4in. to 5in. Asia Minor, 1889. Allied to *F. armena.*

F. Hookeri. The correct name is *Lilium Hookeri.*

F. Imperialis. In addition to the varieties named in Vol. II., the Double Red and the Double Yellow should be named.

F. I. inodora purpurea (scentless, purple). *fl.* dark crimson. Bokhara, 1885. A handsome variety. (R. G. 1165.)

F. Karelini. The correct name is *F. gibbosa.*

F. Kotschyana (Kotschy's). A form of *F. latifolia.*

F. K. affinis (related). A synonym of *F. nobilis.*

F. latifolia (broad-leaved). *fl.*, perianth greenish-yellow, suffused with purple, more or less distinctly tessellated, the segments oblong, 1½in. to 1¾in. long. May. *l.* glaucous, oblong-lanceolate, the lower ones often 3in. to 4in. long. Stem rather thick, one-headed, about 1ft. high, with five to seven leaves above the middle. Orient, &c., 1604. (B. M. 853, 1207.)

F. l. Kotschyana (Kotschy's). *fl.*, perianth segments rather narrower. *l.*, upper ones narrow-linear. *h.* 6in. 1844.

F. liliacea (Lily-like). *fl.* drooping, on pedicels ½in. to 2in. long; perianth white, veined with green, ¾in. to 1in. long. *l.* nine to fifteen, often opposite or ternate, oblanceolate, fleshy, 2in. to 4in. long, ¼in. to ½in. broad. Stem 6in. to 12in. long, one- to six-flowered. California. SYN. *Liliorhiza lanceolata.*

F. lusitanica (Portuguese). *fl.*, perianth saturated with vinous-purple, tessellated, ¾in. to 1in. long, the segments ¼in. to ½in. broad. June. *l.* seven or eight, ascending, linear, acuminate, 3in. to 4in. long, ¼in. to ½in. broad. Stem one-headed, slender, 9in. to 15in. long. Portugal, 1825.

F. macrandra (large-anthered). The correct name is *F. Ehrharti.*

F. macrophylla. *Lilium roseum* is the correct name.

F. Moggridgei (Moggridge's). A form of *F. tubæformis.*

F. nobilis (noble). *fl.* drooping, shortly pedunculate; perianth dark claret-brown outside, within greenish-yellow spotted with brown, 1½in. long, broadly campanulate. Spring. *l.* erect; lower ones opposite, lanceolate, about 2in. long; upper ones usually three in a whorl, linear. Stem terete, erect, one-flowered, 3in. to 4in. high. Armenia, 1896. (B. M. 7500.) SYN. *F. Kotschyana affinis.*

F. oxypetala (of Hooker). A synonym of *F. Stracheyi.*

Fritillaria—*continued.*

F. oxypetala (of Royle). The correct name of *Lilium oxypetalum.*

F. Perryi (Perry's).* *fl.* approaching those of *F. recurva*, but produced in greater profusion, and appearing a fortnight earlier. 1836. A fine garden hybrid between *F. recurva* and *F. lanceolata.*

F. pluriflora (many-flowered).* *fl.* of a uniform reddish-purple, nodding; perianth segments oblanceolate, ¾in. to 1in. long; pedicels long. *l.* eight to fifteen, nearly covering the stem, somewhat whorled, narrow-lanceolate, 3in. to 4in. long. Stem stout, 1ft. or more in height, four- to twelve-flowered. Bulb of large, thick scales ½in. to 1in. long. California, 1897. (G. C. 1897, xxi., p. 231, f. 76.)

F. Raddeana (Dr. Radde's). *fl.* greenish-yellow, shorter than the pedicels. *l.*, floral ones recurved-spreading. Habit rather dwarfer than *F. Imperialis*, which the plant otherwise resembles. Central Asia, 1837.

F. Sewerzowi bicolor (two-coloured).* *fl.* light olive-green, having a brownish, V-shaped mark at the base of each segment. Alatau, 1885. A remarkable variety. (G. C. ser. iii., vol. i., p. 457; R. G. 1181.)

F. Sieheana (Siehe's).* *fl.* large; perianth segments bright green streaked with reddish-purple outside, within yellowish marked with purple. *h.* about 1½ft. Asia Minor, 1897. A splendid species, thriving in chalky soils with leaf-mould.

F. Stracheyi (Strachey's). *fl.* solitary; perianth pale purple, speckled within below the middle, the segments 1in. long, acute. June. *l.* narrow-linear, 4in. to 6in. long, ⅛in. to ¼in. broad; radical ones linear-lanceolate, long-petiolate, obtuse. Stem 6in. to 12in. high. Temperate Himalayas. SYN. *F. oxypetala*, of Hooker (B. M. 4731; L. J. F. 422).

F. tristis (sad). A synonym of *F. obliqua.*

F. tubæformis (tube-like). The correct name of *F. delphinensis.*

F. Whittallii (Whittall's). This very closely resembles *F. Meleagris*, but has an orbicular instead of a linear nectary. Taurus, 1893.

F. zagrica (native name). *fl.*, perianth of a dark lurid purple, not tessellated, glaucous on the outer surface. Kashand Mountains, Persia, 1893. Closely allied to *F. armena* and *F. tulipifolia.*

FRIVALDIA. A synonym of **Microglossa** (which *see*).

FRŒLICHIA includes *Oplotheca.*

FROG ORCHIS. *See* **Habenaria viridis.**

FROLOVIA. Included under **Saussurea** (which *see*).

FROST GRAPE. *See* **Vitis cordifolia.**

FRUIT-SPUR. A short branch having one or more fruit-buds.

FRUIT-TREE BEETLE (*Scolytus rugulosus*). Closely allied to that pest of the Elm, *Scolytus destructor*, is the insect known by the common name above adopted. Many kinds of fruit-trees are laid under contribution—Apples, Pears, Peaches, Plums, and Cherries—and the insect is even more destructive in the United States and upon some parts of the Continent than here. The trees usually attacked are either very young ones, or else those which from some cause or another lack vitality, or yet again which have suffered from external injury. The smaller branches are always affected, and the first symptoms observable are a dying away of the tips and of the foliage. This, however, is not always due to the particular insect under notice. Trees manifesting such symptoms should be further examined by the aid of a glass, and if some very minute holes are revealed it may fairly be assumed that the Fruit-Tree Beetle is the delinquent. These holes, if the bark be removed, will be found to lead to others in the wood proper. The insects are upon the wing in spring, and deposit their eggs in the bark. The larvæ, or grubs, resulting when hatched feed first upon the bark, and then tunnel the wood, though not to any great depth, always working away from the galleries made by the mother-beetle. In size the Fruit-Tree Beetle is scarcely ⅛in. long, dull black as to colour, and furrowed; the antennæ and legs are reddish. The larvæ are white and wrinkled.

Feeding as the insects do, they are not reached by insecticides ordinarily employed. The only plan available is to coat the trees with some objectionable substance, such as kerosene and soft soap made of a fairly stiff consistency, and applied to the parts very early in the year. This, however, would only be practicable when fruit was grown upon an extremely small scale. Where

Fruit-tree Beetle—*continued.*

the trees are attacked lightly, the bad portions should be cut away as early as possible in the season and burned. In the case of trees badly attacked nothing short of uprooting and burning is likely to avail.

FUCHSIA. Including *Skinnera.* Calyx-tube globose or ovoid at base, produced above the ovary into a deciduous, four-lobed, campanulate or funnel-shaped limb; petals four or very rarely wanting, convolute, spreading, or reflexed; stamens eight. Leaves opposite, alternate, or whorled, entire or toothed. To the species and varieties described on pp. 31-5, Vol. II., the following should be added:

F. ampliata (ample). *fl.* scarlet, solitary, or two or three together in axillary clusters; calyx lobes ovate-lanceolate, acuminate; petals shorter than the calyx lobes, obtusely quadrangular. June. *l.* 2in. to 3in. long, usually drooping and ternately whorled, elliptic-oblong, acute at both ends, denticulate, glabrous, sometimes pubescent beneath; petioles ¼in. to ½in. long. Stem often decumbent below. *h.* 3ft. to 5ft. Andes of Ecuador, 1877. (B. M. 6839.)

F. coccinea. In gardens this name is often applied to *F. macrostemma.*

F. conica (conical). A form of *F. macrostemma.*

F. corallina is a garden hybrid.

F. cylindracea. The correct name is *F. parviflora.*

F. discolor (two-coloured). A form of *F. macrostemma.*

F. globosa. The correct name of *F. macrostemma globosa.*

F. gracilis (slender). A form of *F. macrostemma.*

F. macrostemma (large-crowned). The correct spelling of *F. inacrostema.*

F. m. discolor (two-coloured). *fl.* scarlet and purple, small, numerous. *h.* 3ft. August. One of the hardiest of all varieties.

F. m. gracilis multiflora (many-flowered). *fl.* of a darker crimson and shorter than in the typical *gracilis*, very freely produced. *F. tenella* is a seedling form of *gracilis.*

F. parviflora (small-flowered). The correct name of *C. cylindracea.*

F. pendula (drooping). A garden hybrid with pendulous branches. 1894. (R. H. 1894, p. 470, f. 174, 175.)

F. pendulæflora is a garden hybrid.

F. pumila (dwarf). A variety of *F. macrostemma.*

F. riccartoni (Riccarton). A seedling from *F.* (*macrostemma*) *globosa.*

F. semperflorens (ever-flowering). A garden hybrid. 1888.

F. tenella (rather tender). A form of *F. macrostemma gracilis.*

F. Toddiana (Todd's). *fl.* scarlet and purple. 1843. A garden hybrid between *F. fulgens* and *F. globosa.* (R. H. ser. ii., vol. ii., p. 349.)

F. triphylla hybrida (hybrid). A garden hybrid between *F. triphylla* and *F. corymbifera.*

F. t. superba (superb). Probably a chance hybrid between *F. triphylla* and *F. corymbiflora.*

Varieties. For convenience these may be divided into classes thus:

Single-flowered. ABD-EL-KADER, scarlet, corolla plum-coloured; AMBASSADOR, crimson-scarlet, corolla dark purple; AMIE, sepals deep crimson, corolla dark purple; BLAND'S NEW STRIPED, sepals deep scarlet, corolla purple, striped red and rose; CECIL GLASS, white and pale pink; CHILWELL BEAUTY, sepals bright red, corolla rich violet-purple, free; C. N. MAY, sepals bright scarlet, corolla dark plum; COUNTESS OF ABERDEEN, pure white; COVENT GARDEN WHITE, white, purple, and crimson; CRIMSON BEDDER, sepals red, corolla purple, with foliage of a decided crimson; DEFIANCE, sepals reddish-crimson, corolla violet; DISPLAY, sepals bright red, corolla deep rose; DR. SANKEY, rich ruby red and dark glossy foliage; EMPEROR, sepals bright red, corolla purple or maroon, excellent for baskets or pillars; FAIR MAID, sepals creamy-white, corolla carmine; FILLE DE L'AIR, sepals bright red, corolla pure white, pyramidal habit; FLOCON DE NEIGE, sepals carmine, corolla pure white; GENERAL ROBERTS, crimson and purple, very fine; HARLEQUIN, sepals rich carmine, corolla bluish-purple; LYE'S EXCELSIOR, sepals white, shaded with magenta, corolla carmine; MARIE COMTE, sepals and tube red, corolla deep violet, one of the best; MONARCH, tube and sepals bright red, corolla red, shaded with violet; MR. H. ROBERTS, sepals soft rose, with a deeper shade in the corolla; PARACHUTE, sepals bright scarlet, corolla violet; P. RADAELLI, sepals red, corolla violet, striped rose; PRESIDENT, sepals vermilion, corolla deep purple; PRINCESS BEATRICE, tube and sepals pure white, corolla bright pink; ROSA BONHEUR, sepals blush-white, corolla rich rose; SALOPIA, sepals crimson, corolla light purple; SWANLEY GEM, sepals and tube scarlet, corolla rose; TOURNEFORT, sepals red, corolla white, striped red; TULIP, sepals and tube deep crimson, corolla deep purple; WHITE SOUVENIR DE CHISWICK, sepals and tube pure white, corolla rosy-pink.

Double-flowered. AUG. FLAMENG, sepals red, corolla large, purple; AUGUSTIN HARDY, sepals scarlet, corolla violet, fine;

Fuchsia—*continued.*

BALLET GIRL, tube and sepals scarlet, corolla white, one of the best; BEAUTY OF EXETER, sepals red, with darker corolla; BORE-ATTON, sepals scarlet or crimson, corolla purple; BUFFON, sepals scarlet, corolla rosy-white; CHAMPION OF THE WORLD, sepals coral-red, corolla deep purple; CHRISTOPHE COLOMB, sepals scarlet, well reflexed, corolla dark rosy-carmine, a grand variety; COMTE LEON TOLSTOI, sepals red, corolla dark blue; DOROTHY FRY, sepals crimson, corolla white, with crimson stamens, free; ELIZABETH MARSHALL, sepals scarlet, corolla white; EMILE SALLE, sepals bright red, corolla white, splendid variety; FORTUNA, sepals crimson, corolla white, marked crimson at the base; GENERAL SASSIER, sepals dark red, corolla deep violet; GUSTAVE DORÉ, sepals red and reflexed, corolla white; LA FRANCE, sepals bright red, reflexed, corolla bluish; LOUIS FAUCON, sepals scarlet, corolla purple; MADAME BRUANT, sepals bright red, corolla light rose, free; MERVEILLE, sepals coral-red, corolla dark blue; M. HERMITTE, sepals reddish-crimson, corolla blue; MRS. E. G. HILL, sepals dark red, corolla creamy-white, one of the best; PHENOMENAL, sepals red, corolla rich violet, extra large; ROSE PHENOMENAL, similar to PHENOMENAL, but with rose corolla; ROSALIE, sepals and tube crimson, corolla white; SENATEUR BERLET, sepals bright carmine, corolla rich violet, large, fine form; SERENA, sepals and tube rosy-pink, corolla rose; THALIA, sepals coral-crimson, corolla white and semi-double.

FUCHSIA (of Swartz). A synonym of **Schradera** (which *see*).

FUCHSIA, CALIFORNIAN. *See* **Zauschneria californica.**

FUCHSIA-FLOWERED GOOSEBERRY. *See* **Ribes speciosum.**

FULCHIRONIA. A synonym of **Phœnix** (which *see*).

FULLER'S HERB. *See* **Saponaria.**

FUMAGO VAGANS. *See* **Syringa Fungi.**

FUMARIA. Several species formerly classed hereunder are now referred to **Corydalis.**

FUMIGATING. In Fumigators there has been a marked advance of late years, rendering the process much easier of accomplishment, as well as more deadly to animal life. In place of Fumigators made to burn tobacco-paper or rag, the house is filled with vapour by means of a spirit-lamp fitted under a dish-like receptacle containing liquids. The vapour given off is far more deadly to insects and other animals than is tobacco-smoke, and far less injurious to tender plants or foliage, the only exception in fruit houses being in the case of Muscat of Alexandria and Lady Downes Vines. These two varieties are frequently affected by vaporising insecticides.

FUNGI. Of all pests these are the most complicated to the average gardener, as they are also the most numerous, and the most disastrous and far-reaching in their effects. As a proof of this latter, one has but to instance the Sleeping Disease of Tomatoes (*Fusarium lycopersici*), of which so much has lately been heard, both in Guernsey and in this country, where a whole season's crop may have to be sacrificed owing to the seed having been obtained from a diseased source. To many gardeners the methods by which fungoid diseases are reproduced are absolutely unknown, and such visitations as Mildew of various kinds are attributed to chance, or oftener to weather influences. Then there is a still larger section who regard such diseases as "not proven," or their injurious properties as having been exaggerated.

The gardener's chief difficulty with all Fungi is that his first acquaintance with any is usually when much mischief has been done. His first indications are when the Fungus has existed sufficiently long to produce outward characteristics—like the familiar Mildew on the Strawberry, the "Rust" on Chrysanthemum, or the Mushrooms on the roots of his orchard and landscape trees like *Agaricus melleus* (*Armillaria mellea*). Again, he does not seem able to reconcile the fact that such Fungi have forms of fruits, or spores, varying with the seasons; each has its part to play in the reproduction, or it may be in the extension of the infected area, of the species. Then there are certain small Fungi (called heterœcious) which require two plants—sometimes of widely different natural orders—to complete the cycle. The Gooseberry Rust (*Æcidium grossulariæ*), whose orange-red patches are familiar upon the foliage and fruit of that plant, is but the Cluster-Cup stage of *Puccinia Pringsheimiana*, whose other stages are found upon *Carex acuta* and *Carex Goodenovi*; while the Rust found on the leaves and other parts of Barberries is likewise a stage

Fungi—*continued.*

in the life-history of a still more destructive Fungus known as Wheat Rust (*Puccinia graminis*). These are only two familiar examples of heterœcious Fungi.

Parasitic Fungi reproduce their kind in various ways. One of the commonest, however, is by means of fruits which are equivalent to the seeds of flowering plants, though differing from them in never enclosing an embryo, or young plant. They, moreover, are of more than one kind, each, as previously stated, having a particular part to fulfil. The forms of fruits (or rather the appearance of the plants when such fruits are ripe) with which the gardener is familiar are the spring and summer ones. The winter fruit is absolutely unknown because, being a resting stage, it is passed in the soil, or it may be in the decaying parts of the plant, until the following season, when it resumes activity, and only needs to come in contact with a host-plant whose parts are favourable to its development, to commence again the cycle of life. The summer form of fruit is produced very rapidly, and as it is scattered so readily in various ways, unless the surrounding plants of the same kind are protected in some way they are sure to fall victims. Thus it is that spraying with a fungicide a house of plants from which say one unhealthy one has been removed, is of the utmost value, as it renders the susceptible parts non-susceptible. In other words, the fruit which is carried—it may be on the leaves—will not germinate, even though the conditions generally are favourable. Still, with every precaution taken, so minute are the bodies responsible for reproduction, and so difficult is it to be certain that all parts of the plant liable to infestation are covered, that some of the summer fruits are likely to find a place and go on extending the disease. A second spraying in ten days or so might therefore be adopted. When, however, plants in houses or outside have been known to be attacked one season, it will usually pay to spray early in spring, even as a precautionary measure. Many gardeners omit to do this, which accounts possibly for their failure to battle with many a fungoid disease.

A very popular notion prevails that once a plant attacked with Fungus dies, the trouble is at an end. This is, however, far from being the case, as the majority of the most troublesome diseases are tided over the resting period of the plant by the winter fruits already alluded to. For this reason the grower cannot be too particular in getting rid of every particle of rubbish—leaves, prunings, &c.—by burning, returning the ashes to the soil. This will minimise considerably the trouble from such a source; while, if it is possible to apply a dressing of lime in winter beneath trees so affected, this would further help the grower to battle with the disease.

Other means of reproducing such diseases of Parasitic Fungi are by the mycelium, or vegetative part of the plant. For this reason where trees are attacked by Fungi like *Armillaria mellea*, *Trametes pini*, &c., the practice of isolating such by means of trenches is adopted. Hartig, in his excellent work upon "The Diseases of Trees," says that if this is carefully carried out it is a certain preventive against the spread of the disease.

Another most prolific source of reproduction is found in Sclerotia, which are produced by certain Fungi affecting Potatoes, Marrows, Beans, and many bulbous plants. As the name suggests, they consist of *hard* structures, which are of variable size, colour, and form. Frequently, however, they are roundish or oval and black; they are also numerous. It is within the last few years that Sclerotia in connection with several well-known fungoid diseases have been discovered—the Lily Disease for instance. In this Prof. Marshall Ward compares them to mice-droppings, and suggests how readily they might be mistaken for "foreign bodies." Then there is an extremely troublesome Fungus popularly called the Sclerotium disease (*Sclerotinus Sclerotiorum*), which affects a host of plants, the Sclerotia being of large size. Burning those affected is all that can be done.

Sclerotia are sometimes found only in dead plants; at others only in living ones. In no case, however, do they resume activity until the host-plant itself is well advanced. Usually they rest in the soil through the winter, the hard, outer coat serving to protect the soft, inner contents of felted mycelium from frost and cold.

Mention has already been made of the desirability of collecting and burning all rubbish, such as leaves and prunings; fallen fruits should be included in the same category. Cuttings from plants infested with Fungi should

Fungi—*continued.*

never be taken, and seeds from a similar source are also to be avoided. Some varieties of vegetables and fruits have proved themselves if not exactly disease-proof, at least partially resistant, and all the principal nurserymen may be relied upon to supply them. Potatoes have been vastly improved in constitutional vigour. Unfortunately, some of our finest hardy fruits have proved less capable of resisting disease than others. Cox's Orange Pippin cankers badly despite every care in its cultivation. Another factor for the practical gardener to consider is the question of cropping. The practice of growing the same crop, or even one liable to similar diseases, year after year, on the same spot, is to be condemned, as the cultivator's trouble is only increased. Too little attention is also paid to fruit and other receptacles, and by this means it is quite possible to introduce a most troublesome disease into an area that previously boasted an immunity therefrom. (*See also* **Fungicide.**)

FUNGICIDE. A preparation which is used in order to combat certain diseases due to parasitic fungi. It is only within recent years that anything like a flood of light has been thrown upon the destructive diseases attributed to such fungi, though from Berkeley's time, at any rate, it has been known that sulphur, in some form or other, was useful as a Fungicide. Some of the more important Fungicides are here enumerated:

AMMONIACAL SOLUTION OF COPPER CARBONATE. This is one of the most useful of Fungicides, as it is clear, and besides being easy of application, it may be applied to fruit crops right up to the ripening stage, which in the case of some Fungicides—Bordeaux Mixture for instance—it would be unwise to do. Unlike Bordeaux Mixture, this solution does not disfigure the plants on which it is used. In the case of ornamental-foliaged subjects which are required for market or for decorative use in the house, this is important. A very good formula is that given by Mr. Clarence Weed, who has used it very successfully in the case of Apple Scab, Mildews, &c.:

Carbonate of Copper	4oz.
Strong Ammonia	½gal.
Water	45gals.

Mix the carbonate of copper with sufficient water to form a paste, then add to the ammonia.

BORDEAUX MIXTURE. This is probably the best of all Fungicides, and its merits have already been dealt with under the heading here adopted. What is known as the fifty-gallon formula is the safest to use upon such plants as Potatoes, Apples, Pears, Plums, and Gooseberries. In the case of tender fruits like Peaches and Nectarines it will be advisable to increase the quantity of quicklime, and add a further ten gallons of water, making sixty in all.

CONDY'S FLUID. In the case of Rusts, such as the destructive *Puccinia hieracii*, found upon Chrysanthemums, and the better known Carnation Rust, a weak solution of this has been found most beneficial.

COPPER SULPHATE SOLUTION. This is only suitable as a winter dressing for plants known to have been infested. Vines, fruit trees, and the walls of houses should be sprayed with the mixture, with a view to destroying the resting spores of certain fungi.

Copper Sulphate	1lb.
Water	25gals.

This should be prepared in a wooden vessel, and the copper sulphate be suspended in the manner suggested in the case of Bordeaux Mixture.

FLOWERS OF SULPHUR. This well-known household preparation was formerly much in vogue with rosarians against Mildew, but now it has been practically superseded by Liver of Sulphur, described below. It should be dusted on plants infested with Mildew in the early morning, when they are damp from the dews.

LIVER OF SULPHUR, or POTASSIUM SULPHIDE. This is an excellent and safe Fungicide, but to yield the best results it should be sprayed on as soon as possible after preparation.

Potassium Sulphide	1oz.
Water	3gals.

The potassium readily dissolves in a little hot water. For Mildews and certain Rusts it is of great value.

STERILISATION. This method is employed in the case of Smuts of Cereals, and consists in steeping the seed in a solution of copper sulphate.

Copper Sulphate	¼lb.
Hot Water	12gals.

Fungicide—*continued.*

The seed should be steeped in this from twelve to fourteen hours, then taken out and allowed to drain. Another plan is that known as Jensen's process, which consists in placing the seed in a suitable receptacle, and then plunging it several times in hot water. This will not injure the germinating power of the seed, but is fatal to the fungi spores. The water at the first dipping should *not exceed* a temperature of 120deg. Fahr., and at the second and subsequent dippings 132deg. Fahr. must not be exceeded. A few seconds will be sufficient for each immersion, and the water should be allowed to drain away before each plunging of the receptacle. Finally the seed should be spread out and allowed to dry. A method of sterilisation of the soil in the case of Finger-and-Toe has already been described under that heading.

Fungicides are only useful when employed in combination with the careful removing and burning of infested branches, shoots, fallen leaves, &c. To consign these to the garden rubbish-heap without resorting to burning is to increase the trouble considerably. The subject of Spraying Machines will be dealt with under that heading.

FUNIUM PILIFERUM. A synonym of **Furcræa gigantea** (which *see*).

FUNKIA. SYN. *Libertia* (of Dumortier). Including *Niobe*. Perianth funnel-shaped, with six lobes; stamens six, affixed to the tube, or hypogynous, declinate; shape simple, tall, leafless. Leaves radical, petiolate, ample.

F. alba (white). A synonym of *F. subcordata*.

F. albo-marginata (white-margined). A synonym of *F. lancifolia*.

F. cærulea (blue). A synonym of *F. ovata*.

F. cucullata (hooded). A synonym of *F. Sieboldiana*.

F. grandiflora is a form of *F. subcordata*.

F. Sieboldii. Of this species there is a variety having the leaves margined with yellow.

F. undulata (wavy). A synonym of *F. lancifolia*.

FURCRÆA. SYN. *Funium*. According to J. G. Baker, this genus comprises about seventeen species, all natives of tropical America. Flowers greenish-white, loosely paniculate, often replaced by bulbils (from which the plants may be propagated); perianth rotate, the tube short, cylindrical, the segments oblong, sub-equal, spreading horizontally; stamens short, attached to the throat of the perianth tube; filaments erect. Leaves densely rosulate, usually rigid, spiny-pointed and edged with spines. The leaves of *F. gigantea* yield an excellent fibre. To the species described on pp. 37-8, Vol. II., the following should be added:

F. albispina (white-spined). *fl.* white, tinged with green, solitary, pendulous; inner perianth segments ½in. long; panicle rhomboid, the central branches 6in. to 8in. long; peduncle 5ft. long. November. *l.* fifteen to twenty in a sessile rosette, 1ft. to 1½ft. long, 2in. broad; marginal prickles greenish-white, deltoid. Probably Central America, about 1892.

F. Lindeni (Linden's). This is a form of *F. cubensis*, differing mainly in having handsomely variegated leaves. 1869. (I. H. n. s., t. 186.)

F. pubescens (downy). *fl.*, perianth segments greenish-white, above 1in. long, ½in. to ⅔in. broad; panicle five times as long as the peduncle; peduncle rather longer than the leaves. *l.* about thirty, lanceolate, rigid, not wavy, 2ft. long, 2½in. broad, pungent, tipped and armed with distant, medium-sized spines. Tropical America, 1892. Plant stemless. (B. M. 7250.)

F. Roëzlii (Roëzl's). A synonym of *F. Bedinghausii*.

F. stricta (erect). *fl.*, perianth segments 1in. long; peduncle with panicle 8ft. to 9ft. long. *l.* about thirty in a rosette, lanceolate, bright green, 2ft. to 2½ft. long, 2in. to 2½in. broad, so deeply channelled as to be almost triquetrous above the middle, and having large, distant prickles. 1868.

F. Watsoniana (Watson's).* *l.* tufted, spreading, as long as a man's arm, 2½in. wide, convolute when young, bluish-green, with alternate bands of creamy variegation; margins undulated, with minute spines at distant intervals. 1898. A beautiful plant. (G. C. 1898, i., pp. 242-3, f. 90.)

FUSARIUM LYCOPERSICI. *See* **Sleeping Disease of Tomatoes.**

FUSCESCENT. Slightly fuscous.

FUSCOUS. Greyish-brown.

FUSICLADIUM DENDRITICUM and **F. PYRINUM.** *See* **Apple and Pear Scab** in present volume.

FUSSIA. A synonym of **Aira** (which *see*).

FUSTIC-TREE. *See* **Chlorophora tinctoria.**

GABERTIA. A synonym of **Grammatophyllum** (which *see*).

GÆRTNERA. The two species described under this heading belong to **Hiptage** (which *see*).

GAGEA. SYN. *Ornithoxanthum.* To the species described on p. 39, Vol. II., the following should be added:

G. arvensis (field-loving). A synonym of *G. stellaris.*

G. lutea. The correct name is *G. fascicularis.*

G. stellaris (star-like). *fl.* yellow, disposed in a corymbiform raceme; perianth segments lanceolate. March and April. *l.*, radical ones two, linear, obtuse, channelled and recurved; floral ones opposite, lanceolate. Europe. SYN. *G. arvensis.*

G. stenopetala. The correct name is *G. bracteolaris.*

GAHNIA (called after H. Gahn, a Swedish botanist of the eighteenth century). SYN. *Psittaroschœnus.* ORD. *Cyperaceæ.* A genus embracing about a score species of stove or greenhouse, perennial herbs, mostly Australian, a few inhabiting New Zealand, New Caledonia, the Malayan Archipelago, South China, and the South Pacific Islands. Spikelets blackish or brown, often two-flowered; glumes many; hypogynous bristles none; stamens three to six; panicle ample and loose or narrow and spike-like. Nut reddish-fuscous, whitish, or black, ovoid, obovoid, or sub-fusiform. Leaves usually long, terete, with a long, subulate acumen. It is doubtful whether the plant here described is the true *G. aspera.* For culture, *see* **Cyperus.**

G. aspera (rough). *fl.*, spikelets whitish-yellow; inflorescence terminal. *fr.* reddish-yellow. *l.* bright green, channelled, wavy, lanceolate. Fiji, 1887. An ornamental plant, of Arundo-like habit.

GAILLARDIA. SYNS. *Calonnea, Galardia, Virgilia.* About eight species are comprised in this genus.

This is another of the flowers which the florist has taken in hand with excellent results, and the perennial Blanket Flowers (Fig. 386), as they are sometimes called, are amongst the most valuable flowers from early summer till late autumn. They are very effective when planted in bold groups in the border; while even as bedding plants they have few superiors when pegged down 1ft. or so apart. In hot, dry summers they are amongst the comparatively few subjects which are not injuriously affected. They have few enemies, and may be readily preserved for years if covered with some light litter before severe weather sets in. For supplying cut-flower material, they are also valuable. A deeply-worked but light and rich soil suits them best, and they should be planted in spring. There are both single and double varieties, the former being the more decorative, but the latter prove the more useful for cutting.

FIG. 386. FLORISTS' GAILLARDIAS.

Gaillardia—*continued.*

Varieties. These are numerous, but mostly some shade of crimson, red, or yellow. Some good ones are:

ADDISON, BASSANIO, CHARLES KINGSLEY, ELLEN TERRY, GENERAL SYMONS, HYPATIA, JAMES KELWAY, LADAS, LANGPORT WONDER, LORD METHUEN, LORD ROSEBERY, MR. PITCHER, OLIVER WENDELL HOLMES, PRIMROSE DAME, RUBINSTEIN, ST. BLAISE, SPLENDIDISSIMA PLENA, VIVIAN GREY, W. B. CHILD, WILLIAM KELWAY, and WILLIAM ROLFE.

GALACTIA (from *gala*, milk; in allusion to the milky juice of some of the species). Including *Collæa* and *Sweetia* (of De Candolle). ORD. *Leguminosæ.* A genus embracing about forty-five species of stove, greenhouse, or hardy, prostrate or twining herbs or erect shrubs, all American, allied to *Camptosema.* Several of them have been introduced, but they are probably no longer grown.

GALACTITES. SYN. *Lupsia.* *G. australis* has been introduced, but is probably lost to cultivation.

GALANGA. A synonym of **Alpinia** (which *see*).

GALANGALE. *See* **Kæmpferia Galanga.**

GALANTHUS. This genus consists of about half-a-dozen species, confined to Europe and Western Asia. Flower generally solitary, cernuous; spathe usually simple; perianth tube none, the outer segments oblong-spathulate, the inner ones much shorter, obovate, emarginate, stiffly erect; stamens epigynous; filaments very short. Leaves two or three, lorate. Rootstock a tunicated bulb, one tunic wrapped tightly round the base of the stem and leaves. A number of plants that have been described as species are now regarded as mere forms of *G. nivalis.*

Snowdrops are amongst the most appreciated of hardy bulbs, though it is the spring- rather than the late-flowering kinds, like *G. nivalis octobrensis,* which are known. They may be employed in a variety of ways—in the border, on the rockery, in the beds, and in the grass. The last is the most natural method of all, and when grown thus the refined beauty of the flowers is seen to the greatest advantage. The bulbs should be planted in autumn, and 2in. deep, and unless there is some good reason for it they should not be disturbed very frequently. Propagation may be effected by seeds sown as soon as procurable in light, sandy soil, in boxes; or they may be divided just after flowering and immediately replanted. The autumnal kinds, like the one above-named, *Rachelæ, Olgæ, corcyrensis, cilicicus,* and Cassala, are not as vigorous as their spring relatives, but nevertheless are well worth attention by the cultivator of hardy bulbs.

Sparrows prove troublesome in almost all gardens; but they may be prevented from doing much damage if black thread be stretched across the beds or borders. The greatest enemy of the Snowdrop cultivator is, however, a species of Mildew due to *Sclerotinia galanthina,* which causes the plants to rot away very suddenly and mysteriously, as the foliage shows no sign as a rule of weakness. If, however, disease be suspected, the foliage and bulbs had better be examined, when probably a greyish mould will be discovered upon the former. Later in spring both foliage and bulbs will be found to be covered with the black bodies known as sclerotia. When this is the case, such bulbs should be burned, and fresh positions given them. Whenever bulbs suddenly cease to flower without any apparent cause, the disease should be suspected, and measures be taken to prevent it from spreading. It would also be advisable to lift any bulbs in the vicinity and well dust them with powdered sulphur, replanting them in fresh quarters.

A species of *Rhizoglyphus,* popularly known as Bulb Mite, also proves troublesome to Snowdrops, and badly-affected bulbs should be destroyed, as the Mites are with

Galanthus—*continued.*

difficulty reached, feeding as they do in the folds of the bulbs.

To the species, &c., described on p. 41, Vol. II., the following should be added:

G. Alleni (Allen's). A synonym of *G. nivalis caucasicus.*

G. byzantinus (Byzantine). *fl.*, outer perianth segments ¾in. long; inner ones marked with green as in *G. plicatus*; scape slender, 6in. long. February. *l.* shorter than the scape when flowering, glaucous, broadly channelled as in *G. Elwesii.* Bulb medium-sized, globose. Habitat not recorded, 1893.

G. cilicicus (Cilician).* This is closely allied to *G. Fosteri*, but differs in its less robust habit, much narrower leaves, and in the absence of the large green blotch on the lower half of the inner perianth segments, while the green glaucous line found upon the centre of the leaves of Snowdrops generally is absent. Cilician Taurus, 1897.

G. Elwesii Cassala* has larger flowers than the type, with a blotch on the three inner perianth segments, the basal one being conjoined.

G. E. globosus (globular) *fl.* frequently two; perianth limb globose; outer segments very broad. 1887. (Gn. 1887, i., p. 393, under name of *G. globosus.*)

G. E. robustus (robust). A very robust variety, with a large bulb, and thick, glaucous leaves. Asia Minor, 1893.

G. E. unguicularis (clawed). A variety of erect habit, and easily distinguished from the type by its claw-like segments. Asia Minor, 1894.

G. E. Whittallii (Whittall's).* A distinct early-flowering variety, with large blossoms. 1893.

G. Fosteri (Foster's).* *fl.* white; outer segments convex on the back, 1in. to 1½in. long; inner ones obovate-cuneate, with a large green blotch on the lower half; spathe-valve green, linear-convolute, 2in. long; peduncle slender, shorter than the leaves. February. *l.* bright green, 6in. long, 1in. broad. Asia Minor, 1889.

G. globosus (globular). A form of *G. Elwesii.*

G. gracilis (slender). *fl.* having a large green blotch at the base of the inner perianth segments, the outer ones ¾in. long; scape overtopping the leaves. March. *l.* glaucous, the edges not reflexed. Bulb small, globose. Bulgaria, 1893. Allied to *G. Elwesii.*

G. grandiflorus (large-flowered).* *fl.* resembling those of the large forms of *G. nivalis.* *l.* having a recurved edge, very glaucous beneath. Bulb very large, globose. Habit very robust. Origin uncertain; perhaps a hybrid. 1893. SYN. *G. maximus.*

G. Ikariæ (Icarian). *fl.*, inner perianth segments quadrate, with crisped edges as in *G. Elwesii*, and the single apical blotch as in *G. nivalis*; scape 7in. to 8in. long. *l.* bright green, lorate, ½in. to ¾in. broad, the margins not recurved. Nikaria (the classical Icaria), 1893.

G. latifolius (broad-leaved). *fl.*, outer segments oblong-spathulate, ½in. to ¾in. long; inner ones with only a green patch round the sinus; anthers narrowed suddenly to an acute point. February and March. *l.* ¾in. to 1in. broad, simply channelled down the centre. Bulb 1in. in diameter. Caucasus, 1868. (G. C. 1879, f. 32c, 1891, p. 404, f. 80; R. G. 1868, t. 578, f. 1.)

G. maximus (largest). A synonym of *G. grandiflorus.*

G. Nicana (Nikarian). A late-flowering Snowdrop, with broad, short foliage; probably identical with *G. Ikariæ.* 1897.

G. nivalis Atkinsi (Atkins's). A large-flowered garden variety. 1891.

G. n. caucasicus (Caucasian). *fl.*, outer segments pure white, broader, more convex on the back, and with a narrower claw, than in the genuine *G. nivalis*, ½in. to 1in. long, the inner ones obovate-cuneate, with a deep notch and two erect, rounded lobes, only marked green outside in a horse-shoe patch round the notch, but within streaked with green and white more than half-way down. SYN. *G. Alleni.* The garden varieties *latifolius* (=*Redoutei*) and *virescens* belong to this sub-species.

G. n. corcyrensis (Corfu). A small variety.

G. n. c. præcox (early). This is an early-flowering form, with broader leaves.

G. n. Elsæ (Elsa's). This variety is nearly allied to *G. n. corcyrensis*, but has larger flowers and stouter leaves. November to March. Mount Athos, Macedonia, 1891.

G. n. lutescens (yellowish). *fl.* having the inner segments tipped with yellow instead of green, and a yellowish ovary.

G. n. poculiformis (cup-shaped). *fl.* having the inner segments plain white and nearly as long as the outer ones.

G. n. Rachelæ (Rachel's).* This resembles *Elsæ*, but is more robust and has larger flowers. October and November. Mount Hymettus, 1891.

G. n. Scharloki (Scharlok's). This form has two long, herbaceous spathe-valves, sometimes two flowers, and a green spot at the tip of each outer segment. 1888. The name is sometimes mis-spelt *Sharlocki* and *Shaylockii.*

Galanthus—*continued.*

G. n. serotinus (late). An autumn-flowering variety. 1883. Other varieties of *G. nivalis* are: *Melvillei*, almost identical with *Imperati*; and *octobrensis*, flowering in October.

G. Olgæ (Queen Olga's). *fl.*, outer segments oblong-unguiculate, about 1in. long, ½in. to ¾in. broad; inner ones half as long, plain white, with rounded lobes. October. *l.* 6in. to 8in. long, ½in. broad, simply channelled, glaucous, especially beneath. Greece, 1883.

G. Perryi (Perry's). *fl.*, outer perianth segments ½in. to ¾in. long, the inner ones deeply emarginate, with a green, horse-shoe mark at the apical sinus; scape 5in. to 6in. long. *l.* 2in. long, ½in. broad. Bulb 1in. in diameter. 1893. Intermediate between *G. caucasicus* and *G. latifolius.*

G. umbricus (Umbrian). A synonym of *G. nivalis Imperati.*

GALAPEE-TREE. *See* **Sciadophyllum Brownii.**

GALARDIA. A synonym of **Gaillardia** (which *see*).

GALATEA. A synonym of **Eleutherine** (which *see*).

GALAXIA. Of this genus there are but two species—those described on p. 41, Vol. II. Stamens inserted at the throat of the perianth tube, the filaments connate in a cylindrical column.

G. ovata grandiflora (large-flowered). *fl.* 1½in. in diameter when fully expanded (in the type they are only 1in. across). (A. B. R. 164 and B. M. 1203, under name of *G. grandiflora.*)

GALEA. A helmet or hood; a helmet-shaped sepal or petal; hence Galeate, helmet-shaped.

GALEANDRA. SYN. *Corydandra.* To the species and varieties described on pp. 41-2, Vol. II., the following should be added:

FIG. 387. GALEANDRA BAUERI.

G. Baueri (Bauer's). *fl.* brownish-green, in drooping racemes; lip with purple front portion, and white outside. June to August. *l.* lance-shaped, three-nerved. South Mexico, &c. See Fig. 387. (Bot. Reg. 1840, t. 49.)

G. Baueri (of Lindley). A synonym of *G. Batemanni.*

G. Claesii (Claes'). *fl.* about 2in. across, six to eight in a drooping raceme about 9in. long; sepals and petals brown; lip rosy. *l.* bluish-green. Pseudo-bulbs slender, about 1ft. long. Brazil, 1893. Allied to *G. villosa.* (L., t. 391.)

G. d'Escagnolleana (Baron d'Escagnolle's). *fl.*, sepals and petals brownish-ochre; lip white and sulphur, the median lobe marked with dark purple; spur funnel-shaped. *l.* narrow-lanceolate, acuminate. Para, 1887. Allied to *G. Baueri lutea.* (I. H. ser. v., t. 22.)

G. Devoniana Delphina. *fl.*, sepals and petals reddish-brown, margined yellowish, lanceolate, acute; lip white, veined purple, large. Venezuela, 1887. A distinct variety, slenderer in all its parts than the type. (L., t. 80.)

G. flaveola (yellowish). *fl.*, sepals and petals yellowish, tinted sepia, lanceolate, acuminate; lip yellow, dotted hyaline-purple; apiculus of the anther having a black, anchor-like, terminal

Galeandra—*continued.*

process; raceme eight-flowered. *l.* cuneate, linear, acuminate, ¼in. broad, the uppermost ones smaller. Stem more than 9in. long. Venezuela, 1887.

G. lagoensis (Lagoa). This is described as "a very singular species, with greenish sepals and a large, crimson lip." Brazil, 1894.

GALEDUPA. A synonym of **Pongamia** (which *see*).

GALEGA. To the species, &c., described on p. 42, Vol. II., the following should be added. Several plants that were formerly included hereunder are now referred to **Tephrosia.**

G. biloba (two-lobed). A form of *G. officinalis*, with pretty, bluish-lilac flowers.

G. officinalis africana (African). *fl.* purplish; racemes longer than in the type. *l.* broader and more obtuse.

G. o. alba (white).* A pretty variety bearing pure white flowers and growing 3½ft. to 4ft.

G. o. bicolor (two-coloured). A garden variety with blue and white flowers.

G. o. compacta (compact).* The flowers of this variety are of a delicate lilac. 3ft.

G. tricolor (three-coloured). A synonym of *G. officinalis.* (H. E. F., t. 185.)

GALEOLA. SYNS. *Cyrtosia, Hæmatorchis, Ledgeria, Pogochilus.* Flowers mediocre or rather large; lip sessile at the base of the column, broad, concave.

GALINSOGEA. Included under **Tridax** (which *see*).

GALIPEA. *G. trifoliata* furnishes the Angostura-bark of commerce. *G. heterophylla, G. macrophylla,* and *G. odoratissima* are now classed under **Cusparia.**

GALL MIDGES. *See* **Cecidomyia.**

GALTONIA. This genus now embraces three species. Flowers white, showy, in a long, loose raceme; perianth tube rather broad, rounded at base, the lobes as long as the tube, spreading; stamens six, affixed to the throat or tube, shorter than the lobes; scape simple, leafless. Leaves few, radical.

G. candicans will not thrive outside, except the position be a sunny one and the soil light, rich, and well drained. In such favoured spots, however, it makes a splendid show, and associated with early Gladioli a nice effect is created. In Guernsey the plants are seen to perfection. They may be planted in either autumn or spring, the latter for preference, and the bulbs should be buried some 6in. or 7in. Once planted, they should not be frequently interfered with, as they resent such treatment. Potted up for the conservatory or for the greenhouse they are excellent, and may be had in flower either early or late in the year. Bulbs so treated should, however, be returned to the borders. Seeds should be sown in March.

To the species described on p. 43, Vol. II., the following should be added:

G. clavata (club-shaped). *fl.* scentless, arranged in a lax raceme; perianth tube clavate, about 1in. long, the segments ¼in. long, oblong, obtuse; peduncle 2ft. high. Autumn. *l.* six or eight, sessile, lanceolate, glabrous, glaucous-green, 2ft. long. 1879. An unattractive plant. (B. M. 6835.)

G. princeps-candicans (hybrid). A garden hybrid between the two species indicated in the name. 1899.

GALVANIA. A synonym of **Palicourea** (which *see*).

GAMMA MOTH, or **SILVER Y MOTH.** *See* **Plusia.**

GAMOLEPIS (from *gameo*, to marry or unite, and *lepis*, a scale; in allusion to the connate involucral scales). ORD. *Compositæ.* A genus embracing about a dozen species of greenhouse or half-hardy shrubs or rarely herbs, natives of South Africa, only differing from *Euryops* in having no pappus. *G. annua* requires the ordinary treatment of half-hardy annuals. For culture of the other species in cultivation, *see* **Othonna.**

G. annua (annual).* *fl.-heads* bright yellow or orange; involucral bracts ten to fifteen. *l.* 1in. to 1½in. long, pinnati-partite; lobes five to seven on each side, ⅛in. to ⅜in. long, linear, entire or with one or two lobules. Branches flexuous. *h.* 3in. to 10in. A slender, wiry, glabrous, mostly branching annual. SYN. *G. Tagetes.*

G. euryopoides (Euryops-like). *fl.-heads* yellow, borne on peduncles 2in. to 4in. long. *l.* crowded, 1in. to 1½in. long, mostly trifid to the middle (some entire); lobes about ¼in. long, linear, concave, thickish, sub-acute. *h.* 2ft. 1863. An erect, leafy bush, with the aspect of *Euryops abrotanifolia.* (B. M. 6249.)

G. Tagetes (Tagetes). A synonym of *G. annua.*

GAMOPETALOUS. The same as Monopetalous. Having the petals more or less joined, so as to form a tube or cup.

GAMOPLEXIS. A synonym of **Gastrodia** (which *see*).

GANYMEDES. Included under **Narcissus** (which *see*).

GARCINIA. SYN. *Brindonia.* Of the three dozen species embraced in this genus, seven are tropical African, and the remainder are found in tropical Asia and Polynesia. Flowers polygamous; sepals and petals four or five each, the former decussate, the latter imbricated. To the species described on p. 43, Vol. II., the following should be added:

G. Hanburyi (Hanbury's). *fl.*, males axillary, solitary or in groups of three to six, on pedicels ¼in. to ½in. long; females solitary, axillary, much larger than the males. *fr.* spherical, larger than that of *G. Morella. l.* more ovate in form and sometimes 7in. long and 4in. wide. *h.* 30ft. to 60ft. Cochin-China, &c. This is one of the species producing gamboge.

G. ovalifolia (oval-leaved). A synonym of *Xanthochymus ovalifolius.*

G. Xanthochymus. A synonym of *Xanthochymus pictorius.*

GARDEN. By far the larger number of Gardens met with are those attached to villas, and usually the space at command is not well utilised. It has now become a recognised thing to set apart the ground found behind most dwelling-houses entirely for the cultivation of flowers, as vegetables may now be obtained so cheaply that in small quantities they are not worth growing.

The designs given may readily be followed by the amateur, without the aid of costly tools or the experience of a skilled workman. To take the simplest form (Fig. 388): Set out the border about 3ft. wide along one side of the Garden, and line it up with edge-tiles, bricks, or even a boarded edge; from this line measure 2ft. 6in. for the gravel path, and at several intervals place some small stakes. Now pass a line of string along these stakes, which will form the boundary of the lawn. Next set out the centre flower-bed, which is arranged after the shape of a Maltese cross. To do this, drive some small stakes at the four extreme corners, as shown by the black dots (Fig. 388). Then measure and stake out the inside square, and place stakes (as illustrated by the black dots) for the corners of the figures. Now if some twine is passed from stake to stake (as shown by the dotted lines), the outline of the figure is at once obtained.

Information on the making of Lawns will be found under that heading in Vol. II., as well as a little later on in the present volume.

A summer arbour may be fixed in one corner, which should be the shadiest of the four corners. Fig. 389 is a cross-section of the ground showing the level of the path, lawn, and flower-bed.

Fig. 390 illustrates a design where the central bed is a diamond shape, surrounded with a grass lawn, which is edged with a rockery-work border 3ft. wide. This is a very suitable place for the cultivation of Ferns, &c. At the end of the lawn, a space about 6ft. or 8ft. wide may be left for division between a summer arbour and a greenhouse. Fig. 391 shows the relative heights of rockery, lawn, and flower-bed, the setting out of which may be done by arranging string-lines on stakes, to represent the dotted lines shown in Fig. 390.

Fig. 392 is a simple design, formed with a centre bed supported by two crescent-shaped beds, which are surrounded with a lawn and edged with a border 3ft. wide. In this case the principal part of the work is to lay the lawn and set out the beds, as there is no high elevation of the border. The beds are struck out by placing a stake at A (Fig. 392), and with a length of string equal to the radius of the circle required, and a sharp-pointed stick tied in, mark out the circle in the soil. The centres for striking out the crescents are given in the illustrations, the work being performed as above. A summer arbour occupies the central position at the end of the Garden. Fig. 393 shows the relative heights.

In Fig. 394 a design is introduced in which more ground is devoted to the flowers and less to the lawn. The border is 3ft. wide, edged with tile, wood, or bricks; the main

Garden—*continued.*

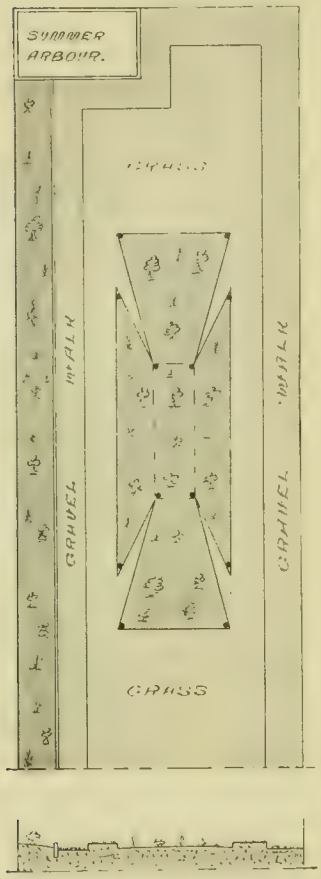
path is 2ft. 6in. wide, and gravelled. The dimensions of the beds must be arranged according to the space at disposal, but roughly the Garden should be divided into about three equal lengths. The method of striking out the beds may be seen in Fig. 394, where the centres for the various circles are shown by black dots. An improvised wooden trammel, with a shifting point, is useful for setting out. At one end of the Garden a greenhouse and summer arbour are arranged. Fig. 395 illustrates the relative heights.

Fig. 396 illustrates a very stylish design—easily constructed, and not expensive to stock. The centre bed is about 10ft. in diameter, cut in the lawn; the side borders are 2ft. 6in. wide; and at each corner of the lawn are

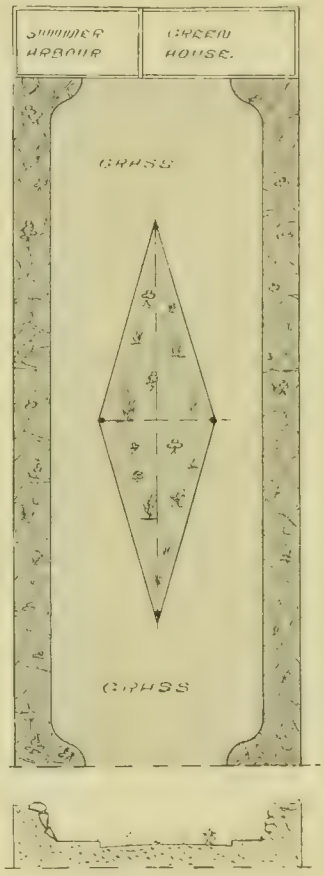
Garden—*continued.*

covering of 6in. or so of soil answer well for plants, and afford good drainage. The face may be made of about every conceivable kind of material, such as broken pipes, engine-clinkers, pieces of rough stone, brick-clinker, brick-ends, limestone, large pebbles, spar, &c.; and the larger the variety the better the appearance obtained. Butt ends of trees, dug after the trunk is felled, can always be introduced with advantage, as, for instance, in place of the pedestal vases.

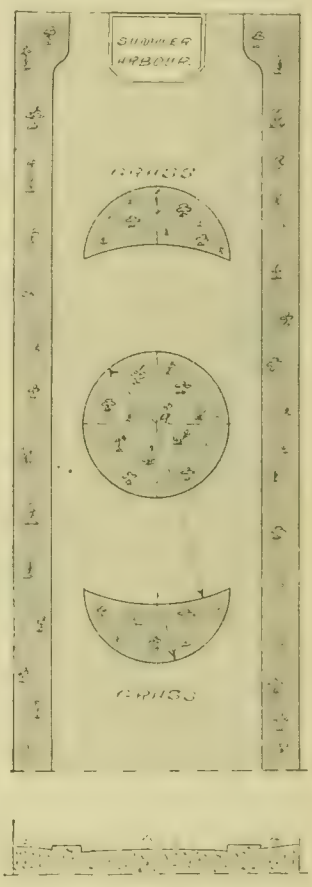
In all of the accompanying designs it is possible to fix a straight line for drying clothes the entire length of the Garden, without coming in contact with the various flower-beds, &c., a point which will no doubt greatly recommend itself where the laundry work is performed at home.



FIGS. 388 AND 389.
DESIGN FOR SMALL GARDEN.



FIGS. 390 AND 391.
DESIGN FOR SMALL GARDEN.



FIGS. 392 AND 393.
DESIGN FOR SMALL GARDEN.

placed pedestal flower-vases (Fig. 400). The central position at the end of the Garden is occupied by a rustic summer-house. Fig. 397 illustrates the relative heights.

Fig. 398 contains a large proportion of rockery, and is most suitable for those who prefer a rugged to a more formal appearance in their Gardens. The side rockery is 3ft. wide, whilst the two circular rockeries are about 10ft. in diameter and 4ft. high at the apex. At each corner of the lawn a pedestal vase (Fig. 400) may be placed, filled with Pelargoniums, &c., and a number of creepers to come down the sides. A summer arbour or greenhouse may be placed at the end. Fig. 399 shows the relative heights.

In making the rockery-work, cinder-ashes, brick-rubbish, &c., are always available for the bottom, and with a

In each of the illustrations the dwelling-house is presumed to be at the lower end of the drawing, where the thick dotted line crosses.

When the villa is semi-detached, the rule is for a strip of land to run back from the house a certain distance. This strip, termed a Garden, is often the same width as the house, and enclosed by a wall on each side, which separates it from Gardens of similar size belonging to neighbours. Fig. 401 illustrates a Garden of this description, which must be laid out on somewhat simple lines, as space will not permit of anything elaborate, nor would any elaborate style appear to advantage in such a small area. However, before any planting is done, the drainage ought to be made good if at all defective, and the soil of the beds and borders rendered suitable for the reception of the plants. If the soil be of a heavy character, road sweepings

Garden—*continued.*

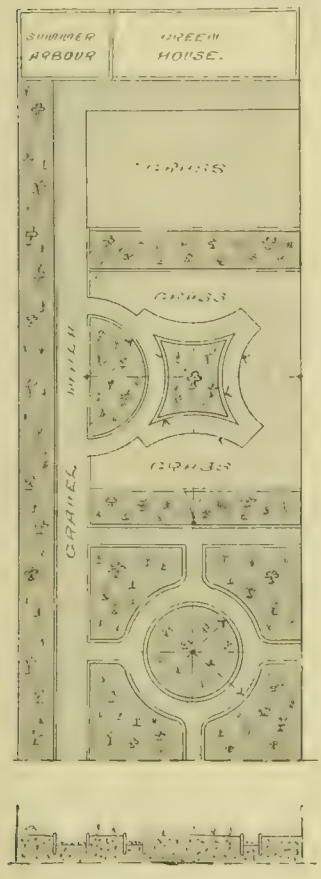
or scrapings, fine ashes, or any good material that will assist in making the soil more porous, will be very beneficial. Again, if the soil be poor and hungry, a liberal application of manure, dug or trenched deeply in, will be necessary: otherwise the plants would languish.

Having prepared the soil, the walks should be made. This consists in excavating the soil from 8in. to 10in. deep, and the requisite width, then filling in to a depth of about 6in. with broken bricks, clinkers, or rough stones. Over this there should be laid 2in. or 3in. of rough gravel, and on that, again, an inch of fine or sifted gravel, making all firm, and placing it so that the walk, when complete, is highest or rounded in the centre, and gently sloping to the sides. Such a walk is dry both summer and winter, and

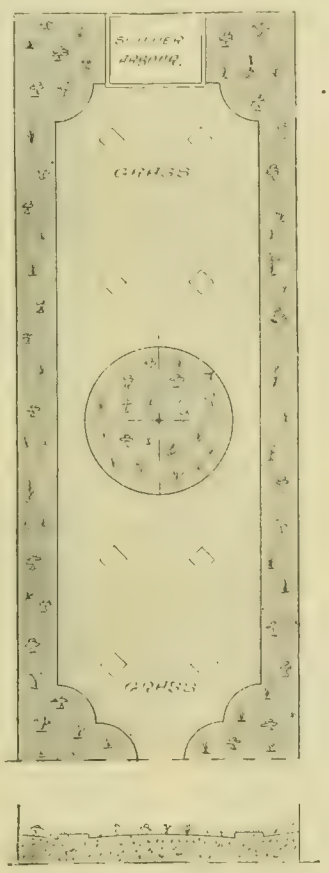
Garden—*continued.*

a good sward is most quickly obtained if sown in the spring. As the young sward grows, it should be kept mown and well rolled. All Daisies and Dandelions should be drawn out immediately they are observed. In fact, any very coarse-growing plant that may appear is best removed at once.

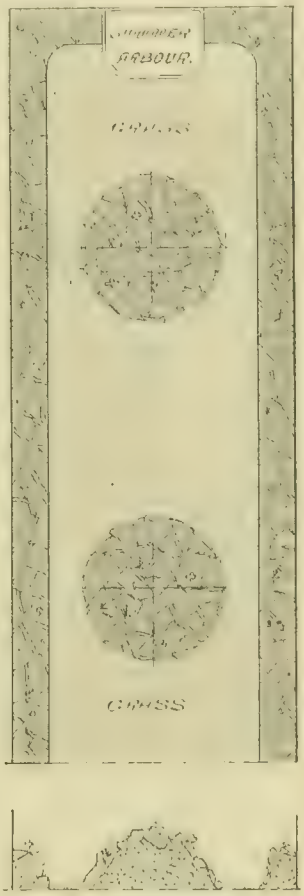
The planting of the Garden will depend in a great measure upon the taste of the owner, but not a little also upon the extent of his pocket. Dealing with Fig. 401, Cordon fruit-trees would succeed if planted in the border *a*, and trained up the sides of the house, unless the aspect were due north. If the aspect were south or south-west, Peaches and Nectarines would answer if desired, trained as fan-trees. On the other hand, the following climbers would be very



FIGS. 394 AND 395.
DESIGN FOR SMALL GARDEN.



FIGS. 396 AND 397.
DESIGN FOR SMALL GARDEN.



FIGS. 398 AND 399.
DESIGN FOR SMALL GARDEN.

amply repays the extra labour and expense incurred. Occasionally the walks are edged with strips of oak board, firmly secured to oak posts driven behind them. The oak posts and boards are nearly level with the surface of the lawn or grass edging. The advantages of such an edging are that the verges of the grass are always in place, there is no trouble in cutting them, and the sides always look neat and trim.

The next operation is the making of the lawn. This should be levelled and made thoroughly firm in every part. Unless made firm, portions will sink, and the surface become uneven later on. The beds, of course, would be marked out and made before. After having made the surface perfectly level, sow the seed thickly, and cover lightly with finely-sifted soil. The seed may be sown at almost any time of the year if protected from birds, but ornamental: *Azara integrifolia variegata* and *A. microphylla*, both with dense and handsome foliage; *Ceanothus Veitchianus*, a charming blue-flowered plant; *Cratægus Pyracantha Lelandii*, in winter covered with orange-red berries; *Garrya elliptica*; *Lonicera sempervirens* (Scarlet Trumpet Honeysuckle); *Magnolia grandiflora*, and any of the Ivies, of which there is a great variety. All the above are evergreen. If desired, the following deciduous climbers could be added: Roses in variety, Clematis, Honeysuckle, *Vitis inconstans* (*Ampelopsis Veitchii*), Jasminums, &c. The boundary wall or fence could be covered with espalier-trained fruit-trees, Roses, Ivies, Wistaria, whichever the owner preferred, all or any of which would be effective. The borders *c*, if planted with herbaceous subjects thinly, with bulbs, annuals, &c., dotted in amongst them, would be charming all

Garden—*continued.*

through the season and supply cut flowers in quantity. The following herbaceous plants are dwarf, and would not interfere with the plants or trees trained against the wall or fence: Anemone, Aquilegia, Campanula, *Coreopsis lanceolata*, Dicentra, Funkia, Gaillardia, Gerbera, Geum, Hemerocallis, Heuchera, Iris in variety, Linum, Montbretia, and Statice. Amongst bulbs there are Gladioli, Daffodils and other Narcissi, Hyacinths, Tulips, and many others. The varieties of annuals are almost endless; but any of the dwarf-growing sorts, if sown early in April, in fine, friable soil, and not allowed to become crowded as they grow, would produce an enormous quantity of flowers

FIG. 400. PEDESTAL FLOWER-VASE FOR GARDEN.

during the summer. The bed *d* might be planted with Carnations, Pompon or Cactus Dahlias, Tea-Roses, &c. If planted with the last-named, some of the early-flowering bulbs, like Daffodils or Hyacinths, could be grown amongst them, not disturbing the bulbs after flowering. The two long beds (*e*, *e*) could be planted with Roses, Rhododendrons, early-flowering Chrysanthemums, or anything else preferred. If Rhododendrons were planted, some of the Lilies (*L. auratum*, for instance) could be got in amongst them. As a rule, this splendid Lily seems to thoroughly enjoy such a position, and produces magnificent spikes of flower. The two circular beds (I, I) would be very effective planted with Pentstemons, Antirrhinums, or any similarly

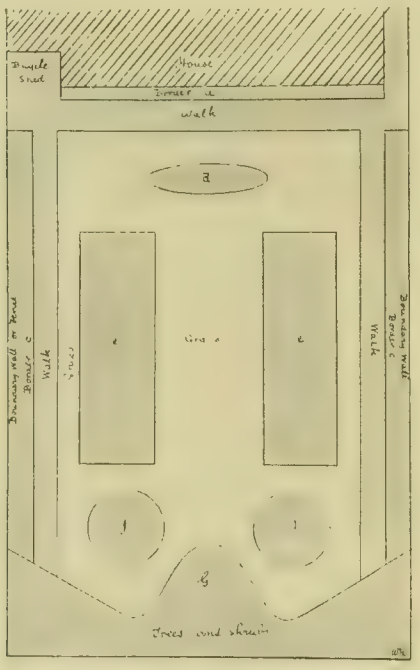


FIG. 401. DESIGN FOR SMALL GARDEN.

Garden—*continued.*

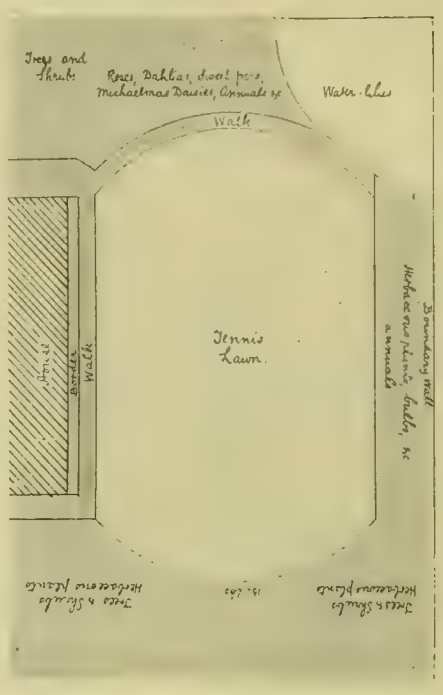


FIG. 402. COMMON TYPE OF VILLA GARDEN.

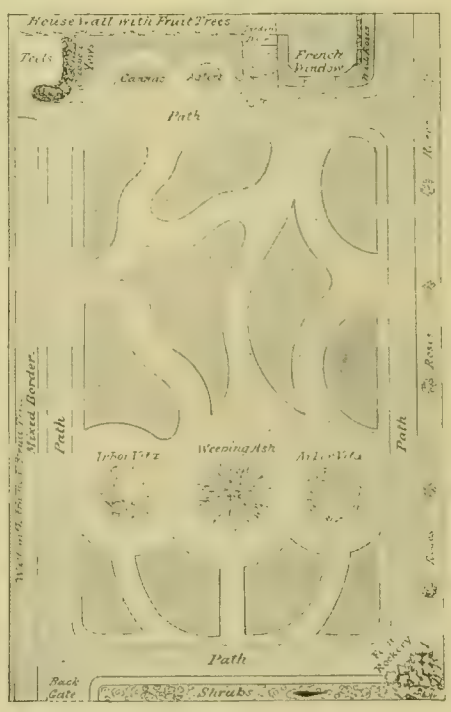


FIG. 403. DESIGN FOR GARDEN PRINCIPALLY DEVOTED TO FLOWERS.

Garden—*continued.*

beautiful yet inexpensive flowers. In brief, it may be stated that nearly all the hardy or semi-hardy plants, but chiefly the former, will prove far more desirable and pleasing than any of the tender bedding subjects so much in favour with villa Garden owners.

In most town Gardens it is desirable, as far as possible, to have a block at the bottom of the Garden, not only to make the place private, but also to shut out the everlasting view of bricks and mortar. For that reason the end (G) is marked as planted with trees and shrubs. Amongst those that seem to thrive in towns are *Cupressus Lawsoniana*, a quick-growing, tall, evergreen tree; all the Yews, Hollies, Tree Ivies, and the hardy Bamboo (*Bambusa Metake*). In deciduous subjects there are the beautiful Golden Privet, *Berberis* in charming variety, Acers in sorts, Prunus, *Azalea Mollis*, and Thorns. Many others might be included, but those named will produce a fine effect when well established.

Fig. 402 represents another form of Garden attached to villas, and, as will be observed, the major portion is devoted to grass for tennis or other games. This kind of Garden finds much favour, being both pleasing to the eye and inexpensive to keep in order. The subjects already recommended for planting against the house are also suitable for this one. Facing the trees and shrubs in the borders marked, such tall-growing plants as Sunflowers, Dahlias, Perennial Asters (or Michaelmas Daisies), and Rudbeckias, would have a good appearance. Facing those, again, Phloxes, early Chrysanthemums, and similar moderate-growing plants would answer, with bulbs of all kinds and annuals filling the space to the margin of the border. If a small pool of water could be made in one corner, the hardy Water Lilies would always prove a source of attraction; and when once established they would require no further care. It is marvellous the immense quantity of flowers these plants will produce, and no flower is more admired than Water Lilies placed in glass bowls in rooms. If the boundary walls are covered with Ivy, a nice finish is given to the whole place, which is thus made to look homelike, and any newness is done away with. Any new house may rapidly be made to appear as if built for many years by a judicious system of outside embellishment with trees, climbers, and other plants. The first cost may seem somewhat heavy, but when once done, the only outlay incurred afterwards is maintenance.

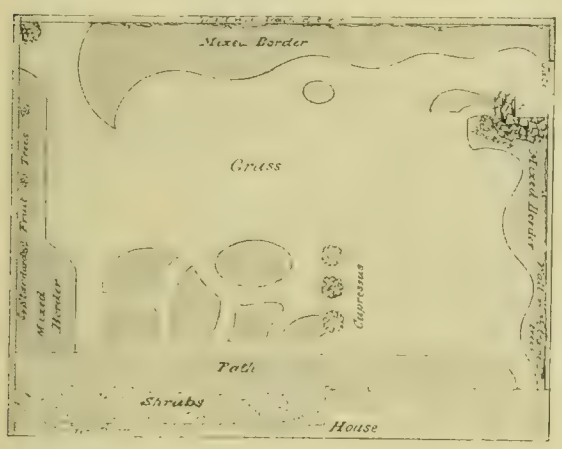


FIG. 404. GARDEN DESIGN IN WHICH THE PRINCIPAL FEATURE IS GRASS SPACE FOR TENNIS OR CROQUET.

Two other types of villa Gardens are shown at Figs. 403 and 404. Fig. 403, in particular, shows a method of laying out which is less formal than that usually employed for villa Gardens, the irregular-shaped beds when judiciously filled proving very effective, while the evergreen Arbor Vitæ and the graceful Weeping Ash used as lawn plants go to form a pleasing whole.

GARDEN BALSAM. *See* **Dianthera pectoralis.**

GARDENER. A term applied to one who has been trained in horticultural practice for a number of years, passing through the different grades of apprentice or student, journeyman, and foreman. In these days a Gardener must possess plenty of tact, ability to manage a staff, be well educated, and, above all, be thoroughly practical. Some knowledge of insect pests, plant diseases, and the chemistry of soils is also advisable.

GARDENIA. Several species formerly included hereunder are now referred to **Randia.** Gardenias may be grown in a temperature of from 60deg. to 85deg. from March to September; but during winter from 50deg. to 60deg., with less moisture, will suffice. The best soil consists of equal parts fibrous loam, sandy peat, and well-rotted dung. Syringing, as stated in the body of the work, is very beneficial except when the plants are flowering, when it should be discontinued. The plants known to commerce as *G. radicans* and *G. r. major* are much esteemed, as they flower freely in small pots.

To the species described on p. 52, Vol. I., the following should be added:

G. citriodora (Citron-scented). A synonym of *Mitriostigma axillare.*

G. grandiflora (large-flowered).* *fl.* white, large, solitary, lateral and terminal, six-parted, scented; calyx segments reflexed-falcate; corolla salver-shaped. *fr.* yellow, glabrous. *l.* lanceolate, shining. Cochin-China. An unarmed, greenhouse tree.

G. intermedia (intermediate). A form of *G. florida flore-pleno.*

G. jasminoides (Jasmine-like). The correct name of *G. florida.*

G. longistyla (long-styled). A synonym of *Macrosphyra longistyla.*

G. Maruba (Maruba). A synonym of *G. jasminoides.*

G. radicans is a form of *G. jasminoides.*

G. Sherbourniæ (Mrs. Sherbourn's). A synonym of *Sherbournia foliosa.*

G. hexagona has also been introduced, but is not in general cultivation.

GARDENING. This is now of national importance and of wide scope. It embraces not only the cultivation of gardens in the somewhat restricted sense, but also of fruit, vegetable, and flower culture for market. Such an industry provides employment for thousands of both men and women. It is scientifically known as **Horticulture.**

GARDEN PEBBLE MOTH. *See* **Pionea forficalis.**

GARDEN SPIDER. *See* **Spiders.**

GARDOQUIA. To the species described on pp. 52-3, Vol. II., the following should be added:

G. discolor (two-coloured). *fl.* purple; corolla ¼in. to ⅜in. long, distinctly bilabiate, pubescent. June. *l.* petiolate, ¼in. long, obovate or oblong, acute or obtuse, entire, narrowed at base, green above, woolly-tomentose beneath. Chili, 1827. A much-branched, greenhouse shrub.

GARNET BERRY. *See* **Ribes rubrum.**

GARRYA. A mistake frequently made in the culture of Garryas is that they are pruned at the wrong season of the year. They should never be cut back in summer. The best time is immediately they have done flowering and before new growth commences, as they are then given the full growing season in which to make and mature their wood. Shorten some of the breast-wood and remove the worn-out growths altogether, so as to encourage and make room for young, vigorous shoots. When grown in bush form keep the centre of the plants well thinned, so that the air can pass freely amongst the branches, as it is at the points of the previous season's matured shoots that the graceful catkins are borne during winter.

GARULEUM (name unexplained by its author). ORD. *Compositæ.* A small genus (three species) of greenhouse, South African, sub-shrubby plants, allied to **Lagenophora** (which *see* for culture). Flower-heads monœcious, radiate, terminal, pedunculate; ray florets blue, strap-shaped; disk florets yellow, tubular; receptacle convex, naked; involucral scales biseriate. Leaves alternate, pinnatifid, with toothed lobes. Only one species has been introduced.

Garuleum—*continued.*

G. pinnatifidum (pinnatifid). A synonym of *G. viscosum.*

G. viscosum (clammy). *fl.-heads*, ray-florets of a beautiful sky-blue; peduncles glandular and downy. Summer and autumn. *l.* lin. to 1½in. long, ⅔in. broad, pinnately cleft nearly or quite to the midrib. *h.* 1ft. to 2ft. 1774. Plant minutely velvety. SYN. *G. pinnatifidum.*

GAS-LIME. This contains small quantities of ammonia, also carbonate of lime, sulphate of lime, and sulphites of lime (combinations of quicklime and sulphuretted hydrogen), which are injurious to all forms of life, whether vegetable or animal, and therefore Gas-lime must be exposed to the air before applying to the soil, in order to oxidise these deleterious products and change them into sulphate of lime or gypsum. When used as an insecticide, it should be employed as fresh as possible. It will be found exceedingly beneficial if applied to soils affected by the disease known as Club-Root or Anbury in root crops and the *Brassica* family. In this case, it may be spread on the land in autumn and ploughed or dug in. From thirty to fifty bushels per acre may be used.

GASTERIA. Perianth tubular, curved; tube dilated into a ball in the lower half, cylindrical in the upper; segments small, ovate, sub-equal; stamens six, hypogynous. One of the best known species is *G. verrucosa* (Fig. 405).

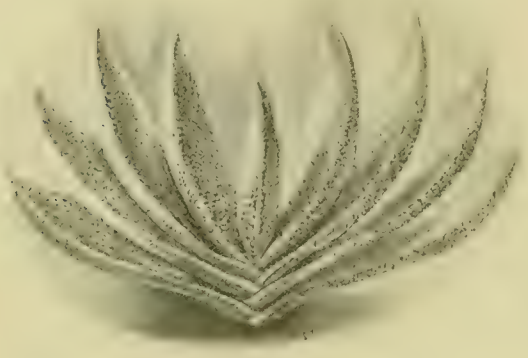


FIG. 405. GASTERIA VERRUCOSA.

To the species described on p. 54, Vol. II., the following should be added:

G. fuscopunctata (fuscous-dotted). *fl.* in a simple raceme 1½ft. to 2ft. long; peduncle simple, 1½ft. long. *l.* twelve to twenty in a dense, multifarious rosette, stiffly erecto-patent, lanceolate, 6in. to 12in. long, dull green, when old reddish-brown, with a few whitish and many brown spots. Leafy stem 2in. to 3in. long. 1860. (B. M. 7549.)

The following species have also been introduced during the last forty years, but they are rarely met with (some of them are in the Kew Collection): *G. apicroides, G. cheilophylla, G. colubrina, G. dicta, G. excelsa, G. gracilis, G. marmorata, G. pallescens, G. parvifolia, G. picta* (SYN. *G. formosa*), *G. planifolia, G. porphyrophylla, G. variolosa.*

GASTONIA PALMATA. A synonym of **Trevesia palmata** (which *see*).

GASTROCARPHA. A synonym of **Moscharia** (which *see*).

GASTROCHILUS (from *gaster*, a belly, and *cheilos*, a lip; in allusion to the swollen lip). ORD. *Scitamineæ.* A genus embracing about half-a-dozen species of stove, perennial or rarely annual herbs, natives of India and China, allied to *Hedychium.* Flowers solitary or spicate, often secund; calyx short, spathaceous; corolla-tube slender, the segments connivent, ascending; lateral staminodes petaloid, broader than the corolla-lobes; lip oblong, longer than the corolla segments, entire. Leaves oblong, acute. Leafy stem absent or present. Rootstock

Gastrochilus—*continued.*

wanting or creeping. The species introduced thrive in a sandy-loam compost, and may be propagated by division when new growth is commencing.

G. albo-lutea (white and yellow). *fl.* smaller, having a flat, white lip, lined with bright yellow. *l.* oblong, 9in. long. Otherwise like *G. longiflora.* Andaman Islands, 1894.

G. Curtisii (Curtis's). *fl.* white, having a yellow lip with a red margin, disposed in a cluster in the sheathing bases of the leaves. *l.* stalked, nearly 2ft. long, hairy beneath. Rootstock fleshy. Malaya, 1894. Allied to *G. longiflora.* (B. M. 7363.)

G. Jenkinsii (Jenkins's). A variety of *G. longiflora.*

G. longiflora (long-flowered). *fl.* one or two in radical spikes; corolla tube 3in. long, the white segments ½in. to 1in. long; staminodes white; lip tinged with red and crisped on the incurved margins. July. *l.* about four in a tuft, 6in. to 12in. or more in length, cordate or cuneate at base; petioles long, erect, channelled. Sikkim Himalaya, 1843. Plant stemless.

G. l. Jenkinsii (Jenkins's). *fl.* larger, of a purer white, the lip tipped with bright red. India, 1841. (B. M. 4010, under name of *G. Jenkinsii.*)

G. pulcherrima (very pretty). *fl.* white, many in terminal spikes 2in. to 3in. long, with imbricated bracts; corolla segments ½in. long; lip 1in. long, tinged with pink. August. *l.* sessile or shortly petiolate, 4in. to 6in. long, oblong, caudate. Rootstock creeping, usually producing a leafy stem 6in. to 12in. long. Tenasserim, &c., 1823.

GASTROCHILUS (of Don). Included under **Saccolabium** (which *see*).

GASTRODIA. SYNS. *Epiphanes* (of Blume), *Gamoplexis.* Flowers pedicellate, erect or nodding, in a rather lax raceme; column elongated (except in *G. Cunninghamii*). Stem simple, sheathed with many scales.

GASTROGLOTTIS. Included under **Liparis** (which *see*).

GASTROMERIA. A synonym of **Melasma** (which *see*).

GASTROPACHA QUERCIFOLIA. *See* **Lappet Moth.**

GATEN or GATER TREE. *See* **Cornus sanguinea.**

GATHERER. An instrument fashioned in the form of the averruncator, or standard tree pruner, with a small net or bag attached to receive the fruit when severed from the tree. Like the averruncator, it is made of various lengths to suit purchasers' requirements, and is convenient to gather fruits where they are beyond the reach of the hand, or when a ladder would be likely to damage the trees. No instrument, however, equals the hand for fruit gathering.

GAULTHERIA. The hardy sorts of *Gaultheria* berry much more freely if lifted and divided every fourth year or so. This especially applies to *G. procumbens*, which should, if possible, be shaded from the fierce mid-day sun. It is well adapted for planting as marginal lines to taller-growing subjects, especially in the American garden, and it forms an admirable carpet underneath such shrubs as the early-flowering *Daphne Mezereum* when planted in beds on the turf.

To the species described on p. 56, Vol. II., the following should be added:

G. discolor (two-coloured). A synonym of *Diplycosia discolor.*

G. fragrans (fragrant). A synonym of *G. fragrantissima.*

G. insipida (insipid). *fl.* white; corolla ⅓in. long; raceme shorter than the leaves. *fr.*, pericarp white, edible but insipid. *l.* shortly petiolate, 2in. to 3in. long, ovate, acuminate, entire or serrulate, rounded and ciliated at base, strigose-pilose on the veins beneath (as well as the petioles and branchlets). *h.* 2ft. to 3ft. Mexico, 1873. Half-hardy. (B. M. 6070.)

G. nummularioides (Moneywort-like).* *fl.* resembling those of the Lily of the Valley, but frequently tinged rosy-pink, axillary. Summer. *fr.* scarlet. *l.* roundish, deep green, changing in autumn to dull rose, ciliated on the margins. Stems wiry, sub-prostrate. Himalayas, 1834. An ornamental, hardy evergreen, suitable for baskets. (G. C. n. s., xxii., p. 457; P. F. G. ii., p. 164, under name of *G. nummulariæ.*)

G. odorata (scented). The correct name of *G. scabra.*

G. serpyllifolia (Thyme-leaved). A synonym of *Chiogenes hispidula.*

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Gaultheria—*continued.*

G. trichophylla (hairy-leaved). *fl.* pink or nearly white, about as long as the leaves, very shortly pedicellate, solitary, axillary, nodding. May. *fr.* blue, turbinate, five-lobed. *l.* ¼in. to ½in. long, spreading, ovate-oblong, entire or obscurely crenulate, with a few rigid bristles on the margin. Himalayas and China. A dwarf, tufted, hardy, evergreen shrub; the smallest known species. (B. M. 7635.)

The following have also been introduced: *G. bracteata*, *G. ferruginea*, *G. glabra caracasana*, and *G. Lindeniana*, but they are not generally cultivated.

GAYA. A synonym of **Seringia** (which *see*).

GAZANIA. Treasure Flower. SYN. *Melanchrysum.* Flower-heads often yellow, orange, dark brown, or reflecting peacock colours. For a sunny position amongst the dwarfer bedding plants, the showy *G. splendens* is most useful. Prior to being put out in the border in June, the plants should be hardened off. On no account should cuttings be taken in spring.

To the species described on p. 57, Vol. II., the following should be added:

G. bracteata (having prominent bracts). *fl.-heads* 2in. across; ray florets white; disk yellow; peduncles 6in. long. *l.* in a rosette, linear, 5in. to 8in. long. 1894. SYN. *G. nivea* (of gardens).

G. b. grandiflora (large-flowered).* A garden hybrid between *G. splendens* and *G. bracteata*. 1897.

G. b. latiflora (broad-flowered).* *fl.-heads* whitish or cream-coloured, large. 1897.

G. montana (mountain-loving). *fl.-heads* pale yellow. *l.* entire. 1899. A prostrate perennial.

G. nivea (snow-white), of gardens. A synonym of *G. bracteata*.

G. pinnata (pinnate). *fl.-heads* on peduncles not much longer than the leaves; involucral segments in two or three rows. *l.* radical, petiolate, 3in. to 8in. long, white beneath, hispid above, pinnati-partite (entire in the form *integrifolia*); lobes two to eight pairs, oval-oblong or linear. 1881. Perennial.

G. pygmæa (dwarf). *fl.-heads* small; ray florets about twelve, white, with a purplish band beneath; peduncles shorter than the leaves. *l.* all undivided, linear-spathulate, 2in. to 3in. long, obtuse, tapering to a ciliated petiole. Crown woody. Re-introduced in 1896. (B. M. 455.)

GAZANIOPSIS (from *Gazania*, and *opsis*, like; in allusion to the resemblance to *Gazania*). ORD. *Compositæ.* A hybrid, nearly allied to *Gazania* and *Gorteria*. It thrives in a well-drained garden soil in a sunny situation, and may be increased by seeds, or by cuttings, inserted under a bell glass, in a cold frame in late summer.

G. stenophylla (slender-leaved).* *fl.-heads* 3in. across, on long, leafless stalks; ray florets bronzy-green in the centre externally, of the richest golden-yellow internally; disk-florets of the same colour; involucral bracts numerous, running together at the base into a cup, the free ends leafy, about 1in. long, linear, ciliate at the edges. *l.* deep green above, long, linear, grassy, snowy-white beneath. South Africa. The flowers have the same habit of closing in the after-part of the day as those of *Gazania*.

GEISSOIS. Flowers purple, showy, disposed in simple, lateral racemes; calyx four- or five-parted; petals wanting; stamens ten to twenty. Leaves opposite, coriaceous, petiolate, digitately three- to five-foliolate, entire or serrated; stipules large, membranous.

GEISSOMERIA. The correct name of *G. longiflora* is *G. macrophylla*.

GEISSORHIZA. J. G. Baker refers thirty species to this genus. Stamens inserted at the throat of the perianth tube, the filaments short, free, filiform.

G. humilis (dwarf). The correct name of *G. setacea*.

G. obtusata is a variety of *G. imbricata*. The type is probably not in cultivation.

G. rochensis spathamæa (spathed). *fl.* several in a spike; stem forked. Plant more robust.

GEITONOPLESIUM (from *geiton*, a neighbour, and *plesion*, near; alluding to the fact that this genus is closely related to *Eustrephus latifolius*, another Australian plant). SYNS. *Calcoa*, *Luzuriaga* (of R. Brown). ORD. *Liliaceæ.* A monotypic genus, differing from *Eustrephus* only in inflorescence and in the entire (not fringed) inner perianth segments. For culture, *see* **Dianella.**

G. cymosum (cymose). *fl.* drooping, in loose, terminal cymes, sometimes short, simple, and few-flowered, sometimes several in an oblong panicle 3in. to 4in. long; perianth purplish-green, ¼in. long. *l.* varying from linear to ovate, 2in. to 5in. long. Stems climbing and twining. Australia, 1832. (B. M. 3131.)

GELA. A synonym of **Acronychia** (which *see*).

GELASINE. Two species, natives of tropical America, are referred to this genus. Flowers blue, fugitive, several in a spathe; perianth tube very short, the segments equal, obovate; stamens inserted at the base of the segments, the filaments united to the top in a cylindrical column. Leaves plicate. Rootstock a tunicated corm. *G. azurea* is the only species known in cultivation.

GELONIUM. Included under **Ratonia** (which *see*).

GEMBANGA. A synonym of **Corypha** (which *see*).

GENERA. The plural of **Genus** (which *see*).

GENISTA. Rock Broom. Including *Dendrospartium*. Standard ovate; wings oblong; keel oblong, slightly retuse or almost incurved, obtuse. Stipules minute or wanting. To the species described on p. 58, Vol. II., the following should be added. They are hardy, except where otherwise stated. Several plants formerly classed hereunder are now referred to **Cytisus.**

G. amsanctia. *See* **G. anxantica.**

G. Andréana (André's). A garden synonym of *Cytisus scoparius Andréanus.*

G. aspalathoides (Aspalathus-like).* *fl.* smaller than those of *G. anglica*, pubescent, in pairs, pedicellate, disposed in racemes. July and August. *l.* few, sessile, simple or trifoliolate, oblong linear, slightly silky. *h.* 1ft. to 2ft. North Africa. A dense, spiny bush, well suited to the rock-garden. SYNS. *Spartium aspalathoides*, *S. erinaceoides.*

G. cinerea (ash-grey). *fl.* solitary, sub-sessile at the sides of the branches; petals silky, sub-equal. Summer. *fr.* adpressedly villous. *l.* lanceolate, adpressedly pubescent. Branches striated, Rush-like. France, &c. (W. D. B., t. 76.)

G. corsica (Corsican). *fl.* pedicellate, axillary, solitary; keel as long as the glabrous standard. June and July. *l.* linear-lanceolate; stipules somewhat spine-like. Spines simple, rigid. *h.* 2ft. to 3ft. Corsica. A wholly glabrous, greenhouse shrub.

G. ferox (fierce). *fl.* racemose; calyx slightly pubescent; corolla glabrous. June and July. *l.* sessile, simple or trifoliolate, oblong, nearly glabrous. Branches numerous, striated, spiny at apex. *h.* 1½ft. Mediterranean region, 1800. Greenhouse.

G. germanica (German).* *fl.* slightly villous, borne in terminal racemes; keel longer than the standard and wings. June to August. *l.* lanceolate, slightly hairy. Spines simple or branched, the floriferous branches not spiny. *h.* 1½ft. to 2ft. Europe, 1775. A capital shrub for the rock-garden. SYN. *Scorpius spinosus.*

G. horrida (horrid). *fl.* few, almost terminal; calyx pubescent. Summer. *l.* petiolate, opposite, trifoliolate; leaflets linear, slightly silky. Branches opposite, angular, spiny. *h.* 3ft. Pyrenees, 1821.

G. juncea (Rush-like). A synonym of *Spartium junceum.*

G. monosperma (one-seeded). *fl.* white; petals silky, about equal; racemes lateral, few-flowered. June and July. *fr.*, pods ovate, inflated, one- or two-seeded. *l.* very few, linear-oblong, clothed with appressed pubescence. Branches erect, slender, twiggy. *h.* 2ft. to 4ft. Spain, &c. This shrub converts the most barren spot into a fine, odoriferous garden; it is largely used in Spain to stop the sand. (B. M. 683, under name of *Spartium monospermum.*)

G. Oweniana (Owen's). A hybrid between *G. Excrestiana* and *G. elegans.*

G. Rætam (Retam). The correct name of *G. Retama.*

G. ramosissima (much-branched).* *fl.* sub-sessile, clustered at the sides of the branches; petals silky, sub-equal. July. *l.* few, lanceolate, villous. Branches numerous, striated, slightly tubercled. *h.* 3ft. Southern Spain.

G. Scorpius (Scorpius). *fl.* shortly pedicellate, fascicled, glabrous; keel as long as the standard. April and May. *l.* very few, oblong, slightly silky. Spines branched, spreading, striated, glabrous. *h.* 3ft. to 4½ft. France and Spain, 1570.

G. sibirica (Siberian). *fr.* brown. Stems erect. *h.* 6ft. Siberia, 1735. Plant slenderer than *G. tinctoria* (of which it is only a variety).

G. s. filifer (thread-bearing). *fl.* pale yellow, numerous. 1896. SYN. *Cytisus filifer.*

G. tinctoria elatior (taller). A variety having a very large, paniculate inflorescence. *h.* 4ft. to 5ft. Caucasus.

G. triquetra (triquetrous). A synonym of *G. triangularis.*

G. virgata.* Old plants of this species attain as much as 6ft. to 10ft. in height, and are then very showy.

GENOSIRIS. A synonym of **Patersonia** (which *see*).

GENTIANA. SYNS. *Asterias, Ciminalis, Coelantha, Dasystephana, Ericala, Ericoila, Eudoxia, Eurythalia, Gentianella, Glyphospermum* (of G. Don), *Hippion, Pneumonanthe, Ulostoma.* To the species described on pp. 59-61, Vol. II., the following should be added:

G. acaulis alba cœruleo-striata (blue-striped). A variety with dark blue stripes upon the white petals.

G. a. albida (white). A white-flowered variety.

G. a. alpina (alpine). A variety with obovate, obtuse leaves.

G. a. azurea (blue). A variety with intense blue flowers.

G. a. Clusii (Clusius'). *fl.* dark blue, with spreading lobes, solitary, large; peduncle 1in. to 2in. high. *l.* rosulate, lanceolate, acute. Alps, 1888.

G. a. cœrulea albo-marginata (white-margined). *fl.* white and light blue, with dark blue streaks.

G. a. Kochiana (Koch's). *fl.* dark blue, large, solitary, with five blackish-green spots; lobes short, scarcely spreading; peduncle short. *l.* radical, elliptic, obtuse. Alps, 1888.

G. adscendens is a form of *G. decumbens.*

G. alpina (alpine). A form of *G. acaulis.*

G. arvernensis (Auvergne).* A beautiful little alpine Gentian, allied to *G. Pneumonanthe,* but more robust and tufted in habit, with much deeper blue flowers, and firmer and broader leaves. It lasts many weeks in blossom. 1882. Probably a form of *G. Pneumonanthe.* (F. & P. 1882, p. 75.)

G. asclepiadea alba (white).* A beautiful white variety of this well-known type.

G. barbata (bearded). A synonym of *G. detonsa.*

G. Bigelovii (Bigelow's). *fl.* violet, sessile, axillary, arranged in a leafy spike; calyx tube purplish, cylindric, with long-linear, green teeth; corolla about 1in. long, two subulate teeth alternating with the ovate, sub-acute lobes. August. *l.* linear or linear-oblong, 2in. long. *h.* 1ft. to 1½ft. New Mexico, 1886. (B. M. 6874.)

G. calycosa (having a prominent calyx).* *fl.* often solitary or three to five in a cluster; calyx lobes as long as the tube; corolla deep blue, about 1½in. long, dotted white at the base of the spreading lobes. *l.* opposite, partly connate, ovate, ¼in. to 1½in. long. Stems erect, 9in. to 12in. high, unbranched. North America, 1888. (R. G. 1888, t. 1270, f. a-c.)

G. carpathica (Carpathian). A form of *G. nivalis.*

G. Catesbæi (of A. B. R.) is synonymous with *G. Andrewsii.*

G. Catesbæi (of B. M.) is identical with *G. Saponaria.*

G. Charpentieri (Charpentier's). *fl.*, calyx five-toothed; corolla yellow, dotted with red. Swiss Alps, 1888. This is supposed to be a hybrid between *G. lutea* and *G. punctata*; it closely resembles the former.

G. ciliata. The correct name is *G. detonsa.*

G. Clusii (Clusius'). A form of *G. acaulis.*

G. decumbens (decumbent).* *fl.* blue, in a racemiform cyme; corolla narrow, obconical, with five short, ovate lobes. *l.* linear-lanceolate, scabrous on the margins. Stems ascending. Himalayas. (R. G. 1087, f. 1-2.)

G. d. Olivieri glomerata (Olivier's compact). *fl.* deep blue, usually very numerous, sessile or nearly so, densely cymose-subcapitate or in an uninterruptedly glomerate raceme. July. *l.* as in *G. Fetisowi,* but narrower. Turkestan, 1883. (R. G. 1069, f. 6-7.)

G. detonsa (clipped). The correct name of *G. ciliata* (of B. M.). SYN. *G. barbata.*

G. Fetisowi (Fetisow's). *fl.* deep blue, sessile, in terminal, compact clusters, and solitary or clustered in the axils; corolla tubular-campanulate, the segments slightly acute. July and August. *l.* narrow-lanceolate, five-nerved, entire; cauline ones connate; radical ones rosulate. Stem solitary, tall, erect. Turkestan, 1883. Plant highly glabrous. (R. G. 1069, f. 1-5.)

G. Fortunei. The correct name is *G. scabra.*

G. Frœlichii (Frœlich's). *fl.* solitary, on peduncles ¼in. to ½in. long, with a pair of leaf-like bracts at the base of the acutely five-toothed calyx; corolla blue, 1½in. long. *l.* rosulate, rather thick, linear-oblong or linear-oblanceolate, sub-acute, channelled. Stems short, somewhat tufted. Carinthia, 1888.

G. Gaudiniana (Gaudin's). *fl.*, calyx entire, with about one lobe, not spathaceous; corolla of a lurid purple, with more pointed lobes than in *G. purpurea.* Swiss Alps, 1888. A hybrid, closely resembling *G. purpurea,* but more robust. SYN. *G. spuria.*

G. Haengsti (Haengst's). A synonym of *G. Kummeriana.*

G. Kesselringi (Kesselring's). *fl.* whitish, dotted outside with violet, sub-sessile in glomerate, terminal racemes; corolla tubular-ventricose, the limb of five ovate, spreading lobes, shortly apiculate at apex. July and August. *l.*, radical ones numerous, linear-lanceolate, acute; cauline ones opposite, oblong-lanceolate. Stems about 8in. high. Turkestan, 1883. (R. G. 1087, f. 3-4.)

G. Kochiana (Koch's). A variety of *G. acaulis.*

Gentiana—*continued.*

G. Kummeriana (Kummer's). A hybrid between *G. lutea* and *G. pannonica.* SYN. *G. Haengsti.*

G. Kurroo brevidens (short-toothed). *fl.* blue, produced on prostrate stems 3in. to 5in. long. Himalayas, 1885. A variety of spreading habit.

G. montana (mountain-loving). *fl.* terminal or in the upper axils, paniculate or corymbose; corolla white or blue, striped, or passing into pink or purplish, and yellowish at base, ¾in. to 1¼in. in diameter. *l.*, radical ones rosulate; lower ones petiolate, obovate, or spathulate; upper ones more sessile, oblong-lanceolate or rarely almost ovate. *h.* 6in. to 18in. Australia and New Zealand. Hardy annual.

G. m. saxosa (rock-loving). *fl.* large, in compact corymbs. 1895.

G. Moorcroftiana (Moorcroft's). *fl.* solitary at the ends of the branches or in leafy cymes; calyx tube ¼in. long; corolla pale blue, ¾in. to 1¼in. long, funnel-shaped, the throat naked and without folds, the lobes ovate, ¼in. long. Summer. *l.* 1in. to 1½in. long, sessile, linear-oblong or elliptic, obtuse or sub-acute, nerveless. Stem simple or branched from the root. *h.* 4in. to 10in. Western Himalayas. Annual. (B. M. 6727.)

G. nivalis (snow-loving). *fl.* blue, solitary, like those of *G. verna,* but much smaller. Summer. *h.* 1in. to 4in. Europe (very rare on a few of the higher Scotch mountains), &c. A slender, erect, leafy annual, more or less branched.

FIG. 406. GENTIANA THIBETICA.

G. n. carpathica (Carpathian). *fl.* sessile, with a transparent, veiny calyx, and a funnel-shaped, five-cleft corolla. *l.* obovate, sessile, the upper ones distant. Carpathian Alps, 1888.

G. Olivieri (Olivier's). A form of *G. decumbens.*

G. oregana (Oregon). *fl.* few at the summit of the stem or occasionally scattered-racemose; corolla deep blue, over 1in. long, broadly funnel-shaped. September. *l.* ovate or ovate-oblong, 1in. to 1½in. long. Stem erect or ascending, 1ft. to 2ft. high. North America, 1892.

G. prostrata (prostrate). *fl.* solitary, terminal; corolla azure-blue, about ¼in. across. *l.* ovate, small, with white, cartilaginous or scarious margins. Stems often procumbent. *h.* 1ft. to 3ft. Europe, North America, &c., 1888. Hardy annual or biennial.

G. rubra (reddish). This closely resembles *G. lutea,* but the corolla is purplish outside, has no folds, and the tube is about equal to the lobes. Swiss Alps, 1888. SYN. *G. Thomasii.*

G. Saponaria (Saponaria). *fl.* usually several to a stem, sessile, clustered at the summit and often in the upper axils; corolla light blue, 1in. or more in length, with short and broad, erect lobes. August. *l.* varying from ovate-lanceolate to oblong or

Gentiana—*continued.*

broadly lanceolate, 2in. to 3in. long. Stem 1ft. to 2ft. high. North America, 1776. SYN. *G. Catesbæi* (B. M. 1039, not A. B. R. 418).

G. S. alba (white). A variety having white flowers. 1880.

G. saxosa (rock-loving). A form of *G. montana.*

G. scabra (rough). The correct name of *G. Fortunei.*

G. sceptrum (sceptre). *fl.* borne in terminal clusters; corolla deep blue, 1½in. to 2in. long. *l.* ovate to oblong-lanceolate, 1½in. to 3in. long. Stems fleshy, 2ft. to 4ft. high. North America.

G. spuria (spurious). A synonym of *G. Gaudiniana.*

G. thibetica (Thibet). *fl.* sessile, crowded in the uppermost axils; corolla yellowish-white, washed with lilac, not spotted, twice as long as the five-toothed calyx and having a fold in each sinus. *l.*, cauline ones 5in. to 7in. long, lanceolate, connate at base in a cylindric sheath; uppermost ones sessile, whorled. Stem simple, 1½ft. high. Eastern Himalayas, 1897. See Fig. 406. (B. M. 7523.)

G. Thomasii (Thomas's).* A synonym of *G. rubra.*

G. triflora (three-flowered). *fl.* blue, large and handsome, somewhat like those of *G. Pneumonanthe.* Late autumn. *l.* linear-lanceolate, smooth, glossy dark green. *h.* 1ft. Mountains of Central Asia. (R. G. 1189.)

GEODORUM. SYNS. *Cistella, Otandra.* Of this genus about nine species have been enumerated; they inhabit the East Indies, the Malayan Archipelago, and Australia. To those described on pp. 61-2, Vol. II., the following should be added:

G. candidum (white).* *fl.* white, ascending or erect, inodorous, less spreading than usual; petals almost orbicular; lip very broad, narrowed upwards from the two-crested base. Birma. A very distinct species.

G. Duperreanum (Baron Duperré's).* *fl.* nine to fifteen in a spike; sepals and petals white, linear-oblong; lip white, with purple veins, concave. *l.* three or four, oblong-lanceolate. Cochin China, 1883. A pretty Orchid.

GEOFFRÆA. A couple of species formerly included here will be found described under **Andira.**

GEOMETER MOTH. *See* **Moths.**

GEOMETRINA. *See* **Moths.**

GEONOMA. SYNS. *Gynestum, Vouay.* To the species described on p. 62, Vol. II., the following should be added:

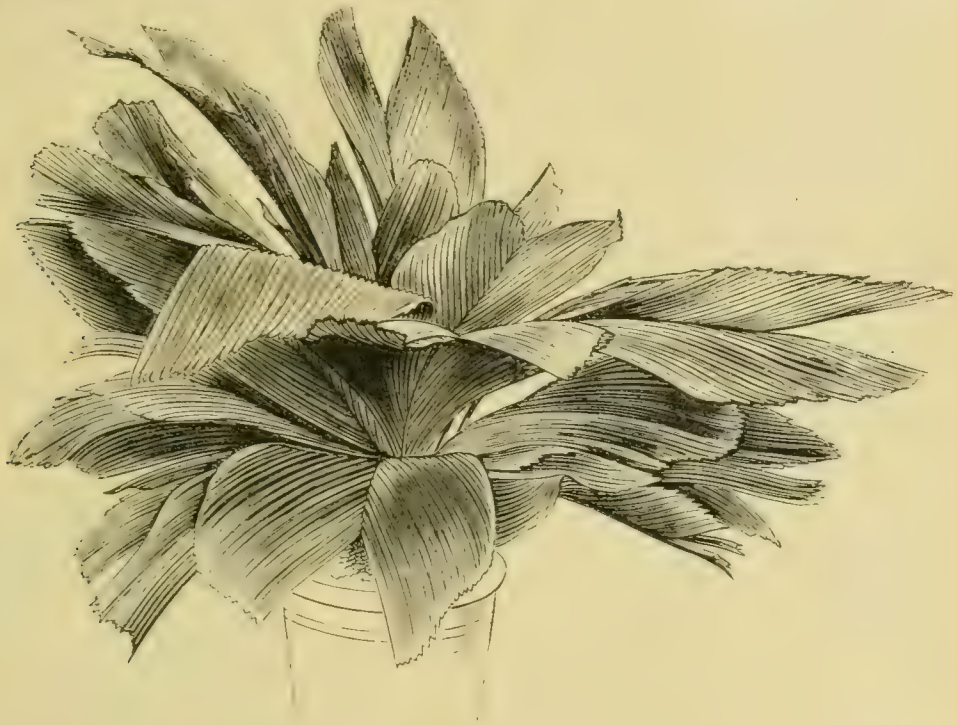

FIG. 407. GEONOMA PYNÆRTIANA.

G. verna æstiva (summer). A form with larger flowers than the type.

G. viscosa (clammy). A synonym of *Ixanthus viscosus.*

G. Wallichiana (Wallich's). *fl.* light blue, in axillary, terminal clusters. July and August. Stems 9in. to 12in. long, nearly prostrate.

G. Walujewi (Walujew's). *fl.* whitish, dotted pale blue, sessile, densely crowded in a head-like, terminal cyme; corolla ½in. in diameter, the lobes elliptic-lanceolate, acute. Late summer. *l.*, radical ones numerous, coriaceous, lanceolate, narrowed into short petioles; cauline ones sessile, elliptic or lanceolate, opposite. Stems solitary or twin, growing erect from the rosette of radical leaves. Turkestan, 1884. (R. G. 1140.)

GENTIANELLA. A synonym of **Gentiana** (which *see*).

GENUS. "A classificatory group comprehending a number of species (or sometimes a single species) possessing certain common structural characteristics distinct from those of any other group" (Murray).

G. acaulis (stemless). *fl.*, male and female spadices on the same or on different plants, radical; peduncle nearly 2ft. long. *l.* eight to twelve or more, pinnatifid, thickly congested, 3ft. to 4ft. long; leaflets lanceolate. Brazil, 1823. Plant stemless.

G. acutiflora (acute-flowered). A form of *G. baculifera.*

G. baculifera (small-berry-bearing). *fl.* dioecious; spadix borne beneath the fronds, drooping, simply branched. *fr.* blackish-violet, nearly elliptic. *l.* simple, cuneate-forked, or sometimes divided into four to six lobes. Stem 1in. to 1¼in. thick. *h.* 5ft. to 6ft. French Guiana.

G. b. acutiflora (acute-flowered). *fl.* acute, imbricated; spadix branched, pubescent. *fr.* black, shortly elliptic, as large as a Hazel-nut. *l.* 5ft. to 8ft. long, pinnatifid. Stem 6ft. to 8ft. high, rarely taller. Amazons, 1846.

G. binervia is the correct spelling of *G. binervis.*

G. Carderi. The correct name is *Prestoëa Carderi.*

G. decora (decorative). *l.* pinnate, borne on reddish-brown petioles; leaflets smooth, deep green, narrow. Habitat not recorded, 1894. A dwarf Palm. (I. H. 1894, p. 361, t. 23.)

Geonoma—*continued.*

G. deversa (turned aside). *fl.*, spadix reddish, flexuous, drooping, simply branched. *fr.* bluish-black, as large as a pea. *l.* borne on long petioles, divided into two or three pairs of oblong-lanceolate, acuminate-cuspidate leaflets. *h.* 2ft. to 3ft. French Guiana, 1846.

G. fenestrata (window-like). A synonym of *Malortica gracilis.*

G. Herbstii (Herbst's). A plant closely resembling *G. gracilis*, but broader in the leaf segments. 1889.

G. interrupta (interrupted). *fl.* imbricated; spadix paniculately multifid. *fr.* dark violet, shining, elliptic, as large as a Hazel-nut. *l.* terminal, 8ft. to 9ft. long, pinnatifid; leaflets falcate, acuminate. *h.* 6ft. Peru, 1849.

G. lacerata (torn). *l.* broad, bilobed, the lobes (in young plants) upwards of 1in. across, lacerately split at the apex, the surface ribbed so as to appear plicate; petioles broad, sheathing at base, flattened and slender upwards, angular on the dorsal side. Central America, 1869. (F. M. 1869, t. 446.)

G. maxima (largest). *fl.* monœcious; spadix slender, drooping, 1ft. long, borne below the leaves, compound-branched. *l.* terminal, pinnate, 4ft. long; leaflets twenty to thirty, lanceolate, acute, 3in. to 9in. long. Stem 1¼in. thick, erect, naked, whitish, noded. *h.* 10ft. to 12ft. French Guiana.

G. pinnatifrons (pinnate-leaved). *fl.* imbricated; spadix branched, pubescent. *fr.* the size of a pea. *l.* terminal, pinnatifid; pinnæ erose at the summit. Stem slender, 15ft. high. French Guiana, 1821.

G. Pohliana (Pohl's). *fl.* slightly fuscous, imbricated; male spadix nearly 2ft. long, much branched; female nearly equalling the male, but with fewer and slenderer branches. *fr.* ovate. *l.* 5ft. to 7ft. long, unequally pinnatifid; leaflets linear-lanceolate, somewhat falcate. Rio Janeiro.

G. Pynærtiana (Pynært's), of gardens.* *l.* shortly-stalked, apparently spineless, glabrous, the smallest 2½ft. by 10in., oblanceolate, gradually tapering to the base, divided at apex into two rounded, erose lobes with an acute sinus; midrib prominent on both surfaces. Malaya. A strikingly handsome Palm; according to the Kew authorities, it is an *Iguanura*, probably *I. Speranskyana*. See Fig. 407, for which we are indebted to the "Gardener's Chronicle." (G. C. 1898, xxiii., p. 258, f. 98; R. H. 1898, p. 262, f. 92.)

G. Seemanni (Dr. Seemann's).* *l.*, those first produced about 2in. long, the later ones 10in. long, broadish, bilobed, forming two sharp-pointed divisions, feather-veined, strongly plaited; petioles sheathing at base, with a broadish, scarious margin. Central America, 1869. Plant stemless. (F. M. 1869, t. 428.)

G. Siesmayeriana (Siesmayer's). This plant is described as "a species of tufted habit, with glaucous-green leaves which are tinted with red when young" (Catalogue, L'Horticulture Internationale, 1896).

G. Spixiana (Spix'). *fl.* imbricated; spadix 1ft. to 1½ft. long, paniculate, pubescent. *fr.* dark violet, shining, as large as a Hazel-nut. *l.* terminal, 4ft. long, undivided, lanceolate, cuneate at base, bifurcate at apex. Stem 6ft. to 8ft. high. Brazil, 1824.

G. tenuifolia (slender-leaved). *l.* like those of *G. gracilis*, but glaucous; young ones tinged with rose. Eastern Peru, 1895.

G. imperialis, *G. Princeps*, *G. pulchella*, and *G. zamorensis* have also been introduced, but are rare in cultivation.

GEOPHILA (from *ge*, the earth, and *phileo*, to love; in allusion to the dwarf habit of the species). ORD. *Rubiaceæ*. A genus embracing eight or ten species of slender, creeping, stove perennials, only differing from *Cephaelis* in their diminutive size. Only one has been introduced. It will thrive in a compost of sandy, fibry peat, leaf soil, and loam, with efficient drainage, and may be increased by seeds or by division.

G. picta (painted). *fl.* white, small, many in a head. *l.* ovate-oblong, 2in. long, dull green, with a pink midrib and pink hairs. British Guiana, 1896.

GEOPHILA (of Berger). A synonym of **Merendera** (which *see*).

GEOTRUPES STERCORARIUS. *See* **Shard-borne Beetle.**

GERANIUM. To the species and varieties described on pp. 62-4, Vol. II., the following should be added:

G. aconitifolium (Aconite-leaved). *fl.* white, 1in. to 1¼in. across; sepals long-awned; petals spreading, ovate, rounded at tip. May and June. *l.* 2in. to 2½in. across, three- to nine-parted; segments narrow, acute or obtuse; upper leaves sessile, with radiating lobes. *h.* 1ft. to 2ft. South Europe, India, &c., 1775.

G. armenum (Armenian).* *fl.* blood-red, very showy, about 1½in. across; petals obovate, retuse, black-spotted at base; peduncles long. Summer. *l.*, lower ones broadly cordate, five-parted; segments incised, acute, deeply toothed; upper leaves triangular; radical ones 6in. to 8in. across. *h.* 3ft. Orient. (R. H. 1881, 350.)

Geranium—*continued.*

G. gymnocaulon (slender-stemmed). A form of *G. ibericum.*

G. lancastriense (Lancaster). A form of *G. sanguineum.*

G. Lowii (Low's). *fl.* pink, in large clusters; stalks fleshy, 1ft. to 2ft. high. *l.* 3in. to 12in. in diameter, in five divisions, each division again deeply divided.

G. nodosum (noded). *fl.* purplish-red, striate-veined; petals emarginate. Summer. *l.*, lower ones five-lobed, upper ones three-lobed; lobes oblong, acuminate, serrated, clear beneath. Stems tetragonal. Europe (Britain, but not indigenous).

G. platypetalum (broad-petaled). A form of *G. ibericum.*

G. sanguineum album (white).* A lovely white form, free as to growth and desirable for either borders or rockeries.

G. sessiliflorum (sessile-flowered). *fl.* white and purple, almost sessile; petals small. *l.* thick, mostly radical, on long petioles, divided into five- or seven-lobed segments. Rootstock tap-rooted. Australia and New Zealand (in alpine districts), 1894.

G. subcaulescens (short-stemmed). *fl.* red; petals very blunt, longer than the villous calyx. *l.* almost radical, villous, rather greyish, five-parted; lobes blunt, three-toothed. Stem very short. Asia Minor. Allied to *G. asphodeloides.*

G. Traversii (Travers'). *fl.* light purple, streaked with carmine, large. *l.* silvery, similar to those of *G. argenteum*, but larger. New Zealand, 1898.

G. tuberosum Charlesii (Dr. Charles'). *fl.* rose-coloured, 1in. to 1¼in. across, the petals enlarging till they fall off. *l.*, radical ones none; lowest cauline ones long-petiolate, the uppermost ones sessile. Afghanistan, 1885. (B. M. 6910.)

GERARDIA. Including *Dasistoma* or *Dasystoma.* Flowers pedicellate or almost stalkless, sub-racemose at the tips of the branches, without bracteoles; calyx campanulate, five-toothed or five-cleft nearly to the middle; corolla tube broad, the limb spreading, with five rounded lobes; stamens four. To the species described on p. 65, Vol. II., the following should be added:

G. tenuifolia (slender-leaved). *fl.* pale violet, Pentstemon-like; corolla ¾in. or more in length; peduncles slightly exceeding the leaves. June to August. *l.* linear, acute, ⅛in. to ¼in. broad, light green. *h.* 1½ft. Mexico, 1894. A much-branched perennial.

FIG. 408. GERBERA JAMESONI.

GERBERA (named in honour of Gerber, a German naturalist, who travelled in Russia). ORD. *Compositæ*. A genus embracing about twenty species of greenhouse herbs, with a very short, perennial caudex, all African and Asiatic (temperate or mountainous regions). Flower-heads yellow, pink, or white, solitary, heterogamous and radiate, rarely homogamous and discoid; involucre turbinate or broadly campanulate, the bracts in two or more series; receptacle flat; pappus copious; scape naked or scaly. Leaves radical, entire or sinuate-pinnatifid. The three species introduced thrive in a compost of sandy loam and peat. Propagation may be effected by seeds or by cuttings of the side shoots. In favoured localities and in dry, sunny borders, *G. Jamesonii* may be grown outside; but in all other cases it is best treated as a greenhouse subject, still giving it a sunny but airy position.

G. asplenifolia (Asplenium-leaved).* *fl.-heads* purple; pappus reddish; scape cobwebby or woolly. *l.* narrow, 4in. to 6in. long, petiolate, pinnatifid or pinnatisect, Fern-like, reddish-tomentose beneath; lobes roundish, glossy above, concave, with revolute margins. South Africa. A handsome plant.

G. crenata (crenate).* A synonym of *Mairia crenata*.

G. Jamesoni (Jameson's).* *fl.-heads* solitary, sub-erect, 3in. to 4in. across; ray florets bright orange or flame-coloured above, about thirty, in one series, ligulate; scapes 10in. to 18in. long. Spring. *l.* 5in. to 10in. long, 2in. to 3in. broad, runcinately pinnatifid; petioles 6in. to 8in. long. Transvaal, 1888. See Fig. 408. (B. M. 7087; G. C. 1889, v., f. 122; Gn. 1889, xxxvi., p. 340, t. 722.)

G. viridifolia (green-leaved). *fl.-heads*, rays white above, yellow beneath. *l.* shortly petiolate, elliptic or oblong, 1½in. to 2½in. wide, obtuse, slightly tapering at base, entire or denticulate, green on both sides. Crown of root copiously silky. South Africa, 1896.

GERDARIA. A synonym of **Sopubia** (which *see*).

GERM. Broadly, that portion of a plant which is capable of development into the likeness of that from which it sprang; literally, the embryo in a seed or spore.

GERMAN CATCHFLY. See **Lychnis Viscaria.**

GERMANEA. A synonym of **Plectranthus** (which *see*).

GERRARDANTHUS (called after W. T. Gerrard, a collector at Natal). ORD. *Cucurbitaceæ*. A small genus (three species) of stove or greenhouse, tall, glabrous climbers, natives of Western and Eastern tropical Africa. Flowers greenish or fuscous, dioecious; calyx five-lobed; corolla rotate or campanulate, deeply five-parted; males racemose, with four stamens and an imperfect fifth; females solitary, with an elevated, trigonal ovary. Fruit small, elongated, terete, many-seeded. Leaves membranous, cordate or hastate-cordate. *G. tomentosus*, the only species known to cultivation, is a stove perennial, of botanical interest. Mr. Wood, now Superintendent of the Natal Botanical Gardens, is recorded to have found, on the top of and between large stones, tubers, one of which "measured 6ft. in circumference, and was nearly 2ft. thick; its surface was scarred; and from the centre arose a stem not more than ⅜in. in diameter, thickly covered with small, round tubercles, which ascended without a leaf to the top of trees 50ft. high. On turning over one of the tubers, it was found to have but one fibrous root, about ⅛in. thick. . . . The natives do not appear to put the plant to any use" ("Botanical Magazine," 6694). The plant may be increased by seeds.

G. tomentosus (downy). *fl.* yellow, ½in. in diameter, the males in short racemes, the females one or two together. August. *fr.* 3in. long, obovoid, ten-ribbed, dry, opening by three lobes. *l.* large, cordate-reniform, five-lobed. Natal, 1874. (B. M. 6694.)

GERSINIA. A synonym of **Bulbophyllum** (which *see*).

GESNERA. According to the "Index Kewensis," the correct spelling is that of Linnæus—*Gesneria*. Including *Dircæa*. To the species described on pp. 65-6, Vol. II., the following should be added. Many plants formerly classed under this genus are now referred to **Houttea, Isoloma, Nægelia, Paliavana,** and **Pentarhaphia.** The alterations in nomenclature are based on the "Index Kewensis."

G. amabilis (pleasing). A synonym of *Nægelia multiflora*.

G. Blassii (Blass').* *fl.* cinnabar-red, disposed in pendent panicles. *l.* ovate-cordate, acuminate, crenulate, the nerves

Gesnera—*continued.*

reddish on the under-surface. Stems pendent, woolly, as much as 6ft. long. Brazil. One of the prettiest species. SYN. *Dircæa Blassii* (F. d. S., t. 1140-1).

G. bulbosa. The correct name is *G. magnifica*.

G. caracasana (Caracas). *fl.* reddish, sulphur at base, the limb nearly blood-coloured, striated; peduncles axillary, solitary, one-flowered. Summer. *l.* elliptic, crenulate, petiolate, 3in. to 5in. long; upper ones sessile. Venezuela. Plant velvety-pubescent.

G. cardinalis (cardinal).* *fl.* of a beautiful bright red, velvety, large, cymose-umbellate, on long peduncles. *l.* ample, opposite, petiolate, cordate, rounded-obtuse, crenate; lower ones ovate-elliptic; upper ones nearly orbicular; uppermost ones sessile. Stem procumbent, terete. Rhizome tuberous. Origin unknown, 1850. Plant velvety-canescent. (Gn. 1892, ii., p. 874.) SYN. *G. macrantha* (of gardens).

G. Clausseniana (Claussen's). *fl.* orange-red, pendent, on long pedicels, forming simple, terminal racemes. Summer. *l.* ovate-cordate, rugose, tomentose. Stem simple, cylindrical. Tuber very thick. *h.* 2ft. to 4½ft. Brazil, 1840.

G. Donklarii. The correct spelling of *G. Donkelaariana*.

G. Douglasii (Douglas's). A synonym of *G. maculata*.

G. hondense is a species of *Isoloma*.

G. lateritia (brick-red). *fl.* scarlet, disposed in umbelliform racemes; corolla cylindrical-clavate, tomentose outside, 1½in. long. June. *l.* ovate-cordate, rounded at apex, crenulate, the lower ones 6in. long and 5in. broad. *h.* 2ft. Brazil, 1834.

G. latifolia (broad-leaved). *fl.* red, disposed in axillary cymes. *l.* ample, ovate-orbicular, crenulate. Stems simple, velvety. *h.* 3ft. Brazil. SYN. *G. macrostachya* (B. R. 1202).

G. Leopoldi (Leopold's). *fl.* bright red, tubular, the throat oblique, the lobes rounded; stamens violet; pedicels one-flowered; panicle umbel-like. *l.* shortly petiolate. Brazil, 1898. (Gn. 1898, i., p. 542, t. 1176.)

G. longiflora (long-flowered). A synonym of *Achimenes longiflora*.

G. macrantha (large-flowered). A garden synonym of *G. cardinalis*.

G. macrostachya (large-spiked). A synonym of *G. latifolia*.

G. maculata (spotted). The correct name of *G. purpurea* (B. M. 5115). SYNS. *G. Douglasii* (B. M. 3612), *G. verticillata* (B. M. 2716), *Dircæa picta* (L. J. F. 302).

G. magnifica (magnificent). The correct name of *G. bulbosa*.

G. polyantha (many-flowered). *fl.* scarlet, yellow in the throat, disposed in paniculate cymes; pedicels elongated. Summer. *l.* ovate-cordate, acuminate, toothed; lower ones petiolate; upper ones sessile, velvety, white beneath. *h.* 2ft. Stems obtusely tetragonal. Brazil, 1840.

G. polyantha (of B. M. 3995). A synonym of *G. discolor*.

G. purpurea. The correct name is *G. maculata*.

G. Sceptrum (sceptre). *fl.* white, disposed in elongated thyrses; corolla long-tubular; pedicels whorled in threes. Summer. *l.* also whorled in threes, cordate, obtusely toothed. *h.* 3ft. Brazil. The variety *ignea* has reddish-yellow flowers. (B. M. 3576.)

G. Sellovii (Sellow's). *fl.* scarlet, in lateral cymes, forming a thyrse; corolla cylindrical-claviform. July. *l.* ovate-cordate, acute, slightly toothed, tomentose, whitish beneath. Stems and branches pilose. *h.* 3ft. Brazil, 1835.

G. Suttoni (Sutton's). *fl.* scarlet; corolla pubescent, 1½in. long; pedicels axillary, solitary, one-flowered. July. *l.*, lower ones cordate, petiolate, tomentose; upper ones ovate, usually sessile. Stems branched. *h.* 1½ft. to 2ft. Brazil, 1833. (B. R. 1537.)

G. umbellata (umbellate). *fl.* amaranth-red, dotted, disposed in a terminal umbel. Summer. *l.* cordate, crenulate. Brazil. Whole plant velvety.

G. verticillata (whorled). A synonym of *G. maculata*.

GETHYLLIS. SYNS. *Abapus* and *Papiria*. To this genus J. G. Baker refers nine species; they much resemble *Crocus* in habit. To the species described on p. 66, Vol. II., the following should be added:

G. afra (African). *fl.*, perianth tube 3in. to 4in. long; limb 1½in. to 2in. long. August. *l.* twelve to twenty, linear, twisted, glabrous, strongly ribbed. 1820. A plant that flowered at Kew in 1887 "had the six stamens variously broken up into two, three, or four, and the segments much flushed with red outside." (B. R. 1016.)

G. lanceolata. The correct name is *Apodolirion lanceolatum*.

GETHYRA. A synonym of **Renealmia** (which *see*).

GETONIA. A synonym of **Calycopteris** (which *see*).

GEUM. Calyx persistent, with five imbricated, valvate lobes. Stamens numerous, usually clustered in several series. To the species, &c., described on pp. 66-7, Vol. II., the following should be added:

G. aleppicum (Aleppo). A synonym of *G. strictum.*

G. chiloense grandiflorum (large-flowered).* *fl.* of a bright scarlet, very large. A grand variety for grouping in mixed borders. SYN. *G. coccineum grandiflorum.*

G. c. miniatum (scarlet).* This and *G. hybridum* (also known as the Altrincham variety) are probably one and the same. The flowers last from April till the end of July.

G. coccineum grandiflorum (large-flowered). A synonym of *G. chiloense grandiflorum.*

G. Heldreichii (Heldreich's).* This is said to be a form of *G. montanum* with deep bright orange-red flowers. 1896.

G. hybridum (hybrid). Probably identical with *G. chiloense miniatum.*

G. miniatum (scarlet). A variety of *G. chiloense.*

G. montanum grandiflorum (large-flowered).* This is a very desirable variety, with larger foliage and deeper yellow flowers than the type. It is of garden origin, and sometimes catalogued under the name of *G. m. maximum.*

G. reptans (creeping). *fl.* yellow; petals obcordate, longer than the calyx. July and August. *l.*, radical ones interruptedly pinnatifid, the larger lobes obovate-cuneiform, deeply toothed at apex, the smaller ones ovate, entire or three-toothed; cauline leaves three-lobed. Sterile stems creeping; floriferous ones erect, undivided. *h.* 8in. Switzerland, Germany, &c. (Gn. 1886, ii., p. 479.)

G. rhæticum (Rhætian Alps).* *fl.* golden-yellow, 1in. across. Summer. *l.*, radical ones 3in. to 5in. long, lyrate, interruptedly pinnate; side pinnæ with coarse, deep serrations; terminal leaflet large, heart-shaped, lobed. Stems numerous, 6in. to 8in. high, erect, with three or four small, pinnate leaves. An interesting natural hybrid between *G. montanum* and *G. reptans*, discovered on the south side of Monte Rosa, 1886. (R. G. 1229.) SYN. *Sieversia rhætica.*

G. speciosum (showy).* This is described as a large plant, similar to *G. montanum*, with bright orange, large-petaled flowers. Caucasus, 1898.

G. urbanum (city-loving). *fl.* yellow, ½in. to ¾in. in diameter, terminating the branches of a very loose panicle; peduncle slender. May to July. *l.*, lower ones pinnatisect, the terminal leaflet 2in. to 3in. in diameter, orbicular, the lateral ones smaller; cauline leaves sessile, broad, variously cut and lobed. Stems 1ft. to 3ft. high. Europe, India, Australia, &c.

G. virginianum (Virginian). *fl.* white; petals cuneate-obovate, about as long as the calyx. June to August. *l.* variously divided; radical ones on long petioles; upper cauline ones nearly sessile. Stem 1ft. to 3ft. high. North America.

GEVUINA. According to the "Index Kewensis" this is the correct name of **Guevina** (which *see*, on p. 101, Vol. II.).

GHIESBREGHTIA. A synonym of **Calanthe** (which *see*).

GHINIA. A synonym of **Tamonea** (which *see*).

GHOST MOTH, or **GHOST SWIFT MOTH** (*Hepialus humuli*). Though a very common Moth, it is not as often recognised as a pest as it should be. The caterpillars at times are very destructive to the succulent roots of kitchen-garden produce, as well as to flowering bulbs, grass, and of course the Hop. Unfortunately, feeding as the larvæ do, concealed beneath plants, they are not readily reached. The cultivator may, however, minimise the attack perhaps by "collecting" the insects as soon as they are noted upon the wing, and killing them before the female has a chance of scattering her eggs. The larvæ and the spiny pupæ should also be destroyed when unearthed by digging. The use of certain volatile substances under the soil, like cyanide of potassium and bisulphide of carbon, has been recommended by some; but even if good results have been obtained from them, they are far too dangerous to be generally employed. *See also* **Otter Moth**, Vol. II.

GHOST SWIFT MOTH. *See* **Otter Moth**, Vol. II.; and **Ghost Moth**, in present volume.

GIAS. A synonym of **Bletia** (which *see*).

GIBRALTAR MINT. *See* **Mentha Pulegium gibraltarica.**

GIGANTABIES. A synonym of **Sequoia** (which *see*).

GILIA. Including *Ægochloa*, *Dactylophyllum* (of Bentham), *Linanthus*, and *Navarretia*. These are excellent plants for a sunny position, and should be freely planted by bee-keepers. To the species described on pp. 67-8, Vol. II., the following should be added:

G. californica (Californian). *fl.* rosy-lilac, 1¼in. in diameter; corolla lobes broadly cuneate-obovate, their margins often minutely erose. July. *l.* very crowded, soon widely spreading, all alternate, palmately three- to seven-parted, acerose or subulate, rigid and pungent. Western California, 1854. Half-hardy perennial. SYN. *Leptodactylon californicum* (B. M. 4872).

G. coronopifolia (Coronopus-leaved).* *fl.* scarlet, yellowish and dotted with red within, thyrsoid-paniculate; corolla 1in. to 1¼in. long, the lobes ovate. July to October. *l.* pinnately parted into filiform or narrow-linear divisions. Stem 2ft. to 4ft. high, very leafy throughout. South Carolina, &c., 1726. Half-hardy biennial; an excellent pot-plant. (B. R. 1691.) SYN. *Ipomopsis elegans.* Of this species there are several colour varieties.

G. dichotoma (dichotomous). *fl.* pure white, 1in. long, terminal or in the forks, sub-sessile; petals obovate. Summer. *l.* sessile, opposite, palmately cleft; segments three to five, subulate, entire. *h.* 6in. to 12in. California, 1833. Plant erect, dichotomously branched, highly glabrous. SYN. *Linanthus dichotomus.*

G. hybrida (hybrid).* The name applied to a fine race of garden hybrids between *G. androsacea*, *G. micrantha*, and *G. m. aurea.*

G. inconspicua. The correct name is *G. parviflora.*

G. lutea (yellow). A synonym of *G. micrantha.*

G. parviflora (small-flowered). The correct name of *G. inconspicua.*

G. pungens (pungent). A synonym of *G. squarrosa.*

G. squarrosa (squarrose). *fl.* blue or sometimes whitish, capitate-crowded and densely leafy-bracted; corolla slender, rather shorter than the calyx lobes. August. *l.* alternate, having their primary divisions incised or parted; upper ones and bracts spinescent. *h.* 1ft. California, 1847. SYN. *G. pungens* (B. M. 2977).

G. tricolor violacea (violet). A pretty variety having violet flowers with a dark eye.

G. nivalis (Snow Queen) (white) and *G. rosea splendens* (rose) are good garden varieties.

GILLIESIACEÆ. Included under **Liliaceæ** (which *see*).

GINGELLY OIL PLANT. *See* **Sesamum indicum.**

GINGER, WILD. *See* **Asarum europæum.**

GINGIDIUM (of F. Mueller). A synonym of **Aciphylla** (which *see*).

GINGILIE OIL PLANT. *See* **Sesamum indicum.**

GINGINSIA. A synonym of **Pharnaceum** (which *see*).

GINKGO. The soil best suited to the Ginkgo is a dry loam rather than a wet one. Though perfectly hardy, it is not advisable to plant in very cold, bleak situations, especially if the soil is inclined to be cold and improperly drained. Propagation is readily carried on by seeds sown in cold frames or in the open ground, provided the position is a sheltered one, and also by layering when practicable. The variegated forms are generally increased by grafting, which operation is best performed in spring on stocks of the type, established in pots, and placed in a warm house. The scions will be much benefited by an occasional light syringing overhead, but on no account must too much water be given, or there will be fear of damping off. Protection from the sun will be necessary until a union has been effected. The pendulous varieties may also be worked upon the common species.

GIPSIES' ROSE. *See* **Scabiosa arvensis.**

GISSANTHE. A synonym of **Costus** (which *see*).

GITHOPSIS (from *Githago*, the Corn Cockle, and *opsis*, resemblance; in allusion to the calyx). ORD. *Campanulaceæ.* According to Bentham and Hooker, this is a monotypic genus. The species is a small, pretty, half-hardy annual, resembling the Venus' Looking-glass (*Specularia Speculum*). For culture, *see* **Annuals.**

G. specularioides (Specularia-like).* *fl.* blue, simply terminating the stem or branches, or becoming lateral, strictly erect. *fr.*, capsule rigid, tapering into a very short and stout peduncle. *l.* small, sessile, linear-oblong, coarsely toothed. *h.* 2in. to 10in. California, 1894. Plant hirsute or glabrate. (G. C. 1894, xvi., pp. 244-5, f. 34.)

GLADIOLUS. About 140 species are referred to this genus by J. G. Baker. Stamens inserted at the throat of the perianth tube, contiguous and arching; filaments short, free; anthers linear, basifixed. A number of species formerly included here will now be found under **Acidanthera, Antholyza, Aristea, Babiana, Ferraria, Hesperantha, Ixia, Lapeyrousia, Melasphærula, Synnotia, Tritonia,** and **Watsonia.**

In order to grow this handsome garden favourite well, the ground requires preparation, and a light sandy soil is best. If the soil is heavy, it must be well drained, and some road- or river-sand spread thickly over the surface, and lightly forked in. The soil should always be prepared by trenching deeply the previous autumn. Cow- and stable-manure, mixed in equal proportions, and turned over two or three times, until the violent heat has abated and the manure has half-decayed, should be worked in during the process of trenching, one layer at the depth of 18in., and another at 9in. This would be the maximum depth. Sometimes the greatest depth would be 15in., and the lesser 6in. The ground should be prepared not later than October.

During winter and early spring, when the surface is dry, it should be lightly forked over. By the first week in March the ground is usually in good condition to plant out the first lot of corms. Drills as for Peas, 14in. apart, should be drawn, and the corms planted from 8in. to 12in. asunder, according to their size. The base of the corm should be placed about 4in. below the surface of the ground, some dry, clean, river- or silver-sand put under and over each, and the drill filled in again. The ground is often in a wet condition when the time arrives for planting out; if this is the case, still draw the drills, and use dry sand, but filling up the drill with some dry soil, usually siftings from the potting-shed. This gives the corms a good chance to start.

A fresh lot of corms should be planted every two weeks until the end of May, and this will give a succession of blossom until the end of the season. The plants soon appear above ground if the weather is favourable, and as soon as they are discernible the Dutch hoe must be run through them to lighten the ground and destroy weeds. The hoe may be used with benefit even if no weeds are to be seen.

Gladioli are exceedingly well adapted for cutting to place in rooms, if the spike is cut when the first four or six blossoms have opened; the remainder of the flowers will open in the house. Gladioli have the best effect if their own foliage is used.

A few of the very choicest varieties must also be selected to save seed from, and they must be cross-fertilised. This is easily done. The seed-bearing parent must be selected, and before the flowers are half-open the anthers pulled off with the fingers. When the flowers are fully expanded, the pollen from some superior variety should be taken when the flowers are also fully developed, and the stigma of the seed-bearer touched. This should be done on successive days, until the entire spike has been cross-fertilised.

The leaves of the Gladiolus remain green till very late in the autumn, but the corms should be lifted from the middle to the end of October. As they are forked out of the ground, cut the stalk off close to the crown, shake off the adherent soil, saving the bulblets, or "spawn," clustering round the base of the parent corm, spread the corms out in an airy place, and when well dried, store in boxes or bags until planting time; but they must not be exposed to frost.

To the species and varieties described on pp. 70-1, Vol. II., the following should be added:

G. Adlami (Adlam's). *fl.* greenish-yellow, five or six in a dense, simple, erect spike; perianth tube nearly straight, 1in. long, the segments oblong, acute, two of them granulated with red towards the tip. *l.* ensiform, 1ft. to 1½ft. long, 1in. broad at the middle, with distant, stramineous ribs. Stem 1ft. to 1½ft. long. 1839.

G. angustus (narrow). *fl.* white, two to six in a very lax, equilateral spike; perianth tube narrow-funnel-shaped, 1½in. to 2in. long, the three lower segments having a spade-shaped, purple mark in the centre. June. *l.* three or four, linear, flat, ¼in. to ½in. broad, the lower 1ft. or more in length. 1756. (A. B. R. 589; B. M. 602.) SYN. *G. trimaculatus.*

G. armeniacus (Armenian).* *fl.* deep purplish, small, numerous. Armenia, 1892. A handsome, dwarf species.

Gladiolus—*continued.*

G. atroviolaceus (dark violet). *fl.* dark purple, small, four to eight in a lax, secund spike. *l.* three, firm, linear, closely ribbed, 6in. to 12in. long. Syria, &c., 1839.

G. aurantiacus (orange). *fl.* bright orange-yellow or tinged with red, many in a lax spike sometimes 1ft. long; perianth tube curved, 2in. long, dilated suddenly in the middle, the upper segments 1in. to 1½in. long, the three lower shorter. *l.* four to six, ensiform, 1ft. to 1½ft. long, ½in. to ¾in. broad. Stem simple, about 3ft. long including the inflorescence.

G. a. rubro-tinctus (reddish-tinged). *fl.* orange-yellow, thickly dotted with red. 1894.

G. blandus albidus (white). *fl.* pure white. (A. B. R. 99, under name of *G. blandus*; B. M. 648, under name of *G. b. niveus.*)

G. b. carneus (flesh-coloured). The correct name of *G. b. campanulatus* (A. B. R. 183, under name of *G. campanulatus*).

G. b. Hibbertii (Hibbert's). *fl.* pink, with very distinct, red, spade-shaped blotches on the three lower segments.

G. b. Mortonius (Morton's).* *fl.* sub-erect; segments white, with copious vertical, faint pink streaks. 1837. (B. M. 3680, under name of *G. Mortonius.*)

G. carneus (flesh-coloured). A synonym of *G. cuspidatus ventricosus.*

G. Cooperi is a variety of *G. psittacinus.*

G. decoratus (decorated).* *fl.* bright purple, six to twelve in a very lax, secund spike; perianth tube curved, 1in. long, the upper segments ¾in. to 1in. long, the lower having a pale, spade-shaped blotch nearly filling the blade. *l.* three or four, ensiform, ½in. to ¾in. broad, very oblique at base, the lower ones 1ft. long. Stem 2ft. to 3ft. long. Moramballa, East Africa, 1890. Stove.

G. Eckloni (Ecklon's).* *fl.* bright red, copiously and minutely spotted, six to twelve in a very lax spike; perianth tube curved, ¾in. to 1in. long, the limb 1in. long, the upper segments ½in. broad, the lower ¼in. broad. Autumn. *l.* four to six, sub-basal, ensiform, rigid, with thick ribs, 1ft. long, 1in. to 1½in. broad. Stems robust, simple, 1½ft. to 3ft. long including the spike. 1862. (B. M. 6335.)

G. Elloni (Ellon's). *fl.*, perianth white, tipped with purple, star-shaped. 1890. Described as a pretty species in a Continental periodical, but not given by Baker in "Flora Capensis" (1896).

G. floribundus (of gardens). A synonym of *G. oppositiflorus.*

G. fusco-viridis (fuscous-green). *fl.* greenish, with minute stripes of claret-brown, about 2in. long; scape 2ft. long, bearing about a dozen flowers. *l.* ensiform, 1½in. long, 1in. broad. 1897. Allied to *G. dracocephalus.*

G. Hibbertii (Hibbert's). A garden form of *G. blandus.*

G. hirsutus (hairy).* *fl.* bright red, three to six in a very lax spike; perianth tube curved, 1½in. long, the segments 1½in. long. June. *l.* four to six, short, ensiform, rigid, very strongly ribbed, both blade and sheath finely hairy. Stems simple, hairy, 1ft. to 2ft. long including the spike. 1795. SYNS. *G. hirsutus roseus* (B. M. 574), *G. roseus* (A. B. R. 11).

G. illyricus (Illyrian). *fl.* bright purple, three to six in a lax, secund spike; perianth tube ½in. long, the limb 1in. long. *l.* two or three, linear, laxly nerved, ½in. broad. Stem slender, 1ft. to 1½ft. long. Europe (Britain), Asia Minor, &c.

G. i. Reuteri (Reuter's). *l.* narrower and stem slenderer than in the type. Spain and Portugal. SYN. *G. serotinus.*

G. imbricatus (imbricated). *fl.* dark purple, four to ten in a secund spike; perianth tube ½in. long, the segments obtuse, 1in. long. June. *l.* two or three, linear, laxly veined, ½in. to ¾in. broad. Stem slender, 1ft. to 1½ft. long. Eastern Europe, &c., 1820. SYN. *G. neglectus.*

G. Kirkii (Sir John Kirk's). *fl.* in a lax, secund spike 6in. to 12in. long; perianth tube ½in. long, the segments pale pink, unspotted, cuspidate, 1in. long. *l.* five or six, linear, glabrous, firm, strongly ribbed, slightly glaucous, 1ft. to 1½ft. long, ½in. to ¾in. broad. Stem terete, 3ft. long including the spike. 1890.

G. Kotschyanus (Kotschy's). *fl.* light violet, about 1½in. long, with a nearly regular limb, the lower segments rather paler than the others, with a dark, median stripe; spike loosely few-flowered; scape 1ft. to 2ft. high including the inflorescence. May. *l.* three, linear, 6in. to 8in. long. Afghanistan, Persia, 1886. (B. M. 6897.)

G. Leichtlini (Leichtlin's). *fl.* bright red; perianth tube arcuate, 1½in. long, the upper segments connivent, the three lower much smaller, red at the tip, yellow below it; spike dense, secund. *l.* four, ensiform, bright green, 1ft. long. Stem terete, 2ft. long. 1889.

G. Lemoinei (Lemoine's). The type of a series of hybrids with bright yellow and bright red flowers, having large, purplish-brown blotches at the base of the lower segments; they have been raised by M. Lemoine, of Nancy, by crossing *G. gandavensis* with *G. purpureo-auratus.* Three are figured in Gn., July 24, 1886.

Gladiolus—*continued.*

FIG. 409. EARLY GLADIOLUS THE BRIDE.

G. Ludwigii (Ludwig's). *fl.* pale yellow; perianth tube funnel-shaped, ¾in. long; the three upper segments oblong-spathulate, the three lower ones unguiculate; spike distichous, twenty- to thirty-flowered. *l.* pilose, about six in a sub-basal, distichous rosette, rigid, with thick ribs, 2ft. to 3ft. long. Stem pubescent, 2ft. to 3ft. long including the spike.

G. L. calvatus (bald). A variety having the rachis of spike, leaves, and stem glabrous. SYN. *G. ochroleucus* (B. M. 6291).

G. marsiliensis (Marseilles). The type of a new race of garden hybrids between *G. psittacinus* and *G. gandavensis*. 1894.

G. Mortonius (Morton's). A variety of *G. blandus*.

G. nancieanus (Nancy). A hybrid raised by M. Lemoine between *G. Saundersii* and one of the *G. Lemoinei* hybrids.

G. natalensis (Natal). A synonym of *G. psittacinus*.

G. neglectus (neglected). A synonym of *G. imbricatus*.

G. ochroleucus (yellowish-white), of B. M. A synonym of *G. Ludwigii calvatus*.

G. oppositiflorus (opposite-flowered). *fl.* white, thirty to forty in a distichous spike often 1ft. long; perianth tube curved, 1in. to 1¼in. long, the limb 1¼in. long, horizontal, the segments ¼in. to ½in. broad. *l.*, basal ones about four, firm, 1ft. to 1½ft. long, ¾in. to 1in. broad. Stem 3ft. to 4ft. long including the spike, often branched. 1892. (B. M. 7292.) SYN. *G. floribundus* (of gardens).

G. Papilio atratus (dark).* A fine variety, the ground-colour of the flowers being dark purple instead of yellow. 1885.

G. Papilio-gandavensis (hybrid). A garden hybrid between the species and hybrid indicated in the name. 1893.

G. platyphyllus (broad-leaved). *fl.* deep yellow, veined with red; perianth tube nearly 2in. long; spike 6in. to 12in. long. *l.* broader than in any other known species, being broadly ensiform, 1ft. long and nearly 2in. broad. 1893. Allied to *G. dracocephalus*.

G. præcox (early). A synonym of *G. Watsonius*.

G. primulinus (Primrose-yellow).* *fl.* Primrose-yellow, four or five in a lax spike; perianth tube much curved, 1in. long, the upper segments much imbricated, 1¼in. long, the lower smaller. *l.*, basal ones three, ensiform, strongly ribbed, the lowest 1ft. long, ¾in. broad. Stem 1½ft. long. South-east Tropical Africa. 1889. Stove.

G. psittacinus Cooperi. The correct name of *G. Cooperi*.

G. punctatus (dotted). *fl.* large; perianth greenish-yellow inside, striated with purple in the centre of the three superior segments, striated and dotted with purple outside; spike loose, unilateral, three- to six-flowered. *l.* three or four, 6in. to 12in. long. Stem 1½ft. high. 1839.

G. Quartinianus superbus (superb). *fl.* yellow, flushed with crimson, larger than in the type. 1893. (G. C. 1893, xxiv., p. 467, f. 140.)

G. ramosus (branched).* *fl.* bright red, openly funnel-shaped, with dark blotches at the base of the three lower segments. A hybrid between *G. cardinalis* and *G. oppositiflorus*. The florists' flowers of this group are hardier and flower earlier than those of the *gandavensis* section.

G. ringens (gaping). A synonym of *G. recurvus*.

G. roseus (rosy). A synonym of *G. hirsutus*.

G. serotinus (late). A synonym of *G. illyricus Reuteri*.

G. trimaculatus (three-spotted). A synonym of *G. angustus*.

G. tristis concolor (one-coloured). A variety with flowers wholly white or pale yellow. (B. M. 1093.)

G. turicensis (Zurich). A garden hybrid between a variety of *G. Saundersii* and *G. gandavensis*.

G. Victorialis (Victoria's). *fl.* bright pale crimson; spike 1ft. long, sometimes forked. 1893. A hybrid between *G. communis* and *G. cardinalis* or *G. Colvillei*.

G. vinulus (reddish). A synonym of *G. vittatus*.

G. vomerculus (resembling a small ploughshare). The correct name of *G. hastatus*.

G. watsonioides (*G. Watsonius*-like). *fl.* four to ten in a very lax, unilateral spike; perianth bright scarlet, the tube curved, 1½in. long, the segments oblong or ovate, acute, 1in. long; spathe valves curved, leafy, lanceolate. June. *l.*, produced ones about four, linear, erect, firm, 1ft. to 1½ft. long. Stem erect, 2ft. to 3ft. long, with usually a couple of much-reduced leaves below the inflorescence. Kilimanjaro, 1886. (B. M. 6919.)

G. Watsonius (Watson's).* *fl.* two or three, each standing on a peduncle-like tube, enclosed by a bifid spathe; corolla bright red, funnel-shaped, the segments ovate-lanceolate, spreading. February and March. *l.* three or four, 3in. long, upright, rigid, flat, linear-lanceolate. Stem 1ft. to 1½ft. high. (B. M. 450.) *Antholyza revoluta* is now the correct name of this species. SYN. *G. præcox* (A. B. R. 38). A variety in which the segments are variegated with yellow from the base about half-way up, is figured in B. M. 569.

Varieties. Of all Gladioli now grown the Early-flowering section is one of the most useful, providing flowers through late spring and early summer outside, and correspondingly

FIG. 410. EARLY GLADIOLUS BLUSHING BRIDE.

Gladiolus—*continued.*

FIG. 411. GLADIOLUS INSIGNIS.

earlier when grown under glass. In this are included several well-known kinds like *Colvillei* The Bride (Fig. 409), *cardinalis*, *byzantinus*, *Brenchleyensis*, Blushing Bride (Fig. 410), and Insignis (Fig. 411). Following these come the hybrids associated with the name of Lemoine, some of the best embracing Beauty, Boussingault, Castelar, Dagmar, De Humboldt, Duguesclin, Etoile Polaire, E. V. Hallock, Holland, Hypatia, Louis Thibaut, Mirabeau, Oriflame, Venus de Milo, Voltaire, and Xenia. These bridge over the gap between the early- and the late-flowering kinds. The spikes are large, freely produced, and yield flowers of a very brilliant colour. They are of good constitution, and on warm, sandy soils may be left out all winter provided their quarters are lightly covered. Sometimes Lemoine's hybrids are spoken of as Spotted Gladioli, by reason of the fact that the petals are elegantly blotched. Yet other sections are the Giant-Flowered Childsii (Fig. 412), of which Aurea Superba, Ben Hur, Cavour, Mrs. Beecher, and W. Falconer are good types; and the Large-Flowered Nancieanus, like Jules Finger, Pasha, and William Watson. Yet another Large-Flowered section, characterised by lovely colouring, is that known as Kelwayi (Fig. 413), in which may be found such gems as Arthur Toms, Burne Jones, Carlton, Eugene Sandow, J. G. Clarke, Nana, Richard Martin, Richard Milner, and Snowdrift.

Lastly, there is the ever-popular *gandavensis* section, of which the varieties appended may be recommended:

A. F. BARRON, scarlet, streaked with white; ALFRED HENDERSON, vermilion-scarlet; APPIANUS, white, blotched with rose; BELLINI, white, striped violet; BONO, crimson, tinged purple; DUCHESS OF EDINBURGH, purplish-rose, striped carmine; GALATEA, blush; HOWARD MAYNARD, scarlet, with yellow throat; JAMES KELWAY, crimson, lined with white; LORD IDDESLEIGH, scarlet, white centre; MR. GLADSTONE, scarlet-crimson, light centre; MRS. LANGTRY, white, purple tinted; MRS. LAXTON, rose, white centre; NAUTCH GIRL, light red, flaked crimson; NUMA, white, flaked carmine, yellow centre; PRINCE HENRY, purple, with white throat; PRINCESS ROYAL, blush, with rose mottling; ST. GATIEN, brilliant red, white lines; SILENUS, crimson, striped violet; THOMAS MOORE, scarlet-crimson, violet blotch; WILLIAM KELWAY, scarlet-crimson, blotched white.

Gladioli are very effective as cut flowers, particularly in groups of nicely assorted colours, with their foliage (Fig. 414).

GLAND. A secreting apparatus; a wart-like swelling.

GLAND BELLFLOWER. *See* **Adenophora.**

GLANDULIFOLIA. A synonym of **Adenandra** (which *see*).

GLAPHYRIA. Included under **Leptospermum** (which *see*).

GLASS CASES. These may range from the small bell glass to the long Cases covering many feet or yards of wall, under which are planted some of the choicer kinds of hardy fruits, such as Peaches, Nectarines, Cherries, Pears, &c. Small bell glasses are employed for growing delicate plants that require some such protection, both in hot-houses and outside. Large Cases are used for filmy Ferns, and the well-known Wardian Case is in request for plants in rooms. Whether such Cases are in hot-houses or in rooms, fresh air should be admitted daily to sweeten the internal atmosphere, and to allow moisture to escape. Glass Cases employed for fruit-growing against walls are not heated artificially, but much may be done by closing the Case early with a good sun heat—bottling the natural heat, as it were. By means of Glass Cases, excellent crops of fruit are annually obtained from walls that would otherwise fail through climatic conditions.

FIG. 412. GLADIOLUS CHILDSII.

GLASS HOUSES. *See* **Conservatory, Greenhouse, Orchard House, Orchid House,** Vinery (under **Vine**), &c.

GLAUCIUM. Sepals two; petals four; stamens indefinite. To the information given on p. 71, Vol. II., the following should be added:

G. corniculatum phœniceum. The correct name of *G. phœniceum.*

G. Fischeri (Fischer's).* *fl.* flame-coloured. *l.* covered with snow-white wool. A handsome species.

G. squamigerum (scale-bearing). *fl.* yellow, 1½in. in diameter; capsule covered with scales. *l.*, radical ones lyrate, pinnatifid, cauline ones few, minute, sessile. Altai Mountains.

GLEDITSCHIA. To the species described on p. 72, Vol. II., the following should be added:

G. carolinensis (Carolina). A synonym of *G. monosperma.*

G. ferox (fierce). *l.* bipinnate; leaflets lanceolate, acute. Spines trifid, much compressed. *h.* 18ft. to 20ft. China. Probably a form of *G. macracantha.* SYN. *G. orientalis.*

G. orientalis (Eastern). A synonym of *G. ferox.*

GLEICHENIA. Including *Mecosorus* and *Mertensia* (of Willdenow). There is no British representative of this genus, which, however, is widely distributed. One species, *G. dichotoma* (Fig. 415), is particularly widely dispersed, being found in the New and in the Old World, in the Pacific Islands, and as far north as Japan.

CULTURE. In the majority of cases cool treatment is the most suitable for Gleichenias, and with very few exceptions they fare best in a house where during the winter the temperature falls as low as 45deg. In fact, most, if not all, of the failures experienced in the early attempts at cultivating these charming plants may be traced to the

FIG. 413. KELWAY'S HYBRID GLADIOLI.

Gleichenia—*continued.*

FIG. 414. A GROUP OF HYBRID GLADIOLI.

pernicious practice of growing them in too much heat—treatment which causes them to make stunted growths, generally full of thrips and scale. Besides the house being at most what is usually called intermediate, it should also be light and well ventilated. Bright light is indispensable in the culture of Gleichenias; they will even withstand a little sunshine during the morning and the afternoon, and be benefited by it. Light, in fact, is of such importance that if a plant in perfect health be placed under, say, Tree Ferns, or under any other plant that will permanently shade it, it will soon retrograde, and show by its spindly growth that it does not at all appreciate the presence of neighbours taller than itself. It is also worthy of note that success cannot reasonably be expected unless these plants are in a perfect state of cleanliness.

The plants comprised in the section *Eugleichenia* are provided with rhizomes of a particularly slender and naturally hard nature. They are very shallow rooters, and when not planted out should be grown in rough, sandy peat, in pans. Their rootlets being short and exceedingly brittle, it is necessary that the rhizomes from which they are produced should receive special attention at the hands of the cultivator; and as these have a particular objection to being buried underground, they must be carefully kept on the surface by being pegged on the potting material, which must be made firm, if not altogether hard. It is therefore indispensable that the plants should have abundance of pot-room, so as to give the rhizomes every facility for spreading. The pans should be well drained, as, stagnant moisture at the roots is injurious.

Not only do the plants belonging to the *Mertensia* section differ from the others by their general appearance, but they are provided with rhizomes of a totally different nature, being fleshy, brittle, much stouter, and usually root deeply into the ground of their own accord. For these, a mixture of two parts fibrous peat, one part fibrous loam, and one part of sand is preferable to the

Gleichenia—*continued.*

sandy peat recommended for the first-named section. They require a quantity of water at the roots, though stagnant moisture must carefully be avoided. Plants of both sections are better for being at all times kept dry overhead. One of the most distinct species in the *Mertensia* section is *G. pubescens* (Fig. 416), which has a peculiar cobwebby underside to its handsome frond.

One of the principal causes of the scarcity of Gleichenias in general collections is attributable to their slow propagation, as, with the exception of seedlings of *G. circinata speluncæ* and *G. c. semi-vestita* of commerce, and of *G. rupestris*, which have at various times been raised at Messrs. J. Veitch's establishment, the mode of increase has always been limited to the division of clumps, an operation which is very tedious, extremely hazardous, and seldom attended with complete success. We have

FIG. 415. FROND OF GLEICHENIA DICHOTOMA.

never heard of seedlings of plants belonging to the *Mertensia* section being raised in this country, and that, together with the fact that the importations direct from their various habitats seldom give entire satisfaction, is probably the reason why they are so rare. Moreover, the difficulties, real or imaginary, to be encountered in the cultivation of Gleichenias have tended to keep them out of many collections; but, thanks to successful growers of these plants having made public the knowledge of their requirements, and endeavoured to simplify their culture, we are rapidly gaining ground.

Gleichenia—*continued.*

FIG 416. PORTION OF FROND OF GLEICHENIA PUBESCENS.

To the species and varieties described on pp. 72-3, Vol. II., the following should be added:

G. circinata glauca (glaucous). A synonym of *G. c. Mendelli.*

FIG. 417. PORTION OF FROND OF GLEICHENIA CIRCINATA SEMI-VESTITA.

G. c. Mendelli (Mendell's).* *fronds*, under-part of the lobes, which are perfectly flat, of a beautiful silvery colour. Plant much more robust than the type. One of the most distinct and free-growing kinds in cultivation. It is shown at Fig. 113, p. 73, Vol. II. (erroneously called *semi-vestita*). SYN. *G. c. glauca.* The true *semi-vestita* is shown in Fig. 417.

Gleichenia—*continued.*

G. c. speluncæ (cavern-loving). *fronds* pendent, abundantly produced, varying considerably in size and ramification; segments loosely set, curved inwards, forming little cavities; under-surface silvery-glaucous, the upper pale green. New South Wales.

G. Mendelli (Mendell's). A form of *G. circinata.*

G. rupestris glaucescens (glaucous). *sti.* reddish-purple. *fronds* glaucous, much thicker in texture than in the type.

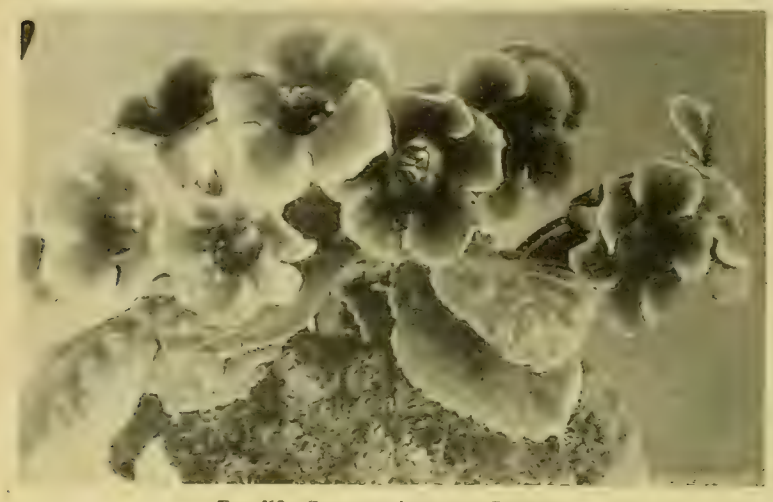

FIG 418. GLOXINIA AIGBURTH CRIMSON

GLOBBA. SYNS. *Hura* (of Kœnig), *Manitia*, *Sphærocarpos.* Leaves lanceolate, rarely ovate, often produced into a tail-like point. To the species described on p. 73, Vol. II., the following should be added. One or two plants formerly included hereunder are now referred to **Alpinia.**

G. alba (white). A synonym of *G. albo-bracteata.*

G. albo-bracteata (white-bracted). *fl.*, calyx white; corolla yellow; flower-stem terminating in a lax panicle, of which the axis, branches, bracts, and bracteoles are white. *l.* seven or eight to a stem, ovate-lanceolate, green, 4in. to 5in. long. Stems brownish-purple, 2½ft. high. Sumatra, 1882. SYNS. *G. alba* (R. H. 1837, p. 286, t. 20), *G. coccinea.*

G. coccinea is synonymous with *G. albo-bracteata.*

G. purpurea (purple). A synonym of *Mantisia saltatoria.*

GLOBE RANUNCULUS. *See* **Trollius.**

GLOBULARIA. SYN. *Abolaria.* *G. salicina* is the correct name of *G. longifolia.*

GLOBULEA. Included under **Crassula** (which *see*).

GLŒOSPORIUM. A genus of very destructive fungi, several members of which attack fruits like Apples, Almonds, Raspberries, Blackberries, Currants, Gooseberries, and Vines, while others affect Rhododendrons, Sycamores, &c. In all there are characteristic spots and pustules, which may be found upon either leaves or fruit, or upon both. At first they are usually brownish or reddish, but finally become black, which latter circumstance has given rise to the popular name of Anthracnose in the case, say, of *Glœosporium venetum*, found upon both Raspberries and Blackberries, and most destructive in America. Other well-known species are *G. fructigenum*, responsible for Apple Rot, or Ripe Rot; *G. ribis*, for the Currant Anthracnose of America, but occurring also in this country and upon the Continent; *G. ampelophagum*, for Black Rot of Grapes; *G. musarum*, for the well-known blackish spots upon the fruits of Bananas; *G. nervisequum*, for the Sycamore Blight of America; *G. rhododendri*, for the yellow blotches upon Rhododendrons, though not recorded from England. The pustules are in reality the fruits of the fungus; they appear separately, but often coalesce or become confluent.

Glœosporium—*continued.*

GLŒOSPORIUM AMPELOPHAGUM. *See* **Grape Rot** and **Vine Fungi.**

GLOMERULE. A head-like cyme.

GLORIOSA. According to J. G. Baker (in the "Flora of Tropical Africa"), this genus now includes five species. To those described on p. 74, Vol. II., the following should be added:

G. abyssinica (Abyssinian). *fl.* produced from the upper axils; perianth segments reflexed, not crisped, 2in. to 3in. long, ¾in. to 1in. broad; pedicels 3in. to 4in. long. *l.* oblong, acuminate, sometimes tendrilled at apex, 5in. to 6in. long, 1¼in. broad; upper ones alternate. Stem erect, 1½ft. to 2ft. long, simple or branched. Tropical Africa, 1894.

G. simplex (simple). The correct name of *G. virescens.*

GLORY OF THE SNOW. *See* **Chionodoxa.**

GLOSSANTHUS. A synonym of **Klugia** (which *see*).

GLOSSOPETALON (from *glossa*, a tongue, and *petalon*, a petal; in reference to the shape of the petals). ORD. *Celastrineæ.* A small genus (two or three species) of hardy, much-branched, very spiny, North American shrubs. Flowers white, sparse, axillary, shortly pedunculate; calyx deeply five-cleft; petals five, long tongue-shaped; stamens ten. Leaves alternate, spathulate, entire, small. *G. meionandrum* (R. G. 1894, p. 237, f. 52), the only species introduced, is described as a compact, much-branched, thorny shrub, with inconspicuous, whitish flowers, native of Colorado, &c. It thrives in any fairly good soil, and may be increased by cuttings.

GLOW-WORM (*Lampyris noctiluca*). A name applied to a species of British Beetle found occasionally in country gardens, and one which should be preserved. In this particular species the wingless female emits the brighter light; but the male also gives off a phosphorescent light; while even the egg, larva, and pupa are luminous. In some countries the reverse obtains, and the male is the chief light-bearer. It is thought that in the case of

FIG. 419. GROUP OF GLOXINIAS.

Glow-worm—*continued.*

the females the light is used as an attraction to the opposite sex; but the purpose of the greater brilliance of the males is not so readily determined. Some think that it is displayed simply as a form of rivalry amongst the male element. As perfect insects these Beetles do not appear to feed; but as larvæ they are very active, and feed upon various Mollusca, whose shells they enter and clear out the contents, afterwards cleansing themselves in the way suggested under **Insects**. Between the Glow-worm in the larval state and the wingless female there is little difference, and the former is often mistaken for the latter.

GLOXINERA (from *Gloxinia* and *Gesnera*, the parent plants). A very fine bigeneric hybrid. Brilliant is a very fine plant raised by Messrs. J. Veitch and Sons, between a Gesnera and Gloxinia Radiance. The flowers are of the usual size of the Gloxinia, horizontal in position, and of a rich carmine-crimson colour. The foliage is intermediate between the parents, and decidedly ornamental. (G. C. 1895, p. 144, f. 22.)

GLOXINIA. This genus now embraces about eighteen species. Calyx tube turbinate, adnate, the five lobes sub-equal, short or narrow; corolla tube straight or curved, cylindrical or enlarged above, the limb spreading, oblique or nearly equal, the lobes five, flat, rounded; stamens four, included; pedicels one-flowered. To the species and hybrids described on p. 76, Vol. II., the following should be added. *See also* **Isoloma, Nægelia,** and **Sinningia.**

G. insignis (remarkable). *fl.* bluish-lilac, blotched crimson at base of tube. Autumn and winter.

G. maculata insignis (remarkable). *fl.* lilac and crimson. 1864.

G. m. sceptrum (sceptre). *fl.* clear lilac, disposed in a large, rigid, terminal inflorescence. *l.* large, erect, cordate. Hybrid. The flowers are freely produced through the winter.

G. multiflora is synonymous with *Nægelia multiflora.*

G. Tapeinotes. This name has been given to a bigeneric hybrid between a spotted Gloxinia and *Sinningia barbata* (*Tapeinotes Carolina*). 1892.

G. tubiflora (tubular-flowered). A synonym of *Achimenes tubiflora.*

G. variabilis (variable). *fl.* white, spotted with violet-purple, large, inside of tube yellowish Greenhouse herb. 1877.

Varieties. AIGBURTH CRIMSON (Fig. 418), flowers large and of a brilliant crimson, one of the best of this colour, and very floriferous; CREOLE, throat dark maroon, shading to light blue at the margins; ELEANOR, throat pale sulphur-yellow, spotted with violet, a very pretty and distinct variety; HER MAJESTY, pure white flowers of great substance, freely borne on good healthy plants, probably the finest white; MERIMAC, flowers a deep crimson, with a narrow margin of pale carmine; MISS TUDOR, large, well-formed white flowers, freely spotted with rosy-red; MRS. AVORY, flowers pure white, with a distinct rosy margin, very pretty; MRS. NEAL, throat crimson-scarlet, with a white border spotted with rose; PRINCE OF WALES, a fine reddish-crimson flower of fine form; PRINCESS OF WALES, flowers snowy-white, margined with orange-crimson, very handsome; ROSE QUEEN, flowers a beautiful soft rose, self-coloured; ROSINA and TRILBY are both distinct, handsome, and heavily-spotted varieties, of which there are now many.

GLYCE. A synonym of **Kœniga** (which *see*).

GLYCINE. Soy. Including *Soja.* To the species described on p. 76, Vol. II., the following should be added. A number of plants formerly classed hereunder are now referred to **Amphicarpæa, Apios, Chætocalyx, Cologania, Fagelia, Hardenbergia, Kennedya, Sweetia, Turpinia, Wistaria,** &c.

G. Soja (Soja).* *fl.* violet, shortly pedicellate, disposed in small, axillary racemes. *fr.*, pods hispid-velvety, abundantly produced. *l.* trifoliolate; leaflets stalked, ovate-lanceolate. Stems erect, branched from the base. *h.* 1ft. to 3ft. Asia, 1790. Annual. SYNS. *Dolichos Soja, Soja hispida.*

GLYCINE (of Wight and Arnott). A synonym of **Teramnus** (which *see*).

GLYPHOSPERMUM (of G. Don). A synonym of **Gentiana** (which *see*).

GMELINA. Flowers large, in small or panicled cymes; calyx shortly five-toothed; corolla limb oblique, five- (or four-) lobed. To the species described on p. 77, Vol. II., the following should be added:

G. arborea (tree-like). The correct name of *G. Rheedii.*

G. Hystrix (spiny). *fl.* in short, dense, terminal, cone-like spikes, formed of large, reddish-purple bracts, and yellow, irregularly campanulate flowers 3in. long. *l.* elliptic, oblong, or lobed, 3in. long, cuneate or rhomboid at both ends, glaucous beneath; petioles 1in. long. India, 1894. A large, spiny, climbing shrub, with the habit of a Bougainvillæa. (B. M. 7391.)

GNAPHALIUM. To the species described on p. 77, Vol. II., the following should be added. Several species formerly included here are now referred to **Anaphalis, Antennaria, Helichrysum, Helipterum,** and **Leontopodium.**

G. Cunninghami (Cunningham's). A synonym of *G. japonicum.*

G. japonicum (Japanese). *l.* silvery, mucronate-acute; lower ones lanceolate, attenuated at base; upper ones sessile, linear. *h.* 1ft. A cosmopolitan annual, forming a very good foliage plant for edgings, especially on poor soils. The blossoms should not be allowed to expand. SYNS. *G. Cunninghami, G. lanatum.*

G. lanatum (woolly). A synonym of *G. japonicum.*

GNIDIA. To the species described on pp. 77-8, Vol. II., the following should be added:

G. juniperifolia (Juniper-leaved). *fl.* two to four in a head. June and July. *l.* sparse, lanceolate-linear, acute, coriaceous, ⅛in. to ¼in. long. Branches erect, twiggy, mostly with corymbose branchlets. *h.* 1ft. to 2½ft. South Africa, 1786. A variable species. SYN. *G. simplex* (B. M. 312).

G. simplex (simple). A synonym of *G. juniperifolia.*

GOAT MOTH (*Cossus ligniperda*). The caterpillars of this Moth (Fig. 420) are found in abundance in Apple and Pear trees, and most landscape and timber trees.

FIG. 420. GOAT MOTH.

Their depredations are well known; but there is considerable difficulty in reaching the larvæ, which remain several years as such before assuming the pupal state. Unlike some of the large insects—*Sirex gigas* for instance—which only attack weak and decaying trees, the Goat Moth deposits her eggs only upon the robust ones. In fact, should an infested tree die, the caterpillars will forsake it. The perfect insect is on the wing during late June and July, and rests during the day upon its food-plant, where it is well "protected," so well does its colour harmonise with the surroundings. The eggs are laid upon the food-plant, and pushed by means of the abdomen under the bark, and then secured by means of a viscid secretion. In the autumn the caterpillars may be found boring into the tree. When ready to become perfect insects the pupæ work out of their cocoons by means of the spines upon the abdomen, and towards the outlet of the galleries.

Fumigating bellows and sulphur may be employed to oust the caterpillars from their retreats, but the task of doing so is not easy. Many inject liquid insecticides into the galleries; paraffin is best. Wires may also be thrust into the holes, and the larvæ killed by this means.

During the time the insects are upon the wing the tree-trunks should be carefully searched, and any found

Goat Moth—*continued.*

destroyed. This may be most successfully done in the evening just before twilight.

One of the most important points in dealing with these pests is to carefully seal up the outlet-holes after the insects have been destroyed. This may be done with grafting-wax, and will prevent the trees from decaying.

GOAT'S THORN, GREAT. *See* **Astragalus Tragacantha.**

GOAT WILLOW. *See* **Salix Capræa.**

GODOYA. The correct name of *G. gemmiflora* [not *geminiflora*] is *Blastemanthus gemmiflorus.*

GOD'S EYE. *See* **Veronica Chamædrys.**

GOERIUS OLENS. *See* **Staphylinidæ.**

GOETHEA. This genus is closely allied to *Pavonia*, under which *G. semperflorens* is now classed.

GOLDBACHIA. A synonym of **Arundinella** (which *see*).

GOLDEN APPLE. *See* **Ægle** and **Spondias lutea.**

GOLDEN BALL. *See* **Trollius europæus.**

GOLDEN CHAFER, GREEN ROSECHAFER, or **ROSECHAFER** (*Cetonia aurata*). Popularly this elegant Beetle is associated only with the Rose, and not then as often regarded as a pest as it should be. Fruit-growers, however, know it as one of the most hurtful Beetles to the Strawberry and the Apple crops, feeding as it does upon the flowers, or rather upon the sexual organs. Nor does it confine its depredations to such, but it may be found upon numbers of flowers and ornamental trees. Where the Beetles are plentiful they are best taken in a collecting-net, and afterwards destroyed by means of boiling water. The larvæ when turned up with soil, or the very destructive cocoons enclosing the pupæ, should be similarly treated. *See* **Rosechafer.**

GOLDEN MAIDENHAIR. *See* **Polypodium vulgare** and **Nothochlæna.**

GOLDEN THISTLE. This name is also applied to **Protea Scolymus** (which *see*).

GOLDEN WILLOW. *See* **Salix alba vitellina.**

GOLD-TAIL MOTH. This is a near relative of the destructive Gipsy Moth and the **Brown-tail Moth**, referred to under that heading in the present volume; and also under **Liparis**, in Vol. II. For the best methods of dealing with it, *see* **Brown-tail Moth** and **Hawthorn Caterpillars.**

GOLDYLOCKS. *See also* **Aster Linosyris.**

GOLOWNINIA. A synonym of **Crawfurdia** (which *see*).

GOMBO. *See* **Hibiscus esculentus.**

GOMEZA (named in honour of Bernardino Gomez, a surgeon in the Portuguese Navy, who wrote on the plants of Brazil in 1803). ORD. *Orchideæ.* A genus embracing about half-a-dozen species of stove, epiphytal Orchids, natives of Brazil, with the habit of small Odontoglossums. Flowers pale yellow or greenish, inconspicuous but usually fragrant, produced in winter and early spring; lip affixed at the base of the column, continuous, incurved-erect or erect from the base, at length reflexed, spurless; column erect, semi-terete; raceme often many-flowered; scape axillary under the pseudo-bulb, simple. Leaves contracted to a rather broad petiole. The species introduced require similar culture to the Brazilian species of **Miltonia** (which *see*).

G. Barkeri (Barker's). *fl.* light yellowish-green, with some red spots on the lip and an orange line round the stigma; lateral sepals connate to the middle; scape loosely racemose, many-flowered. *l.* 5in. to 7in. long. Pseudo-bulbs 3in. to 4in. long, two-leaved. 1836. SYNS. *Odontoglossum Barkeri, Rodriguezia Barkeri* (B. M. 3497).

G. crispa (curled). *fl.* sea-green, bordered with yellow, Primrose-scented; sepals and petals undulate-crisped; raceme elongated. *l.* oblong-lanceolate, spreading, undulated. Pseudo-bulbs elongated, compressed, two-leaved. 1839. SYNS. *Odontoglossum crispatulum, Rodriguezia crispa* (B. R. 1840, t. 54).

Gomeza—*continued.*

G. foliosa (leafy).* *fl.* buff-yellow, very fragrant, ¾in. across; lateral sepals connate at base; lip reflexed, having two white keels on the disk; raceme longer than the leaves. *l.* linear, 6in. long. Pseudo-bulbs much compressed, 2in. to 3in. long, two-leaved. 1825. SYNS. *Odontoglossum foliosum, Pleurothallis foliosa* (B. M. 2746).

G. planifolia (flat-leaved). *fl.* light greenish-yellow, very fragrant; lateral sepals connate nearly to their tips; lip reflexed, with two oblong tubercles on the disk; raceme longer than the leaves. *l.* 4in. to 5in. long, recurved. Pseudo-bulbs about 2in. long, two-leaved. 1822. SYNS. *Odontoglossum planifolium, Rodriguezia planifolia* (B. M. 3504).

G. recurva (recurved). *fl.* light yellow, ¾in. across vertically; lateral sepals connate into an oblong blade deeply bifid at apex; lip having two short, raised plates at base; raceme as long as, or longer than, the leaves. *l.* 8in. to 12in. long. Pseudo-bulbs 2in. to 3in. long, two- or three-leaved. 1815. (B. M. 1748.) SYNS. *Odontoglossum recurvum, Rodriguezia recurva.*

GOMPHIA. According to the compilers of the "Index Kewensis," this genus includes *Walkera* and *Wolkensteinia*; but the species known under the former name are probably lost to cultivation.

G. gigantophylla (giant-leaved). The correct name of *G. Theophrasta. Wolkensteinia Theophrasta* (R. G. 1865, t. 471) is synonymous with this species.

GOMPHOCARPUS. *Anantherix* should, according to Bentham and Hooker, be included hereunder. To the species described on p. 79, Vol. II., the following should be added:

G. padifolius. According to the "Index Kewensis," this should be classed under *Xysmalobium.*

G. setosus (bristly). *fl.* greenish-yellow, glabrous; umbels numerous about the tips of the branches. *l.* linear, narrowed to the petioles, attenuated-acute at apex, pale green, highly glabrous, with revolute margins. Stems sub-shrubby; branchlets woolly. South Arabia, 1897. A small shrub, allied to *G. fruticosus.* (B. M. 7536.)

G. sinaicus (Mount Sinai). This is identical with the common *G. fruticosus.*

GOMUTUS. A synonym of **Arenga** (which *see*).

GONATANDRA. A synonym of **Campelia** (which *see*).

GONGORA. To the species described on p. 80, Vol. II., the following should be added:

G. aurantiaca (orange). *fl.* of a bright vermilion-orange, distantly arranged in nodding spikes, lasting a long time in perfection; scapes erect, about 1ft. high. Autumn and early spring. Colombia. A distinct, evergreen species. SYN. *Acropera aurantiaca* (B. M. 5501).

G. barbata (bearded).* *fl.* showy; sepals and petals olive-brown; lip convolute, forming a long tube, rosy-pink at base, white in front, bearing on the disk many rosy-pink protuberances; raceme two- to five-flowered; scape nodding. Summer. *l.* distichous, linear-lanceolate, almost white beneath. West Indies. (I. H. vii., t. 248.)

G. Charlesworthii (Charlesworth's). *fl.* nearly white, barred with very light brownish-purple; scape arching, about 1½ft. long, bearing about twenty flowers. *l.* plicate, 1ft. long, 2½in. broad. Habitat not recorded, 1893.

G. Charontis. *fl.*, sepals and petals yellow, spotted with brown; lip white, its apex and basilar wings rich yellowish, spotted with crimson, as is the white column; spike many-flowered, hairy. Pseudo-bulbs large, rounded. Colombia, 1877.

G. flaveola (yellowish). *fl.* light ochre-yellow, spotted brown, distant; lip with a sigmoid claw, and having a median bristle and very small basilar horns to the basal part (hypochil); peduncle angulate, bearing a rich raceme. 1886.

G. galeata (hooded).* *fl.* strongly scented like Wallflowers; sepals and petals pale tawny-yellow; lip brownish-red; racemes drooping, freely produced, the ovaries curving inwards. Summer. Pseudo-bulbs ovate, clustered. Mexico, 1828. SYNS. *G. Loddigesii, Acropera Loddigesii* (B. M. 3563), *Maxillaria galeata* (L. B. C. 1645).

G. g. purpurea (purple). *fl.*, sepals dark purple; petals deep yellow; lip dotted with black. 1890.

G. gratulabunda (congratulating). *fl.* yellow, profusely dotted with dull red; sepals revolute-margined, the dorsal one erect, the lateral ones reflexed; raceme loosely many-flowered. *l.* oblanceolate, caudate-acuminate. Pseudo-bulbs oblong, strongly and acutely ribbed. Colombia, 1857. (B. M. 7224; R. X. O. ii., p. 169, t. 170, f. 3.)

G. grossa. *fl.* whitish or yellowish, numerously spotted with dark purple. Ecuador. Allied to *G. atropurpurea*, from which it differs in having a tooth inside and a small terete acuminate body between the horns, and a broader and stouter lip.

G. Jenischii (Jenisch's). A synonym of *G. odoratissima.*

G. Loddigesii (Loddiges'). A synonym of *G. galeata.*

Gongora—*continued.*

G. macrantha (large-flowered). A synonym of *Coryanthes macrantha.*

G. maculata alba (white). *fl.* wholly white, except some pink spots on the lip. May. Pseudo-bulbs more deeply ribbed than in the type. This variety is also known as *grandiflora.*

G. m. tricolor (three-coloured). A synonym of *G. tricolor.*

G. odoratissima (highly odorous). *fl.* clear yellow, mottled and blotched reddish-brown; upper sepal and petals adherent to the back and sides of the curved column, while the lip is continuous with its base, clawed, the basal part (hypochil) arched and laterally compressed, with a pair of petaloid processes on the back; the upper part (epichil) acutely elongate-ovate, the sides folded face to face; racemes drooping. *l.* broadly lanceolate. Venezuela. (F. d. S. 229.) SYN. *G. Jenischii.*

G. portentosa rosea (pink). *fl.*, sepals and petals bright rose-purple, with small, purplish spots; lip citron-yellow and brown, large and thick. United States of Colombia, 1896. A pretty variety. (L. 508.)

G. Sanderiana (Sander's). *fl.* yellowish, with rose-coloured spots, disposed about six in a raceme. *l.* 10in. long, 2in. broad. Pseudo-bulbs conical, 5in. long. Peru, 1896. Allied to *G. portentosa.*

G. tricolor (three-coloured). *fl.*, sepals deep, bright yellow, blotched sienna-brown, the dorsal one lanceolate, affixed halfway up the back of the column, the lateral ones obliquely triangular; petals pale yellow, lightly spotted, small; hypochil white, oblong, convex, two-horned at base, the epichil stained on the sides with cinnamon; racemes stout, drooping. Pseudo-bulbs thickly ribbed. Panama or Peru. (B. R. 1847, t. 69, under name of *G. maculata tricolor.*)

G. truncata (truncate). *fl.* whitish or straw-coloured, freckled brownish-purple; dorsal sepal obovate, carinate, the lateral ones roundish-oblong, very blunt; petals small; lip clear yellow, curved, the hypochil compressed in the middle and bearing two awns in front, the epichil ovate, channelled; pedicels mottled purple. Mexico. (B. R. 1845, t. 56.)

G. quinquenervis and *G. scaphephorus* are also in cultivation at Kew.

GONIOSCYPHA (from *gonia*, an angle, and *skyphe*, a cup; in allusion to the angled, cup-like perianth). ORD. *Liliaceæ.* A monotypic genus. The species is a stove perennial, of striking appearance. It requires similar culture to **Eucharis** (which *see*).

G. eucomoides (Eucomis-like). *fl.*, perianth dull green, campanulate, with six sub-orbicular, very obtuse lobes; scape simple, leafless, bearing a dense, cylindrical spike of flowers, surmounted by a crown of fine, subulate bracts, similar bracts being mixed with the flowers. *l.* in a rosette, elliptic, acute, 1ft. long, 4in. to 5in. broad. Rootstock short, fleshy. Bhotan, 1886. (G. C. 1886, xxvi., p. 744; J. L. S. xiv., p. 581, t. 19.)

GONOCALYX. This monotypic genus is closely allied to *Ceratostemma*, under which it should perhaps be included.

GONOGONA. A synonym of **Goodyera** (which *see*).

GONOLOBUS. *G. hispidus* should be classed hereunder, and not under *Fischeria. See also* **Fischeria, Lachnostoma,** and **Marsdenia,** under which genera several species formerly included under *Gonolobus* are now classed.

GOODENOVIA. A synonym of **Goodenia** (which *see*).

GOODYERA. SYN. *Gonogona.* The species are found in Europe, Madeira, tropical and temperate Asia, and (according to Reichenbach) New Caledonia and the Mascarene Islands. To those described on p. 81, Vol. II., the following should be added. A few plants formerly included here are now referred to **Hæmaria.**

G. discolor is now classed under *Hæmaria.*

G. japonica (Japanese). *l.* stout, oblong-ovate, velvety-green, tinged with olive-brown; midrib broadly striped with silvery-white, suffused when young with rosy-pink. Japanese gardens.

G. macrantha luteo-marginata (yellow-margined). *l.* distinctly margined with a band of creamy-yellow. Japan. Greenhouse. (F. d. S. 1779-80; F. & P. 1867, p. 227; G. C. 1867, p. 1022; R. G. 533, f. 2.)

G. macrophylla (large leaved). *fl.* white, hairy outside. *l.* large. Madeira, 1880.

G. Rodigasiana (Rodigas'). *l.* thick, ovate-lanceolate, acute, velvety, pale green, silvery in the middle; sheaths very shortly attenuated. Papua, 1886. Stove. (I. H. 1886, 616.)

G. Rollissoni (Rollisson's). *l.* rich, dark green, margined, striped, and blotched with pale yellow on the upper surface, rich velvety-purple beneath. Native country unknown. A beautiful, stove species.

G. tessellata (tessellated). A synonym of *G. pubescens minor.*

G. Menziesii, G. procera, and *G. reticulata* are also in cultivation at Kew.

GOOSEBERRY. There is little to add to the information given in Vol. II. The importance of good drainage cannot well be over-estimated. If this be at all defective, the growth is stunted, the fruit is small, and the bushes are soon covered with moss, which is undesirable, as it affords shelter to many of the worst kind of pests. The soil should also be loosened where the bushes are to be planted. If heavy and tenacious, burnt refuse, road-scrapings, or strawy manure should be worked in to render it more porous. On the other hand, if light and sandy, marl or clay may be beneficially employed. If, too, animal manures are used when the bushes are bearing, great assistance will be given. Planting is best done from the middle of October to the end of November, and in dry weather.

Pruning is an important operation, and should be done immediately after the fruit is ripe; then the cultivator is better able to see where the congested growth is situate. Where, however, birds are a nuisance, it will be advisable to defer pruning until spring, otherwise the buds will be taken, and the crop suffer in consequence.

Insects, &c. To the list of destructive pests enumerated on p. 83, Vol. II., several others should be added—**Gooseberry Mite** (*Bryobia pretiosa*), **Gooseberry and Currant Scale** (*Lecanium ribis*), **Winter Moth** (*Cheimatobia brumata*), **Otiorhynchus picipes, Dot Moth** (*Mamestra persicariæ*), which *see*, and **Gooseberry Mildew.** The majority of these are of sufficient importance to receive treatment under their respective headings.

Sorts. Following the plan of the work, we have placed the new varieties of merit in their respective classes, based upon the colour of the fruits. Those marked F are specially recommended for flavour, and those marked S for size.

Class I. Fruit with Red Skin.

Companion (F). Fruit light red, hairy. Habit rather spreading.

Forester (S, F). Fruit bright red, hairy, very early. Branches erect. An abundant cropper.

Lancashire Lad (S, F). Fruit dark red, hairy, early. A favourite market variety.

Speedwell (S, F). Fruit pale red, hairy, early. Branches strong and erect. An abundant bearer.

Whinham's Industry (F). Fruit deep red, medium to large, hairy. A valuable variety for market, being early and a great bearer, with branches erect.

Class II. Fruit with Yellow Skin.

Diamond (S, F). Fruit yellow. Branches partly erect. A good bearer.

Golden Gem (S, F). Fruit bright yellow, late. Branches erect. An abundant bearer.

Gunner (S, F). Fruit dark yellow. Branches erect. A great bearer.

Class III. Fruit with Green Skin.

Angler (F). Fruit deep green, medium, early. Branches erect. A profuse bearer.

Fearless (S, F). Fruit bright green. Branches somewhat spreading.

Lofty. Fruit deep green, hairy, medium to large. Branches spreading. A good bearer.

Class IV. Fruit with White Skin.

Duchess of Sutherland (F). Fruit white, oval, medium size, good flavour. Branches spreading. A moderate bearer.

Sheba Queen (F). Fruit white, medium. Branches erect. Good cropper.

GOOSEBERRY AND CURRANT SAWFLIES (*Nematus ribesii* and *N. consobrinus*). Popularly there is supposed to be but one representative of this family infesting Currants, the latter insect frequently being overlooked. This may be accounted for chiefly by the two insects approaching one another so closely in general appearance as larvæ, though *consobrinus* is smaller than the better-known *ribesii*, and is found later. When full-fed the caterpillar is a bright green, except the first and the last segments, which are yellowish, the black processes (tubercles) which characterise the young larvæ being absent.

To the remedies suggested in Vol. II. may be added: Paris Green (1oz. to 20 gallons of water), carefully sprayed

Gooseberry and Currant Sawflies—*continued.*

on. The Sawfly larvæ are chewing insects, and are therefore best dealt with through their food-plants. As a preventive, and in addition to the remedies suggested, the old soil about the bushes should be replaced by new, the former being deeply buried or burnt.

GOOSEBERRY CLUSTER CUPS. This is a well-marked fungus found upon Gooseberries, and is the Æcidium-stage of *Puccinia Pringsheimiana*. *See* **Gooseberry Fungi.**

GOOSEBERRY FUNGI. Of recent years several species of Fungi have proved troublesome to the Gooseberry cultivator. The more important are Gooseberry Cluster Cups, Gooseberry Mildew, the Wound Fungus *Plowrightia ribesia*, and a species of *Polyporus*, which is sometimes found upon the stems of both Gooseberries and Currants: it is an ally of the Tinder Fungus (*Fomes fomentarius*).

Gooseberry Cluster Cups is but a stage in the life-history of *Puccinia Pringsheimiana*, found upon certain species of *Carex*. The disease is one which is far more prevalent than it was a few years ago, and seems to be spreading. Wet weather is favourable to its development. The Cluster Cups are found upon orange-red patches, and when mature are filled with similarly-coloured spores. When viewed under the compound microscope, the Cluster Cups will be seen to have cut edges. They are found in late spring, and where Gooseberries are largely cultivated the disease may prove very injurious. When once attacked there is no known cure; on preventive measures should the gardener rely. These may consist in removing and burning the infested berries and leaves, and spraying with Bordeaux Mixture early in the next season. The disease, however, is one readily disseminated if the sedges on which the teleutospores are produced remain undiscovered.

Of Gooseberry Mildew there are two distinct kinds, one of which, *Sphærotheca mors-Uvæ*, is very destructive in the United States. This attacks both leaves and young fruits, enveloping them with a cobweb-like mildew, and finally with a fine white powder. The leaves "yellow" and die, and the fruits fail to grow. In the United States many fungicides have been employed, but none so effectively as potassium sulphide (1oz. to 3 gallons of water). The first application should be made just as the buds are bursting, and two others should follow at intervals of eleven days. This treatment Mr. Close, of the New York Agricultural Experiment Station, found eminently satisfactory.

The other species of Gooseberry Mildew (*Microsphæra grossulariæ*) is common in this country, but is confined to the foliage, which is covered with a whitish powder. The treatment recommended for *Sphærotheca mors-Uvæ* will be equally suited to this.

Plowrightia (*Scleroderris*) *ribesia* is not confined to Gooseberries, but may also be found upon both Black and Red Currants. It is a Wound Fungus, characterised by black crusts, or stroma, which burst through the bark. To Mr. Massee, of Kew, belongs the credit of determining its parasitic nature, for even as recently as Professor Smith's translation of Tubœnf's work it is described as "a common species on twigs of Red and Black Currant, but whether parasitic or not is unknown." Mr. Massee also publishes in the "Gardeners' Chronicle" an excellent drawing of the Fungus on both Currant and Gooseberry, showing the large black warts on the stems, and also a section through a Fungus illustrating the flask-shaped perithecia which are produced later.

Polyporus ribis is found on the Gooseberry and its allies the Black and the Red Currant, but only on old and practically worthless trees, which should be dug up and burned. *See* **Polyporus,** Vol. III.

GOOSEBERRY MILDEW. *See* **Gooseberry Fungi.**

GOOSEBERRY MITE (*Bryobia pretiosa*). A very common pest, but one frequently mistaken for Red Spider. It swarms upon both Gooseberries and Currants, and is most troublesome in very dry seasons, and especially in those gardens where Ivy is grown as a wall-plant. Like Mites generally, this Bryobia has eight legs when mature, but the front pair on the members of this genus are of unusual length. The Mites in colour vary from

Gooseberry Mite—*continued.*

bright red to reddish-brown. They appear in early spring, and cause the young foliage to present a sickly appearance, and eventually to be shed prematurely. They cluster upon the under-surface of the leaves, and spin a web, but during bright weather may be found upon the upper surfaces. The best remedy to apply is weak Kerosene Emulsion.

GOOSEBERRY OR MAGPIE MOTH (*Abraxas grossulariata*). This conspicuously-coloured Moth, and its

FIG. 421. GOOSEBERRY MOTH, LARVA, AND PUPA.

larva and pupa (Fig. 421) are not likely to be mistaken for anything else. Though the caterpillars feed for a time in late summer, yet it is after hibernating that they are most destructive to Currants and Gooseberries. So conspicuous, however, are the larvæ that where only small gardens are concerned hand-picking should suffice. In other cases the remedies suggested for Gooseberry and Currant Sawflies will answer, combined with keeping the trees free from dead leaves and the ground beneath from rubbish.

GOOSEBERRY SCALE (*Lecanium ribis*). This is a red-brown Scale occurring in sufficient numbers upon Currants and Gooseberries to be constituted a pest, though at present not widely dispersed. The insects are double-brooded, the eggs of the later brood not hatching out until early spring of the following season. As it is practically useless to attempt to deal with Scale except when the larvæ are on the move, the cultivator should periodically examine his bushes. Once the "Scale" has hardened, nothing short of removal by means of a stiff brush will suffice. Weak Kerosene Emulsion, however, if sprayed on when the larvæ are moving freely, will destroy large numbers; while hot water of 140deg. Fahr. will also effectually oust the pests at the stage named.

GORDONIA includes *Lacathea*, tho correct name of *L. florida* being *G. pubescens.*

GORTERIA (named in honour of David Gorter, a Dutch botanist and author of a "Flora Belgica"). SYN. *Personaria.* ORD. *Compositæ.* A small genus (four species) of half-hardy, diffuse, South African annuals, allied to *Gazania*. *G. personata* has been introduced, but is probably no longer grown in this country. One or two species formerly included here are now referred to **Gazania.** *G. acaulis* is a garden name for *Haplocarpha Leichtlinii.*

GORTERIA (of La Marck). A synonym of **Berkheya** (which *see*).

GOSSYPIUM. The species are distributed over the tropics of the Old and New Worlds. To those described on p. 85, Vol. II., the following should be added:

G. arboreum (tree-like). *fl.* purple, rarely white; petals spreading. July. *l.* nearly glabrous, deeply palmately five- to seven-lobed; lobes linear-oblong, mucronate. Plains of India, 1694. A stove shrub or low tree, rarely herbaceous.

G. Comesii (Comes'). *fl.* yellow, with a blood-red spot at the base of the petals. *l.* three- to five-lobed. 1889. Probably a variety of *G. herbaceum.* SYN. *G. indicum Comesii.*

G. indicum (Indian). A synonym of *G. herbaceum.*

G. Kirkii (Kirk's). *fl.* yellow-eyed; peduncles articulated in the middle. *l.* stellate-pilose above, glandular-velvety below, broadly ovate, acute, cordate at base, palmately five-lobed; petioles longer than the leaves. Eastern tropical Africa, 1881.

GOTHIC MOTH. *See* **Vine Moths.**

GOTHOFREDA. A synonym of **Oxypetalum** (which *see*).

GOUFFEIA. Included under **Arenaria** (which *see*).

GOUGHIA. A synonym of **Daphniphyllum** (which *see*).

GOUTY GERANIUM. *See* **Pelargonium gibbosum.**

GOVENIA. SYN. *Eucnemis.* To the species described on p. 87, Vol. II., the following should be added:

G. sulphurea (sulphur). *fl.* rather large; sepals light sulphur, the lateral ones rather broader than the cuneate-lanceolate upper one; petals white on the disk, sulphur on the margin, with numerous broken, purple lines; lip white, spotted dark brown at apex, cordate-oblong. *l.* scarcely 2in. broad, cuneate-lanceolate, acuminate. Pseudo-bulbs Onion-like. Paraguay, 1885. A curious species.

GOVINDOVIA. A synonym of **Tropidia** (which *see*).

GRACILARIA SYRINGELLA. *See* **Syringa —Insects.**

GRADERIA (probably an anagram on *Gerardia*, the name of an allied genus). SYN. *Bopusia.* ORD. *Scrophularineæ.* A small genus (two or three species) of many-stemmed, warm greenhouse herbs, natives of South Africa. Flowers sub-sessile; calyx five-cleft; corolla tube inserted, much enlarged, the limb of five broad, sub-equal, spreading lobes; stamens four, included. Leaves opposite or the upper ones alternate, ovate-lanceolate, entire, or cuneately three- to five-cleft or pinnatifid. Only one species calls for description here. It is probably semi-parasitic.

G. subintegra (almost entire). *fl.* rosy-lilac, Gloxinia-like, in leafy, erect racemes. *l.* ovate-elliptic, acute, hairy. Branches trailing; rootstock woody. Transvaal, 1894. (G. C. 1893, xiv., p. 798, *f.* 122.)

GRAFTING WAX. Apart from the use to which this substance is usually applied, it may be successfully employed for stopping holes or covering wounds in trees. Painter's "knotting" will be found an excellent substitute for Grafting Wax as ordinarily employed. It is easily applied, and quickly forms a coat impervious to weather.

GRAIN. The seeds of plants of the order *Gramineæ*; popularly, any small seeds.

GRAMINCA. A synonym of **Cuscuta** (which *see*).

GRAMMANGIS. These are best grown in baskets suspended near the roof-glass in the stove or East Indian house, and in a position where they can obtain the maximum amount of available light. Only sufficient shade is required to prevent the sun's rays from scorching the foliage. The potting compost should consist of good fibrous peat and living sphagnum—two parts of the former to one of the latter. To this may be added a liberal sprinkling of finely-broken crocks. The compost should be pressed moderately firm about the roots and base of the plant. The drainage should be clean and ample.

The best time at which to repot is when the new roots are being emitted from the base of the last-made growth. The plants require a liberal supply of water during the growing season. After the growths are matured, only sufficient moisture is required to maintain a plump condition of the bulbs and foliage.

GRAMMANTHES. *G. gentianoides* is now the correct name of *G. chloræflora.*

GRAMMATOPHYLLUM. SYNS. *Gabertia, Pattonia.* Flowers showy, on long pedicels; sepals and petals sub-equal, free, spreading; lip affixed above the base of the column, erect, concave, the lateral lobes rather broad, erect, loosely embracing the column, the middle one short, recurved-spreading, narrow or dilated; column erect, rather shorter than the lip; raceme loosely many-flowered; scape long, simple. Leaves distichous, often very long.

The flowering of the remarkable *G. speciosum* (the giant of its race) in the collection of Sir T. Lawrence, at Burford, Dorking, in 1897, has been one of the most interesting events in the Orchid World. Only on four previous occasions had it flowered in Europe, viz., in

Grammatophyllum—*continued.*

Messrs. Loddiges' Nursery, at Hackney, in 1852; in the collection of Sir G. Taunton, at Leigh Park; in the collection of Mr. W. G. Farmer, Nonsuch Park, Ewell; and imperfectly in the collection of the late Mr. John Day, at Totterham.

To illustrate the gigantic proportions attained by this species in its native country, Mr. J. H. Veitch, in his "A Traveller's Notes," speaks of one in the Botanic Gardens at Penang as being 42½ft. in circumference, its shoots from 6ft. to 7ft. long, and its seed-pods 7½in. long (including their foot-stalks) and 2½in. in diameter. One of the last year's racemes, of which there were thirty, was 7½ft. long. Mr. Veitch also added that the plant was in fine condition, nearly all the shoots being clothed with foliage of a good colour.

The same writer also gives particulars of a plant of more gigantic proportions in the Botanic Gardens at Butenzorg, Java. This had forty-six racemes of flowers, some with twenty-four open blossoms and many more buds to expand. The plant was 15ft. through, and had stems 9ft. long.

It will be gathered from these particulars that to cultivate this species a house of considerable proportions will be required to accommodate it. It grows satisfactorily under the same conditions as that afforded to stove plants generally. It should be placed in a position where it can obtain all the available light, only shading to prevent actual scorching of the leaves. It requires a liberal supply of moisture both at the root and in the atmosphere during the growing season, with more dryer conditions during the period of rest. It is an interesting and wonderful plant where ample accommodation is available.

To the species described on p. 92, Vol. II., the following should be added:

G. elegans (elegant).* *fl.* showy, six or seven on an erect peduncle 1ft. high; sepals sepia-brown, with ochre-yellow margins, oblong; petals the same colour, narrower; lip yellow, with brown markings in front and a hairy disk, trifid, the front lobe wedge-shaped and emarginate; column white, with a pair of brown lines below the stigma. *l.* elongated, distichous. Pseudo-bulbs rather large, oblong. South Sea Islands, 1883.

G. Ellisii (Ellis's). A synonym of *Grammangis Ellisii.*

G. Fenzlianum (Fenzl's). *fl.* 2½in. in diameter, somewhat distant; sepals and petals pale yellowish-green, spotted with brown, the petals narrower and reflexed; lip yellowish, obliquely striped with brown, the mid-lobe reflexed, while between the side lobes is a channelled, white plate; scapes 3ft. to 4ft. long, many-flowered. *l.* 1ft. to 1½ft. long, oblong or lanceolate-oblong. Stems pseudo-bulbous, 4in. to 6in. long. Amboyna.

G. F. Measuresianum (Measures'). A synonym of *G. Rumphianum Measuresianum.*

G. Gulielmi II. (William II.). A synonym of *G. Rumphianum.*

G. Measuresianum (Measures'). A form of *G. Rumphianum.*

G. pantherinum (panther-like). *fl.* as large as those of *Cymbidium eburneum*, "spotted with dark blotches"; sepals and petals narrow cuneate-oblong, obtuse; lip cordate at base, trifid, with triangular segments, totally naked, "without any lines of hairs or velvet"; middle segment acute. New Guinea, 1878.

G. Rœmplerianum (Rœmpler's). A synonym of *Eulophiella Peetersiana.*

G. Rumphianum (Rumphius'). *fl.* erecto-patent, twenty-five to thirty on a scape; sepals and petals pale yellowish-green, blotched with brown; lip yellowish-white, lined with dark violet, pilose inside, three-lobed. *l.* lanceolate-oblong, 1ft. or more in length. Pseudo-bulbs tufted, oblong-conical, 9in. long when fully grown. Moluccas. (B. M. 7507.) SYN. *G. Gulielmi II.*

G. R. Measuresianum (Measures').* *fl.*, sepals and petals emerald-green, blotched and spotted with dark brownish-purple; side lobes of lip light yellow with oblique brown lines, the front lobe white with three brown lines at apex. Philippine Islands, 1889. SYNS. *G. Fenzlianum Measuresianum, G. Seegerianum* (of gardens).

G. Sanderianum (Sander's). A clerical error in a gardening periodical, the plant intended being *G. speciosum.*

G. scriptum (marked). *fl.*, sepals and petals yellow and red-spotted, equal, spreading, oblong, obtuse; lip lined with pale purple; raceme many-flowered; scape very long, rising from the base of the pseudo-bulb. *l.* lanceolate, three-nerved. Pseudo-bulbs transversely articulated, deeply ribbed. Moluccas.

G. Seegerianum (Seeger's). A garden name for *G. Rumphianum Measuresianum.*

GRAMMICA. A synonym of **Cuscuta** (which *see*).

GRAMMITIS CETERACH. A synonym of **Asplenium bulbiferum** (which *see*).

GRANGERIA (named in honour of N. Granger, a traveller in Egypt and Persia). ORD. *Rosaceæ*. A small genus (three species) of small, stove trees, natives of Madagascar and Mauritius, and scarcely distinct from *Moquilea*. *G. borbonica* (SYN. *G. buxifolia*) has been introduced, but is of no horticultural value.

GRAPE ANTHRACNOSE. *See* **Grape Rot.**

GRAPE FLOWER VINE. *See* **Wistaria.**

GRAPE OR VINE LOUSE (*Phylloxera vastatrix*). By way of a preventive measure against this pest, some interesting experiments have been conducted in France in connection with Vine cuttings, and it is simplicity itself. According to the "Revue Horticole," both the insect and its eggs may be destroyed by placing the Vine shoots intended for propagation purposes in water having a temperature of from 40deg. to 50deg. Cent. (104deg. to 122deg. Fahr.). It has been found that the shoots may be kept for ten minutes in water of that temperature, or for five minutes in water at 53deg. Cent. This precautionary measure is recommended for all purchased Vines before planting them.

In the principal wine-growing districts, grafting upon American stocks, as suggested in Vol. II., has proved very successful.

An insecticide which has been employed with more or less success for the root-feeding insects is bisulphide of carbon, a most inflammable preparation, and one needing the greatest care in its application. The liquid is injected into the soil with a special kind of syringe made by Vermorel. About one-third of an ounce is required for every square yard, the preparation penetrating the soil to a depth of from 4in. to 6in. in the case of an average soil, and deeper in heavy ones. No injury to the roots is caused if the bisulphide of carbon be used when the Vines are at rest. Several applications may be necessary, as, though fatal in the case of the perfect insects, the eggs are unaffected.

GRAPE ROT, or **BIRD'S-EYE ROT** (*Glœosporium ampelophagum*). This very distinctive disease is often most destructive upon the Continent of Europe, as well as in America, and it is not altogether unknown here. In America it is called Grape Anthracnose, and is sometimes known scientifically as *Sphaceloma ampelinum*. Leaves, shoots, and fruits are all involved, and the spots characteristic of the disease usually manifest themselves in late spring. The spots on the fruit are remarkable, being circular or somewhat irregular as to form, greyish, with brown margins, and surrounded by a vermilion-red ring. This combination has given rise to the popular name of Bird's-Eye Rot.

Unless efforts are made to control the disease, it spreads very quickly, involving the loss of the crop. Equal parts flowers of sulphur and lime have been found useful. This is all that may be done with safety while the Vines are active. When at rest, washing them with iron sulphate 6lb. and water 14gals. has been found most effectual in those countries in which the disease is most prevalent.

Other diseases of Grapes will be found under **Black Rot of Vines** and **Vine Fungi** in the present volume, and in Vol. IV. under the latter heading.

GRAPHOLITHA BOTRANA. *See* **Vine Moths.**

GRAPTOPHYLLUM. To the species described on p. 94, Vol. II., the following should be added:

G. pictum (painted). A synonym of *G. hortense*. The name *G. picturatum* has been given to a large-leaved form of this well-known species. 1895.

GRASSES FOR LAWNS. All the leading seedsmen sell mixtures of Lawn Grass seed suited to either heavy or light soils, as well as for town gardens. The following Grasses for Lawns are recommended by Messrs. Sutton and Sons, Reading: *Cynosurus cristatus* is especially advised for all soils, as it will thrive almost everywhere; *Festuca duriuscula* is excellent on all soils except wet ones; *Festuca ovina tenuifolia* is indispensable on all soils; *Festuca rubra* is one of the best Grasses for dry soil; *Lolium perenne Suttoni* is not so coarse as other varieties of Rye Grass, and is first-rate for covering the soil rapidly; *Poa pratensis* is useful for light, rich soils, and *Poa trivialis*

Grasses for Lawns—*continued.*

succeeds best in moist situations—it is one of the best Grasses for sowing under trees; *Poa nemoralis sempervirens* is one of the prettiest and best Lawn Grasses, and will grow almost anywhere. All Lawn Grass seeds should be sown thickly, and protected from birds by netting until they have well germinated. Four bushels of seed per acre is considered a fair quantity.

GRASS MOTH. *See* **Antler Moth.**

GRASS OF PARNASSUS. *See* **Parnassia palustris.**

GRASS-TREE, or **GRASS GUM-TREE.** *See* **Xanthorrhœa.**

GRATIOLA. Calyx five-parted, with the segments imbricated; pedicels axillary, solitary; stamens two, included.

G. tetragona (four-angled). A synonym of *Stemodia lobelioides*.

GRAVEL. This differs considerably in textare, some binding and making a firm walk in all weathers, while others absolutely refuse to bind in dry weather. In making new walks it is desirable to procure Gravel from such sources as are known to set firm in all seasons. Gravel may be kept very bright and clean in appearance by means of any of the weed-killers on the market, applied in April or May, and when the weather is dry. If the makers' directions are followed out, no weeds will be seen for the rest of the year.

GRAVEL WALKS. *See* **Walks.**

GRAYIA (in honour of Dr. Asa Gray, a celebrated American botanist, for many years Professor of Botany at Harvard University). ORD. *Chenopodiaceæ*. A small genus (two species) of rigid, erect, branched, hardy shrubs, closely allied to *Atriplex*, natives of North-west America. Male flowers minute, glomerate, axillary, pedicellate; females racemose. Fruit large for the size of the plant, pendulous. Leaves alternate, sessile, linear, obovate, or spathulate, obtuse, entire, rather fleshy. Only one species has been introduced. It is a small bush, thriving in any fairly rich soil, and may be increased by seeds or by cuttings.

G. polygaloides (Milkwort-like). *fr.* rose-coloured, compressed; calyx (in fruit) nearly ½in. long. *l.* six to ten lines long, ascending, oblong-lanceolate or obovate, cuneate at base. Stem erect; branches ascending or divaricate, spiny at apex. California, 1894. SYN. *G. spinosa*.

G. spinosa (spiny). A synonym of *G. polygaloides*.

GREASE-BANDING. A method of encircling tree-trunks with bands covered with a sticky substance, to prevent wingless females of Moths from reaching the upper portion for purposes of egg-laying. *See* **Winter Moths.**

GREAT OXEYE. *See* **Pyrethrum uliginosum.**

GREAT SPEARWORT. *See* **Ranunculus Lingua.**

GREAT TORTOISESHELL. *See* **Vanessa.**

GREEK VALERIAN. *See* **Polymonium cæruleum.**

GREEN CHAFER. *See* **Rosechafer,** Vol. III.

GREENHOUSE. As this structure should be as light and airy as possible, it is best to employ plenty of iron-work, having no large heavy wooden rafters or sash-bars to obstruct the light. This mode of construction is expensive at first, but will be found cheaper and more durable than wood in the end. When wood is used, teak will be found most serviceable.

The house should only be of moderate height—about 12ft.—and have a lantern about 2ft. wide, rising 2½ft. higher at the top, making the actual height in the centre 14½ft. The width may vary according to convenience, but 16ft. will be suitable. There should be shelves 3ft. wide at the sides, 2½ft. paths on each side, and a central bed 5ft. wide. The height of the sides may be 6ft., half being glass, resting on a wall 3ft. from the ground.

The side shelves or stages should come to within 6in. of the top of the wall. They are best made of slate with a few holes bored in about 18in. apart, and having a raised rim all round the edge. These should be filled with well-washed small gravel stones. Wooden shelves are not to

Greenhouse—*continued.*

be recommended; they soon decay if not well looked after, and in so doing make harbouring places for all manner of insect and fungus pests, which are most injurious to plants. Shelves or stages made of wooden battens, with spaces in between, should never be used, as they allow water to run away at once, and by permitting dry air to come from *below*, and to circulate freely amongst the pots, cause too rapid evaporation. Thus in hot weather constant watering will be necessary, or the plants must be stood in saucers, which is not advisable, as in that case the water does not run away at all, and the pot is liable to become water-logged, causing the soil to sour. In the case of slate covered with loose gravel stones, the stones allow water to run freely from the pot, but yet retain it; thus continual evaporation takes place, and the air passes up amongst the foliage of the plants laden with moisture. This is especially the case when they are damped two or three times a day.

In the centre of the house it is usual to have shelves placed in tiers one above the other. These should also be made of slate and covered with gravel stones; but it is a better plan to have a flat bed raised 6in. above the ground. In the centre of this tall plants in tubs or large pots may be placed; or they may even be planted out, and then others not quite so tall arranged next them, the plants getting lower towards the edge. This bed should also be covered with loose gravel. The paths should either be tiled or cemented over.

The temperature of this house should range from 50deg. to 60deg. In all cases it should be at least 5deg. lower in the night than in the day, both in this and the growing-houses.

When the soil is very heavy and wet, the ground on which the Greenhouse is to stand should be raised above the rest, so as to ensure perfect drainage. The growing-pits will also, in such cases, be better raised instead of sunk.

THE GROWING-HOUSES. Of these there should be at least two: one structure may be divided into two parts, and sometimes three divisions may be made. The sunk house or pit is best, as, not being so exposed, the heat is more easily retained. This is a house having a low exterior wall about 1ft. high on which the roof rests, coming down nearly to the level of the ground. It is entered by an exterior flight of steps, the path in the centre being 3½ft. below the level of the ground; side shelves are fitted similar to those in the Greenhouse, but they may be wider. The two divisions should be warm and cool respectively, the first having a winter temperature ranging from 55deg. to 65deg., and the second from 45deg. to 55deg. In summer artificial heat will not be necessary in the cool end, and in the warm one only during very damp weather, or for the purposes of propagation, when a little bottom-heat may be required. The warm pit may be used for growing plants on, and for bringing them into blossom quickly, or for gentle forcing in the spring. The cool pit will serve for hardening off plants in blossom before shifting to the Greenhouse, as well as young ones that are intended to grow outside in the summer; it can also be used as a resting pit. Both the pits can be used for propagation.

It is a good plan in the case of these houses to make sections of the roof to lift on hinges, so that when the weather is suitable they can easily be propped open and the plants shifted without passing up and down through the doors.

FRAMES. It is very convenient to have a few of these, and it is surprising what a number of plants may be grown in them with the aid of a little heat. They should vary in depth, so as to admit of different-sized plants being grown in them, are best built of brick with wooden lights, and should face to the south.

ASPECT. Both the Greenhouse and the growing-pits should run from north to south; thus the sun will rise on one side and set on the other, both sides getting their fair share of sunshine, whilst it will be right over the centre at mid-day.

SHADING. This is an important item in plant-growing. It is best effected by means of roller-blinds, having a reel and cord at one end by which they can easily be let up and down. Fine tiffany is the best material. Wooden blinds are also used; these consist of strips 1½in. wide, having ½in. space in between, and bound together by cords. They

Greenhouse—*continued.*

are also made to roll up and down, but require to run on supports about 1ft. above the surface of the glass.

Permanent shading consisting of washes should never be used; it is very injurious to plants to be continually shaded on dull days, especially in spring and autumn, when maybe there are several dull days in succession. On the other hand, blinds require constant attention, as many valuable plants are frequently spoilt when in full blossom by the careless cultivator going away and leaving the blinds up, when during his absence the sun has come out and shone fiercely. Permanent shading may be used for the sides of the house, but even there tiffany, hung up by means of hooks and rings, and fastened in a like manner at the base, is better. These blinds may be replaced in winter by blanket ones, which will be of great advantage on exceptionally cold nights or in windy weather, for keeping the heat in.

HEATING. *See* the article under this heading in Vol. II.

VENTILATION. The art of giving the right amount of air at the right time can only be acquired after long experience. All the houses should be plentifully supplied with ventilators, especially the Greenhouse. This should have lights on hinges along each side of the house and along the whole length of the lantern on each side, and wooden ventilators under the shelves, let in the brickwork on a level with the pipes, all opening from the inside.

Plenty of air should be given on every occasion when it can be done without lowering the temperature unduly. Fresh air is life to plants, but when cold and damp it is injurious, and should be excluded. When a cold or strong wind is blowing only those ventilators on the opposite side from that which is exposed thereto should be opened. Bottom air can always be given by means of the ventilators in the brickwork, except when the thermometer stands below freezing-point, or the wind is very cold. By this means the air of the house is kept fresh, whilst by passing over the pipes first it is warmed before reaching the plants.

The same rules apply to the growing-pits, except that not quite so much air should be given to many plants making growth as to those that have finished flowering or are in full blossom, and this shows the necessity of having a warm as well as a cool pit even in summer. Each pit should have ventilators at the top of the roof, and also at the sides between the roof and the ground. When the nights are cool, but the sun is strong and bright during the day, the temperature may be kept up by closing the ventilators early and storing the sun heat.

In the frames air can be given by means of wooden blocks notched in stair fashion, so that the lights can be raised to various heights when it is not desired to remove them altogether.

WATER TANKS. Every Greenhouse should be provided with water tanks. These can be let in the ground on a level with the floor, and service water laid on; but they should also be made to collect all the rain-water from the roof, and this should be used in preference to any other. It is as well to have a couple of hot-water pipes running through the tanks, so that the water may be heated to the same temperature as that of the house. Self-registering thermometers should be placed in every house, so that variations of temperature may be observed.

GENERAL CULTURAL HINTS. As greenhouse plants vary so much in their habit and growth, they require different methods of treatment and different composts for growing in, the various soils for making which should always be stacked for some time before using.

Watering requires extreme care. It is almost impossible to tell anyone how to water properly, but the cultivator who takes a real interest in his plants will soon get to know the requirements of each individual, and will water it accordingly. On no account should a plant—except in special cases—be allowed to become dry. Very often a plant will suffer so much damage from being dry for only one day that it will not recover during the rest of the year. Generally if the pot in which a plant is growing gives a hollow ring when tapped it may be said to be dry, but this is not always a true test, and one can only tell correctly after long experience. Again, care must be exercised not to over-water, as quite as much damage can be done in that way. The great art is to give a plant water just sufficient at the time when it is beginning to require it.

Greenhouse—*continued.*

All plants when potted should have perfectly clean pots and good drainage. If this latter becomes blocked it must be renewed, otherwise the soil will become sour and the plant will suffer. To prevent this, the drainage should be covered with some loose material, such as dry leaves or moss.

Worms are sometimes a great nuisance with pot-plants. They can often be got at by carefully knocking the plant out of the pot, taking care not to injure the roots or break the ball. If this cannot be done, watering with soot or clear lime-water will kill them.

When potting it is important that the compost should be in good condition—neither dry nor wet. It is a good test to take a handful and give it a good squeeze; then if it remains in a lump, which will yet readily break up when thrown down, it may be said to be fit for use. Sufficient room must be left between the surface of the soil and the rim of the pot to enable it to hold a good quantity of water.

Plants which have been potted on should always be kept a little closer and warmer than they have previously been till they have recovered the check. One good soaking should be given and the plants allowed to go without water for a time, but not to become dry. If it is summer, and the foliage is inclined to flag, syringe gently overhead three or four times a day.

Careful attention must be paid to the watering of freshly-potted plants, as numbers are often killed from over-watering. It must be borne in mind that the soil round a freshly-potted plant has no roots in it, and therefore nothing to absorb the moisture; and if this be kept wet it will become sour, so that when the plant begins to send fresh roots into it, instead of growing they will be poisoned and rot off. It will thus be seen that it is best to keep the plant rather on the dry side till its roots have got a good hold and are capable of assimilating the moisture.

All plants must be watered before potting, for if the ball is dry at that time it can never be got moist again by watering after potting.

The gravel on which the plants stand, and the floors of the houses, should receive a slight sprinkling of water throughout the year—except when damp, close weather prevails—at least once a day in the cool pit and Greenhouse, and oftener in the warm pit. In very hot weather during summer this should be repeated three or four times, at the same time syringing the plants overhead, giving those that are in blossom just a slight spray, and letting those that are not have the full benefit of the syringe.

Many people are afraid to syringe plants in blossom, saying that the flowers are thus caused to damp, or are discoloured. This is a great mistake, for if it is done whilst the air is dry, with full ventilation on the house and the blinds down, it is of the greatest benefit, enabling the flowers to last much longer. It must, however, be done carefully, in order to avoid bruising, and only perfectly clean water should be used. Watering should be done with a rose-can to avoid washing the soil out of the pots. The summer watering is best done in the afternoon after four o'clock, and in winter in the morning.

Cleanliness is most important for the health of the plants, washing frequently leaves and pots, and continually removing dead foliage or flowers, for these, if allowed to remain, form breeding grounds for fungi, as well as looking unsightly. By continually cleaning the house noxious insects are turned out of their hiding places, whilst when the glass is kept clean the maximum amount of light is admitted. All these may seem trivial matters, but it is attention to such small details that makes the difference between good and bad cultivation.

Never allow a plant to spoil for want of a stake. Many weak-stemmed or top-heavy plants require stakes, and in the case of those that throw up several flowering stems each should have a separate one, which looks better than when only one is placed in the centre. Use the stakes as thin as possible, provided they are sufficiently strong for the purpose. Bamboos painted green are best, being light, strong, and durable, and they can be obtained in all sizes.

Arrangement is a matter requiring careful consideration. Never put two similar colours together. It is better to have batches of one species arranged in groups. The finest effects are obtained when two species of contrasting colours are mixed together, and fine foliage plants dotted

Greenhouse—*continued.*

in between. A splendid effect may be obtained by mixing plants having tall loose spikes of flower amongst other dwarfer-growing kinds of a contrasting colour.

Avoid overcrowding. A far better effect is always obtained by having a few good groups with plenty of room between the plants, so that their full beauty may be seen, than by having a lot huddled together, which is not good either for the plants or for the observer.

PESTS are a continual source of trouble to the cultivator of Greenhouse plants. Green Fly, Red Spider, Thrips, Mealy Bug, and Scale are the chief enemies. For all these, except the last, fumigation with the XL All Vaporiser and Liquid is the best and safest remedy for any plant, whether in blossom or not, but is rather expensive. Tobacco-paper may also be used with good effect for the first-named, but many plants cannot stand it, especially if young and tender, whilst most flowers will suffer. Syringing or sponging with some insecticide is very effective, and is necessary for Scale, but these preparations must be used with care, especially in the case of young or rough-leaved plants. Small plants may be dipped in a solution of insecticide, but in any case they should all be washed clean an hour or so later with pure water. A safe insecticide is Fir-tree Oil; while a cheap and safe one is hot water (140deg. Fahr.).

GREEN MANURING. This is one of the best and cheapest ways of adding humus or organic matter, to poor sandy soils especially. The term is applied to some quick-growing crop, such as mustard, which is ploughed in green. Green Manuring adds nothing to the mineral matter of the soil. Its utility is due to its getting organic matter from the carbonic acid of the air; and also, as in the case of leguminous plants, a certain amount of nitrogen from the same source. The roots of green crops bring up plant-food from the subsoil to the surface for the use of succeeding crops. Green Manuring helps to smother weeds, and it may in some cases destroy insects. Various crops are used for Green Manuring: they should be quickly-growing plants yielding a large quantity of green stuff. The crop should be ploughed or dug in when the weather is moderately moist and warm to favour decomposition.

GREEN PUG MOTH (*Eupithecia rectangulata*). Of insects seldom recorded as hurtful in gardens the Green Pug is one. Yet to both Apple and Pear trees its caterpillars are decidedly injurious, feeding as they do upon the blossoms, the principal parts of which they consume, and then spin together the petals by means of a web. The Moth is a very common one in this country, as well as in North and Central Europe; and in France the damage inflicted by it is very great. By reason of their habits, the caterpillars are not often detected, and they are somewhat difficult to deal with also on that account.

The Moths are about $\frac{3}{4}$in. in stretch of wings, and very variable as to colour: they are found in June and July, and are nocturnal. Usually the wings are green, striped with blackish-grey, and near their centre is a black spot. Sometimes, however, grey-brown, and even almost black specimens are found. At rest these insects may be found in the daytime on fences and walls in the vicinity of their food-plants, and they should always be destroyed.

The eggs are laid upon the buds, and here they remain until the early spring of the following season, when they hatch out. The larvæ are stoutish, and of a pale yellowish-green, with a darker green or a dull red stripe down the back. When about to become pupæ the pests drop from their food-plant, and make a slight cocoon of earth.

Wherever the blossoms in early spring are observed prematurely to brown, it would be advisable to examine them for the caterpillars. If found, boards covered with tar should be arranged beneath the trees, which should be tapped at night, when the caterpillars are readily alarmed and many will drop. These should be collected and destroyed. Spraying with an insecticide is of no use in such an infestation; in fact, an arsenite is likely to do more harm than good. Where fowls are allowed to run in an orchard or in a garden they would destroy large numbers of the larvæ if the soil beneath be roughly dug. Insectivorous birds, like starlings, should always be encouraged.

GREEN-VEINED WHITE BUTTERFLY (*Pieris napi*). *See* **Cabbage Caterpillars,** in present volume.

GREENWEED. This name is also applied to **Genista pilosa** (which *see*).

GREIGIA. Three species of this genus are described by J. G. Baker, natives of sub-temperate Chili. They are distinguished from *Karatas* by having large lateral heads of flowers, basifixed anthers, and exserted, falcate, untwisted stigmas. Fruit a large, whitish, rather pulpy berry. Leaves very long.

G. clandestina (secret). A synonym of *G. sphacelata.*

GREVILLEA. To the species described on pp. 97-8, Vol. II., the following should be added:

G. annulifera (annulet-bearing).* *fl.* sulphur-yellow, shortly pedicellate; perianth ¼in. long; style upwards of 1in. long, curved, very stout; racemes 3in. to 4in. long, shortly pedunculate, panicled at the ends of the branches. July. *l.* spreading and recurved, 3in. to 5in. long, pinnate; segments 1in. long, distant, linear-subulate, rigid; petioles ¼in. to 1in. long. *h.* 6ft. to 8ft. Shrub. (B. M. 6687.)

G. Hilliana (Hill's). *fl.* small and very numerous, in dense, cylindrical racemes 4in. to 8in. long. *l.* petiolate, either entire, ovate-oblong or elliptical, 6in. to 8in. long or longer, and deeply divided at the end into two or three lobes, or deeply pinnatifid with five to seven lobes. 1862. A large tree. (B. M. 7524.)

G. Hookeriana (Hooker's). *fl.* dull yellowish, about ¼in. long, with long, crimson styles; racemes 2in. to 3in. long, dense, one-sided. *l.* rigid, pinnate, having three to nine pairs of linear segments. 1886. (B. M. 6879.)

G. pulchella (rather pretty).* *fl.* white, in dense, terminal or axillary, usually glabrous racemes ¼in. to 1in. long. *l.* pinnate, 1½in. to 3in. long; segments seven to eleven, cuneate, trifid or three-toothed. *h.* 1ft. to 2ft. 1879. A slender, divaricate shrub or under-shrub. (B. M. 5979.)

G. robusta elegantissima (very elegant).* *l.* broader than in the type. 1892. A robust and charming variety.

G. Thelemanniana splendens (splendid). *fl.* crimson, larger than in the type; spikes short, dense, recurved. *l.* bipinnatifid, rigid; segments linear. 1883. This is apparently a form of *G. Wilsoni.* (R. H. 1882, p. 456.)

GREWIA. To the species described on p. 98, Vol. II., the following should be added:

G. orientalis (Eastern). *fl.* yellowish-white, three to a peduncle. July and August. *l.* ovate-oblong, acuminate, crenulate, velvety, reddish when young. India, 1767.

G. parviflora (small-flowered). *fl.* yellow, small, in dense, pedunculate umbels hidden by the leaves. *l.* large, unequally serrated, with three prominent veins, hispidulous above, whitish beneath. *h.* 2ft. to 3ft. North China, 1888. Of more botanical than horticultural interest.

FIG. 422. GREY DAGGER MOTH AND CATERPILLAR.

GREY DAGGER MOTH (*Acronycta psi*). A distinctive, very destructive, and common insect, whose caterpillars feed upon a large number of garden plants —Plums, Pears, Roses, &c. The Moth (Fig. 422) is on the wing during May and June. It is about 1½in. in spread of wings. The fore-wings are grey-whitish, thickly dotted with brown, with numerous lines, and the distinctive markings near the anal angle resembling the Greek ψ, are responsible for the common name. The hind-wings are whitish, sprinkled with greyish. The eggs are deposited singly. The larvæ (Fig. 422) are conspicuous, being of a blackish-grey, with a broad, yellowish dorsal stripe, broad, whitish stripe at side, and a lateral series of orange or reddish marks. Segment five bears a long, narrow, blackish prominence or tubercle; while segment twelve has a smaller one. There are numerous yellowish and blackish hair-tufts. The larvæ, although so conspicuous, are not taken by many birds, probably on account of their hairy nature. The larvæ are feeding during August and September. The pupa-state is passed in a cocoon in a crevice of the food-plant.

Except in the case of fruit-trees, the caterpillars would be best destroyed by poisoning their food-plant with one of the arsenites. Plum and Pear trees at the time stated should be syringed with weak Kerosene Emulsion or a similar preparation.

GREY GUM. *See* **Eucalyptus resinifera.**

GRIELUM (from *graios*, old; in allusion to the hoary leaves). ORD. *Rosaceæ.* A small genus (three species) of greenhouse annuals, natives of South Africa. Flowers yellow, large, solitary, on axillary peduncles; petals five; stamens ten. Leaves alternate, hoary, pinnately decompound. *G. humifusum* and *G. tenuifolium* have been introduced, but are probably no longer in cultivation.

GRIFFINIA. To the species described on p. 99, Vol. II., the following should be added:

G. hyacinthina micrantha (small-flowered). In this variety the flowers scarcely exceed 1in. in length. 1880.

G. intermedia (intermediate). *fl.*, perianth pale lilac, 1½in. to 2in. long, the tube short, the segments oblanceolate; umbel six- to ten-flowered; peduncle slender, 1ft. long. *l.* oblong, acute, cuneately narrowed into a long petiole. Bulb ovoid, longer than in *G. hyacinthina.* (B. R. 990.)

G. Liboniana (Libon's). *fl.*, perianth pale lilac, 1in. to 1½in. long, with scarcely any tube; umbel six- to eight-flowered; peduncle two-edged, 1ft. long. March. *l.* five or six, contemporary with the flowers, sessile, oblong, acute, 3in. to 4in. long. Bulb 1in. in diameter. 1843. (L. J. F. 290.)

G. parviflora (small-flowered). *fl.*, perianth pale lilac, ⅜in. to 1in. long, the segments lanceolate-unguiculate; umbel ten- to fifteen-flowered; peduncle nearly 1ft. long. February. *l.* three or four to a bulb, contemporary with the flowers, oblong, acute, 6in. long, narrowed to a 6in. petiole. Bulb ovoid, 2in. to 3in. in diameter. 1815. (B. R. 511.)

GRINDELIA. SYN. *Demetria.* Flower-heads heterogamous, radiate, or rarely homogamous through the rays being absent; involucral bracts in many series; receptacle flat or convex.

G. coronopifolia (Coronopus-leaved). A synonym of *Xanthocephalum centauroides.*

G. grandiflora is a form of *G. squarrosa.*

GRISEBACHIA. A synonym of **Howea** (which *see*).

GRISELINIA. SYNS. *Decostea, Pukateria, Scopolia* (of Forster). Flowers minute. As now constituted, according to the "Index Kewensis," this genus comprises only the two species described on p. 98, Vol. II.

GRONOPHYLLUM (from *grone*, a hollow or cave, and *phyllon*, a leaf; probably referring to the shape of the perianth segments). ORD. *Palmæ.* A small genus (four species) of unarmed, stove Palms, with a slender, annulate trunk, natives of New Guinea and the Celebes. Spadix shortly pedunculate; complete spathes three, elongated, caducous; bracts and bracteoles connate in a very short ring. Fruit small. Leaves terminal, equally pinnatisect; segments cuneate, one- to three-nerved. *G. microcarpum* is in the Kew Collection, but is not generally cultivated.

GROTTO. Usually a dell in which the sides are lined with rockwork, tree-roots, or tree-stems, arranged with taste and planted with Ferns, trailing plants, and other subjects liking more or less shade. Such Grottoes always look best when a stream is trickling through them, or when a pond is near; and if under trees they form a cool and pleasant resort during the summer months.

GROUND BEETLES. A popular name for the very large family *Carabidæ*, several of whose members are amongst the commonest and most useful of our native garden Beetles. Familiar species are *Carabus nemoralis*, *C. violaceus*, and *C. monilis*, all of which are found in gardens. To this family also belongs the beautiful *C. auratus*, which upon the Continent is so instrumental in keeping at bay the destructive Cockchafers, whose grubs they devour. Although several times recorded in England, this bright green, golden-sheened Beetle cannot fairly be claimed as indigenous. *See* **Beetles.**

GROUND CISTUS. *See* **Rhodothamnus Chamæcistus.**

GROUND-HELE. *See* **Veronica officinalis.**

GROUND HEMLOCK. *See* **Taxus canadensis.**

GROUND NUT. *See* **Apios tuberosa.**

GROUND RATTAN CANE. *See* **Rhapis flabelliformis.**

GROVE. A quantity of trees planted with a view to effect, and with no undergrowth in the form of bushes, &c., is a Grove. When the trees are well developed, with a carpet of grass underneath, a Grove is one of the most charming retreats during the summer and autumn.

GRUB. A popular name bestowed upon the larvæ of insects, but more especially those of Beetles.

GRYLLIDÆ, or **CRICKETS.** *See* **Crickets,** in Vol. I.; and **Acheta,** in present volume.

GUAGNEBINA. A synonym of **Manettia** (which *see*).

GUAPEBA. A synonym of **Lucuma** (which *see*).

GUATTERIA. *See also* **Polyalthia,** the species of which are sometimes classed under *Guatteria*.

GUAVA. The fruits of *Psidium Guava* and *P. Cattleyanum* are known in commerce by this name. They are edible and astringent.

GUETTARDA. *G. lucida* and *G. tomentosa* are described under **Stenostomum,** which is now included by botanists under **Antirrhœa.**

GUEVINA. According to the latest authorities, *Gevuina* is the correct spelling.

GUEVINA AVELLANA. A name given in Italian gardens to **Elæodendron sphærophyllum pubescens** (which *see*).

GUINEA PLUM. *See* **Parinarium excelsum.**

GUINEA WHEAT. *See* **Zea Mays.**

GUIZOTIA OLEIFERA. The correct name of **Veslingia sativa** (which *see*).

GULDENSTÆDTIA. A synonym of **Eurotia** (which *see*).

GULUBIA COSTATA. According to the "Index Kewensis," this is the correct name of **Kentia costata** (which *see*).

GUM. A product of secretion, obtained from the sap of many plants.

GUM ARABIC. *See* **Acacia arabica** and **A. vera.**

GUM SENEGAL. *See* **Acacia Senegal.**

GUM-TREE, CAPE. *See* **Widdringtonia juniperoides.**

GUMIRA. A synonym of **Premna** (which *see*).

GUMMING, or **GUMMOSIS.** The origin of this condition usually associated with Vines, and popularly known as Gumming, has never been satisfactorily determined. As stated in Vol. II., by some it is ascribed to a species of *Coryneum*; while by others it is thought to be brought about by errors in cultivation at pruning time. Mr. W. G. Smith, in an interesting contribution to the "Gardener's Chronicle" on certain obscure diseases of Vines, says that "Gumming" is an excessive formation of gummy substances found in every Vine.

In the "Kew Bulletin" for 1899, Mr. Massee refers to the fact of many specimens of *Prunus japonica* being killed at Kew by a disease which agreed in character with

Gumming, or **Gummosis**—*continued.*

what is known as Gummosis. The substance which oozed out consisted of almost colourless drops of gum; these sometimes coalesced, forming irregularly-shaped masses, which when removed disclosed a large wound. The fungus in this case responsible for the mischief Mr. Massee names *Cladosporium epiphyllum*, and considers that this is the first time that the disease has been directly proved to be due to a fungus. He advocates resorting to collar-pruning and replacing the soil under the shrub with fresh, and also providing a layer of quicklime.

GUNDELSHEIMERA. A synonym of **Gundelia** (which *see*).

GUNNERA. Prickly Rhubarb. In addition to the species described on p. 102, Vol. II., *G. brephogea* (I. H. 1872, t. 111), a Colombian species, and *G. insignis*, from Chili, have been introduced to European gardens.

G. chilensis (Chilian). The correct name of *G. scabra.*

GUNNIA. Included under **Sarcochilus** (which *see*).

GUSTAVIA. *G. superba* is the correct name of *G. insignis*. *G. brasiliensis* and *G. Theophrasta* have also been introduced to Continental gardens.

GUTIERREZIA. The following species is a hardy, suffruticose plant, thriving in dry soil. It may be increased by seeds or by divisions.

G. Euthamiæ (Euthamia-like). *fl.-heads* golden-yellow, small, profusely disposed in a compound, fastigiate, contracted corymb. *l.* crowded, narrow-linear, acute, slightly scabrous. Western United States, 1896.

GUTTA-GUM TREE. *See* **Vismia guianensis.**

GUTTATE. Covered with small dots, as if sprinkled.

GUZMANIA. Sepals shortly connate at base; corolla gamopetalous, with oblong segments much shorter than the cylindrical tube. Capsule, leaves, and habit as in *Tillandsia*. Other species formerly included here are now classed under **Æchmea, Caraguata, Karatas, Tillandsia,** &c. (which *see*).

G. Bulliana (Bull's). A synonym of *Caraguata angustifolia.*

G. Devansayana. The correct name is *Caraguata Devansayana.*

G. fragrans. A variety of *G. tricolor.* The name has also been applied to *Æchmea eburnea.*

G. Melinoki (Mélinok's). A synonym of *Caraguata Melinonis.*

G. tricolor. The following are fine garden varieties: *erythrocephala*, *fragrans*, *grandis*, *maculata*, and *Sallieri* (the first-named said to have a spike 10in. in circumference).

GYAS. A synonym of **Bletia** (which *see*).

GYMNANTHUS. A synonym of **Trochodendron** (which *see*).

GYMNEMA. Cymes clustered or umbel-like, often bifid from the base, sessile or shortly pedunculate in an axil.

G. tenacissima (very tenacious). A synonym of *Marsdenia tenacissima.*

GYMNOCLADUS. Another species has been added to this formerly monotypic genus, described on p. 103, Vol. II. Flowers whitish, in terminal, simple racemes or raceme-like thyrses. Pods sessile, oblong, sub-falcate, thick, turgid, or sub-terete, two-valved, containing pulp between the seeds. Leaves bipinnate; leaflets ovate, membranous.

G. chinensis (Chinese). Soap-tree. *fl.* inconspicuous, in short racemes. *fr.* 3in. to 4in. long, very thick, containing a soft substance, used by the Chinese women for washing the face. *l.* large; pinnæ having numerous oblong, obtuse leaflets. China, 1899.

GYMNODISCUS (from *gymnos*, naked, and *diskos*, a disk; the disk florets have no pappus). ORD. *Compositæ.* A small genus (two species) of half-hardy, South African annuals, allied to *Othonna*. *G. capillaris* has been introduced, but is probably not now in cultivation.

GYMNOGRAMME. Including *Ceropteris*, *Leptogramme*, and *Syngramme.*

CULTURE. This very popular genus is remarkable for the attractive character of many of its species and varieties, and for the easy mode of cultivation under which some of the more robust kinds thrive. The Gymnogrammes form

Gymnogramme—*continued.*

FIG. 423. GYMNOGRAMME LEPTOPHYLLA.

the nucleus of that most interesting group the Gold and Silver Ferns, the under-side of the foliage of many of them being covered with farina of a colour varying from the purest white to shades of yellow of different degrees of intensity. Sometimes plants are found which bear fronds suffused with white and yellow powder at the same

FIG. 424. BACK OF FROND OF GYMNOGRAMME ALISMÆFOLIA.

Gymnogramme—*continued.*

time: this sort of dimorphism in colours may frequently be observed in forms derived from the *calomelanos* type, which also sometimes produce fronds provided with the usual covering on one half, whereas the other portion is completely destitute of the coloured powder. Such instances, however, can only be regarded as curiosities. The same remark is also applicable to the varieties with forked

FIG. 425. GYMNOGRAMME ANDERSONI.

or crested fronds, which under cultivation Gymnogrammes have a peculiar tendency to produce: of these *G. calomelanos chrysophylla Parsonsii* and *G. pulchella Wettenhalliana* are excellent examples. Then there are also a

FIG. 426. FROND OF GYMNOGRAMME CHÆROPHYLLA.

few kinds, such as *G. rufa*, *G. tomentosa*, *G. vestita*, &c., which are totally devoid of any powder whatever, and in which that principal ornament is replaced by a covering of reddish or silvery hairs, giving the plants a downy appearance that is very attractive.

Gymnogramme—*continued.*

All the species are very ornamental, and the majority of them may be grown with great success in hanging-baskets, in which they show off their beautiful colours to perfection. Where this method of cultivating them is practicable it is really the most suitable, as these plants are fond of light and also of an atmosphere drier than that found in the ordinary Fernery or the warm plant-house. However, owing to their great size and robust growth, some kinds can only be grown in pots.

Gymnogrammes should be potted firmly in light material, made up of two parts fibrous peat, one part of leaf-mould (where this is not readily procurable, the same quantity of finely-chopped sphagnum may be substituted), and one part of silver-sand. Those grown in pots should not be mixed among other Ferns; they should be kept by themselves and out of reach of the water from the syringe, as they not only suffer from the effects of overhead watering, but also present a wretched appearance, the white or yellow meal being easily displaced by the slightest sprinkling. They grow very well and get much better coloured if kept without, or with only very light, shading, the light, however strong, never being too much for them, provided they have been accustomed to it from the first, and that plenty of ventilation is afforded. Although particularly fond of a dry atmosphere, Gymnogrammes are plants which suffer very much if water at the roots is not freely applied, and neglect in this respect often accounts for the diminutive size in which they are sometimes found in general collections.

FIG. 427. GYMNOGRAMME LANCEOLATA.

Gymnogrammes are readily propagated from their spores, which germinate freely and make handsome specimens in a comparatively short time.

As is the case with all large genera of Ferns, there are a few individuals which require special treatment, or which possess peculiarities not known to the general cultivator.

When first introduced, *G. japonica* was expected to become a good evergreen Fern for outdoor culture. In that respect it has not answered expectations, as it will only bear a few degrees of frost, and can hardly be called an evergreen, as the old fronds, although dying down gradually, have all disappeared by the time the new ones make their appearance. The general aspect of the plant is that of a broad-leaved *Pteris cretica* of a very dark colour and stiff habit. It is a great lover of moisture, and to do well requires a quantity of water at the roots all the year round. The soil which suits it best is a mixture of about equal quantities of peat and fibrous loam. The plant has a great antipathy to being potted hard, and particularly dislikes water on the fronds, which turn black in a very short time if subjected to frequent syringings.

Although generally considered fairly hardy, *G. leptophylla* (Fig. 423) thrives best in the warm house, where

Gymnogramme—*continued.*

one frequently finds seedlings coming up spontaneously on the surface of the pots containing other plants. A warm, shady, moist nook in the Fernery is therefore the most suitable situation. The compost which this species prefers is one made of equal parts leaf-mould, peat, and loam, with a little sand. It also requires, while growing, an abundant supply of water at the roots, but must have thoroughly good drainage.

G. trifoliata is a robust species, and under liberal treatment, and when grown in such a place that its gradually-extending fronds can be trained near the glass of the roof, it forms a very picturesque object.

FIG. 423. GYMNOGRAMME MICROPHYLLA.

Other interesting kinds are *G. alismæfolia*, with Alisma-like fronds (Fig. 424); *G. Andersoni* (Fig. 425), a minute species; the elegant *G. chærophylla* (Fig. 426); *G. lanceolata* (Fig. 427), which in its native country is frequently found growing upon trees; and the small *G. microphylla* (Fig. 428).

To the species and varieties described on pp. 104-5, Vol. II., the following should be added:

G. argentea (silvery). *sti.* slender, glossy, chestnut-brown, 2in. to 3in. long. *fronds* deltoid, quadripinnatifid; pinnæ often distant, deltoid, the lowest 3in. to 4in. long, 2in. broad, of a

FIG. 429. GYMNOGRAMME CORDATA.

Gymnogramme—*continued.*

soft texture; under-side coated with a white powder, sometimes tinged with red. *sori* pale brown. Natal and the Mascarene Islands. SYN. *Ceropteris argentea.* The form *aurea* has yellow powder.

G. calomelanos chrysophylla farinifera (farina-bearing). *cau.* short. *sti.* quadrangular, channelled, blackish, minutely white-dotted. *fronds* white beneath, mealy above. 1886. (I. H. 1886, 604.)

G. c. c. grandiceps (large-crested). A fine, crested variety.

G. c. c. Laucheana grandiceps (Lauche's, large-headed).* *fronds* elongated, bipinnate, terminating in a broadly-tasselled, drooping apex, the under-surface clothed with palish yellow meal; segments blunt at the end. 1882. The most striking of all the Gold Ferns.

Other sub-varieties of *chrysophylla* are: *Alstoniæ, grandiceps, multiceps, Parsonsii*; and of *peruviana* there are forms known as *argyrophylla* and *Mayii.*

Gymnogramme—*continued.*

G. elegantissima (most elegant). See Fig. 430. A synonym of *G. decomposita.*

G. elliptica (elliptic). *rhiz.* wide-creeping, woody. *sti.* naked, 1ft. or more in length. *fronds* soft, 1ft. to 1½ft. long, 6in. to 9in. broad, cut down nearly to the rachis in the upper, and quite in the lower, part into four to six narrow-oblong or elliptic pinnæ on each side. *sori* narrow, oblique, reaching the midrib but not the edge. Himalayas, Queensland, &c. Greenhouse. SYNS. *G. decurrens, Selliguea elliptica.*

G. Féei (Fée's). *rhiz.* wide-creeping, furnished with very bright brown scales. *fronds* dimorphous; barren ones 3in. to 4in. long, 1¼in. to 2in. broad, oblong-ovate, borne on stipes 1in. to 3in. long; fertile ones a little longer and narrower, and with shorter stipes; both entire, acute, coriaceous, conspicuously veined and smooth on both sides. *sori* narrow-oblong, in single rows between the main veins, not reaching either the midrib or the edge. Malaya. See Fig. 431. SYN. *Selliguea Féei.*

FIG. 430. GYMNOGRAMME ELEGANTISSIMA.

G. chrysophylla (golden-leaved). A variety of *G. calomelanos.*

G. cordata (heart-shaped).* *sti.* glossy, black, 1in. to 2in. long, scaly. *fronds* somewhat ovate, 3in. to 6in. long, 1¼in. to 2in. broad, bipinnatifid; pinnæ oblong; lobes nearly round, deeply toothed, somewhat coriaceous, naked above, densely coated below with rusty-brown scales. *sori* at first linear, eventually confluent and covering the greater part of the pinnæ. Cape Colony, Bourbon Island, &c., 1838. See Fig. 429.

G. decurrens (running down). A synonym of *G. elliptica.*

G. diplazioides (Diplazium-like). *sti.* 3in. to 4in. long, scaly below. *fronds* soft, 1½ft. to 2ft. long, bipinnatifid; central pinnæ 3in. to 4in. long, ¾in. to 1in. broad, cut down about two-thirds of the way into blunt, entire lobes, the lower ones gradually reduced. *sori* oblong, often reaching from the midrib to the edge. Mexico and the West Indies. SYNS. *G. Linkiana, G. rupestris, Leptogramme diplazioides.*

G. flavens (yellowish). A synonym of *Nothochlæna flavens.*

G. fraxinea (Ash-like) A synonym of *G. javanica.*

G. gracilis (slender).* *sti.* short, glossy, scaly, about 4in. long. *fronds* very handsome, 2ft. to 4ft. long, 1ft. or more in width, soft, bipinnatifid; central pinnæ 4in. to 8in. long, 1in. to 1¼in. broad, cut down nearly to the midrib into slightly falcate lobes. *sori* nearer the edge than the midrib. Jamaica and Guadeloupe. See Fig. 432. SYN. *Leptogramme gracilis.*

G. Hookeri (Hooker's). *sti.* 4in. to 6in. long, firm, covered (as well as the under-surface of the fronds) with rusty-brown down. *fronds* coriaceous, 9in. to 15in. long, 4in. to 5in. broad, bipinnate; leaflets lanceolate; pinnules narrow-oblong, entire or slightly toothed, ¼in. to ½in. long, with inrolled edges. *sori* oblong, thick, at length covering the whole under-surface and covered by the down. Andes of Colombia. See Fig. 433.

Gymnogramme—*continued.*

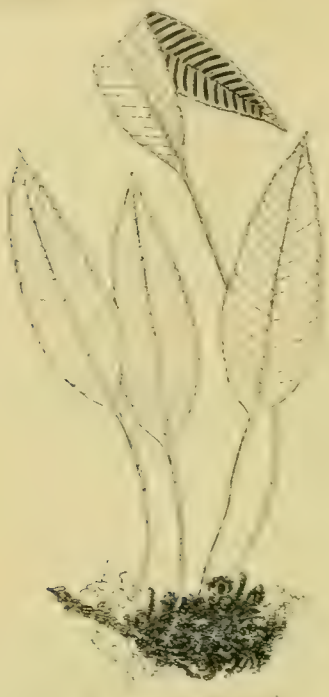

FIG. 431. GYMNOGRAMME FÉEI.

G. Laucheana (Lauche's). This and its forms are all varieties of *G. calomelanos chrysophylla.*

G. L'Herminieri (L'Herminier's). A form of *G. calomelanos chrysophylla.*

G. Linkiana (Link's). A synonym of *G. diplazioides.*

FIG. 432. PORTION OF FROND OF GYMNOGRAMME GRACILIS.

Gymnogramme—*continued.*

G. Matthewsii (Matthews'). *sti.* 4in. to 6in. long, dark chestnut-brown, clothed with dense, brown hairs. *fronds* tripinnatifid, coriaceous, 1ft. to 1½ft. long, 4in. to 5in. broad, oblong-lanceolate; pinnæ 2in. long, 1in. broad, cut down to the midrib below into oblong, blunt pinnules, with broad, rounded lobes, hairy on both sides. *sori* of a conspicuous brown. Peru.

FIG. 433. FROND OF GYMNOGRAMME HOOKERI.

G. Mayii (May's). This name is applied to forms of *G. calomelanos peruviana* and *G. pulchella.*

G. Muelleri (Mueller's). *sti.* wiry, 3in. to 4in. long, densely clothed with rusty-brown scales. *fronds* pinnate, 4in. to 10in. long, 1in. to 3½in. broad; pinnæ sessile, roundish or oblong,

FIG. 434. FROND OF GYMNOGRAMME MUELLERI.

1½in. long, ½in. broad, entire, thick, coriaceous, the lower ones often auricled; lower surface densely matted with brownish scales. *sori* abundant, narrow, in several rows nearer the edge than the midrib, eventually connivent. Australia. See Fig. 434. This singular and interesting greenhouse or stove species when young resembles *Asplenium Ceterach.*

Gymnogramme—*continued.*

G. multiceps (many-headed). A form of *G. calomelanos.*

G. ochracea (ochreous). A garden synonym of *G. tartarea.*

G. Parsonsii (Parsons'). A form of *G. calomelanos.*

G. Pearcei. A pinna of this very elegant, stove species is shown in Fig. 435.

G. P. robusta (stout).* *sti.* covered at base with white powder. *fronds* narrower at the base and more elongated towards the apex than in the type. 1883. Plant larger in all its parts.

Gymnogramme—*continued.*

G. trifoliata. In general aspect, this erect species (described in Vol. II.) has several characters peculiar to itself. See Fig. 437.

G. Veitchii (Veitch's). This is a supposed hybrid between *G. decomposita* and *G. Pearcei robusta.* 1894.

G. vestita (clothed).* *sti.* wiry, 3in. to 6in. long, densely clothed with matted, rusty-brown, silky scales. *fronds* 6in. to 12in. long, 1in. to 1½in. broad, pinnate; pinnæ opposite or alternate, set close to the midrib, with a little space between each,

FIG. 435. PORTION OF FROND (ONE PINNA) OF GYMNOGRAMME PEARCEI.

FIG. 436. FROND OF GYMNOGRAMME PULCHELLA WETTENHALLIANA.

FIG. 437. GYMNOGRAMME TRIFOLIATA.

G. peruviana (Peruvian). A form of *G. calomelanos.*

G. p. argyrophylla (Peruvian, silvery-leaved). A garden synonym of *G. calomelanos peruviana.*

G. pulchella Wettenhalliana (Wettenhall's).* *fronds* having their extremities so crested as to form a large corymb; their pinnæ are also densely crested. A highly decorative garden variety. See Fig. 436. *Mayi* is another form.

G. rupestris (rock-loving). A synonym of *G. diplazioides.*

G. Sprengeriana (Sprenger's). A garden hybrid between *G. argentea* and *G. calomelanos chrysophylla Lauchcana.* 1897.

G. sulphurea. There is a crested variety—*grandiceps.*

entire, bluntish, oblong or cordate at base, thick but flaccid, covered on both sides with velvety hairs, at first silvery, afterwards rusty-brown. *sori* usually forked, disposed over the whole under-surface. Pekin, Himalayas, &c. Stove or greenhouse. See Fig. 438.

G. ampla, G. cantoniensis, G. dobroydense, and *G. vellea* have also been introduced, but are rare in cultivation.

GYMNOLOMIA. To the species described on p. 105, Vol. II., the following should be added:

G. maculata (spotted). A synonym of *Wulfia maculata.*

FIG. 438. FROND OF GYMNOGRAMME VESTITA.

G. Totta (Hottentot). *rhiz.* decumbent. *sti.* 6in. to 12in. long, slightly scaly below. *fronds* soft, 1ft. to 1½ft. long, 6in. to 10in. broad, bipinnatifid; pinnæ sessile, lanceolate, 3in. to 5in. long, about 1in. broad, with blunt, undivided lobes reaching about half-way down. *sori* narrow-oblong, simple, sometimes very profuse. South Africa, India, &c. A strong-growing and distinct species. SYN. *Leptogramme Totta.*

G. triplinervia (triple-nerved). *fl.-heads* yellow, axillary, long-pedunculate; pappus crown-like. July to September. *l.* petiolate, ovate, narrowly acuminate, crenate-toothed, triple-nerved, adpressedly hispidulous on both sides. *h.* 3ft. Bogota, 1825. SYN. *Gymnopsis triplinervia.*

G. uniserialis (in one series). A synonym of *Sclerocarpus uniserialis.*

GYMNOSPERMEÆ. An important class of exogenous plants (but often made a sub-class of the *Dicotyledoneæ*), characterised by naked ovules and by the absence of a perianth (except in the *Gnetaceæ*). Cotyledons two or more; flowers strictly unisexual. The class embraces the three orders *Coniferæ*, *Cycadaceæ*, and *Gnetaceæ*.

GYMNOSPORIA (from *gymnos*, naked, and *sporos*, seed). SYN. *Catha* (of Endlicher). ORD. *Celastrineæ*. A genus comprising about sixty species of stove shrubs or small trees, distributed over the hotter parts of the whole world. Flowers in small, dichotomous cymes; calyx four- or five-cleft; petals four or five, spreading; stamens four or five, inserted underneath the disk. Leaves alternate, exstipulate. One or two of the species have been introduced, but are probably not now grown.

G. cassinoides (Cassine-like). The correct name of *Celastrus cassinoides*.

GYMNOSTACHYUM. About seventeen species are now referred to this genus. To those described on p. 106, Vol. II., the following should be added:

G. decurrens (decurrent). *fl.* white, disposed in a spike 8in. long, with a purple stalk. *l.* green and grey, with a purplish midrib, ovate, wavy, 4in. long. Stems short, branching. Penang, 1894.

G. Verschaffelti (Verschaffelt's), of I. H. A synonym of *Fittonia Verschaffeltii*.

GYMNOSTICHUM. A synonym of **Asperella** (which *see*).

GYMNOTERPE. A synonym of **Tapeinanthus** (which *see*).

GYMNOTHECA. *See* **Marattia.**

GYNANDRIRIS. Included under **Iris** (which *see*).

GYNERIUM. According to the "Index Kewensis," eight species are now referred to this genus. *G. argenteum*, described on p. 106, Vol. II., is now known as *Cortaderia argentea*.

G. argenteum aureo-lineatum (golden-lined). A variegated form. 1898.

G. saccharoides (Saccharum-like). *fl.*, panicle 5ft. to 6ft. long, elegantly arched, not unlike the common Pampas Grass (*G.* [Cortaderia] *argenteum*). September. *l.* distichous, 5ft. long, 1in. wide. Stems densely tufted, simple, 12ft. or more in height, 1in. thick at base, clothed with leaves. Tropical America, 1894. This stove aquatic yields the ornamental, feathery Grass used for the decoration of rooms, and which, after being imported into London, is dyed in various colours and sold as "Uva Grass." (B. M. 7352.)

GYNESTUM. A synonym of **Geonoma** (which *see*).

GYNETERIA (of Sprengel). A synonym of **Tessaria** (which *see*).

GYNHETERIA (of Willdenow). A synonym of **Tessaria** (which *see*).

GYNOCEPHALA. A synonym of **Phytocrene** (which *see*).

GYNOPLEURA (from *gyne*, a female, and *pleura*, side; the style rises from the side of the ovary). ORD. *Passiflorex*. A genus embracing six or seven species of greenhouse herbs, shrubby at base, pilose, tomentose or pubescent, natives of Chili. Flowers yellow or blue, often showy, paniculate or fascicled; calyx tube straight or slightly curved, campanulate or turbinate, the lobes five, oblong; petals obovate or spathulate, broader than the calyx lobes; corona slightly toothed; stamens five. Leaves alternate, sessile, linear, oblong, or spathulate, entire, sinuate-toothed, or sub-pinnatifid. The two species described below are best treated as greenhouse annuals, and thrive in a compost of sandy peat and fibry loam with a little leaf-mould. Seeds should be sown in March.

G. humilis (dwarf). *fl.* white, striped with purplish-red, about ¼in. in diameter, corymbosely crowded at the tips of the branches. September. *l.* about 1in. long, obovate-oblong, obtuse, coarsely crenate-serrated, narrowed but scarcely petiolate, pale green, silky-hairy. Chili, 1898. A low-growing, excessively branched, slender, hardy annual. (B. M. 7645.)

G. linearifolia (linear-leaved). *fl.* several in a panicle; perianth greenish-purple, with the five inner segments pale purplish-blue. September. *l.* 2in. to 3in. long, linear, obtuse, toothed, recurved. *h.* 1ft. to 1½ft. Andes of Chili, 1831. SYN. *Malesherbia linearifolia* (B. M. 3362).

GYNOPOGON. A synonym of **Alyxia** (which *see*).

GYNOXIS (in part). Included under **Senecio** (which *see*). The correct name of *G. fragrans* is *S. Skinneri*.

GYNURA. Involucral bracts ten to twelve, in one series, narrow; receptacle flat, pitted or shortly fibrillate. To the species described on p. 106, Vol. II., the following should be added:

G. ovalis is a form of *G. aurantiaca*.

G. sarmentosa (sarmentose). *fl.-heads* of a dull orange, numerous, narrow, ¼in. long, paniculate. *l.* petiolate or the upper ones sessile, 1½in. to 2½in. long, ovate, elliptic, or lanceolate, acute or acuminate, almost entire or sinuate-toothed. Stem reddish, and, as well as the branches, loosely twining. India, &c., 1892. (B. M. 7244.)

GYPSOPHILA. Including *Struthium*. Calyx turbinate-tubular or campanulate, five-toothed or five-cleft; petals five. To the species described on pp. 106-7, Vol. II., the following should be added:

G. elegans (elegant). *fl.* pink; petals broadly cuneate-linear, two to five times longer than the calyx. May to July. *l.* one-nerved; upper ones small, oblong-spathulate; the rest linear-lanceolate, acute, shortly connate at base. Stems 1ft. to 1½ft. high, dichotomously branched. Asia Minor, &c., 1823. A glabrous annual or perennial.

G. Manginii (Mangin's). *fl.* light rose-coloured, rather large, disposed in small panicles. *l.* very glaucous, glabrous. Roots thick, fleshy. Siberia, 1893. Perennial.

G. muralis (wall-loving). *fl.* pink; calyx turbinate; petals cuneate, truncate-sub-retuse or crenate. May to July. *l.* linear-subulate, acute. Stem filiform, much branched. North and Central Asia. Annual.

G. Raddeana (Radde's). *fl.* pale rose-coloured, with darker stripes; solitary. Summer. *l.* small, crowded, ovate-deltoid, sub-acute. Eastern Persia, 1889. A perennial, of very dwarf, tufted habit. (R. G. 1892, t. 1365, f. 5-8.)

G. scorzonerifolia (Scorzonera-leaved). A synonym or form of *G. perfoliata*.

GYRANDRA (of Wallich). A synonym of **Daphniphyllum** (which *see*).

GYROMIA. A synonym of **Medeola** (which *see*).

GYROSTACHYS. A synonym of **Spiranthes** (which *see*).

GYROTHECA. A synonym of **Lachnanthes** (which *see*).

HABENARIA. SYN. *Sieberia*. Including *Aopla*, *Neotinea*, *Nigritella*, and *Peristylis*. Flowers spicate or racemose; sepals sub-equal, free or cohering towards the base; petals often smaller, sometimes deeply two-lobed; lip continuous and often very shortly connate with the column, having a short or long spur, and a spreading or pendulous, undivided or three- to five-lobed lamina, the lateral lobes sometimes pectinate-fringed or ciliated; column very short. To the species described on p. 107, Vol. II., the following should be added. *H. albida*, *H. bifolia*, *H. conopsea*, *H. intacta*, and *H. viridis* (Frog Orchis) are British species.

The new introductions which in recent years have been made to this somewhat neglected genus of plants have proved interesting, showy, and desirable. Such kinds as *H. carnea*, *H. c. nivosa*, *H. pusilla*, and the large pure white *H. Susannæ*, are suitable for stove-house culture. They are deciduous and tuberous-rooted. Like most other tuberous-rooted stove-plants, they must have careful attention while in the resting state, and they must not, under any consideration, be allowed to shrivel through lack of sufficient moisture, but enough only must be given to maintain them in a plump condition.

The pots used should be as small as possible. First secure the drainage by placing a large crock over the hole at the base, then add sufficient broken crocks to raise the crown of the tuber to within ½in. of the rim. Next fill to about one-half the depth of the tuber with small, clean crocks, on which should be placed a thin layer of sphagnum. The remaining space should be filled, so that the tuber is just covered, with the following compost: One half should consist of good fibrous peat, loam, and chopped sphagnum in equal proportions, and the other of finely-broken crocks and a liberal sprinkling of rough silver-sand. The whole should be thoroughly mixed before using. When potting has been done, the plants should be placed in a light position in the stove, and be kept sufficiently near the glass to prevent them from being drawn. They should then be freely sprinkled with a fine-rose can, using slightly

Habenaria—*continued.*

chilled water. As growth advances, the plants will require more pot-room. This should be done without disturbing the existing potting compost more than is really necessary; one shift should be sufficient for the season. Large "sixties" will be found ample for the small-tubered kinds, but "forty-eights" will be necessary for the larger-growing ones. For large pots the potting compost should not be so finely broken as when the smaller sizes are used. The tubers require only a moderate amount of water at the roots until they get into full growth; then a liberal supply must be given, and every inducement given to encourage their development by atmospheric moisture; slight overhead syringings will be found beneficial in bright weather. Care must be taken to shade the plants from the bright

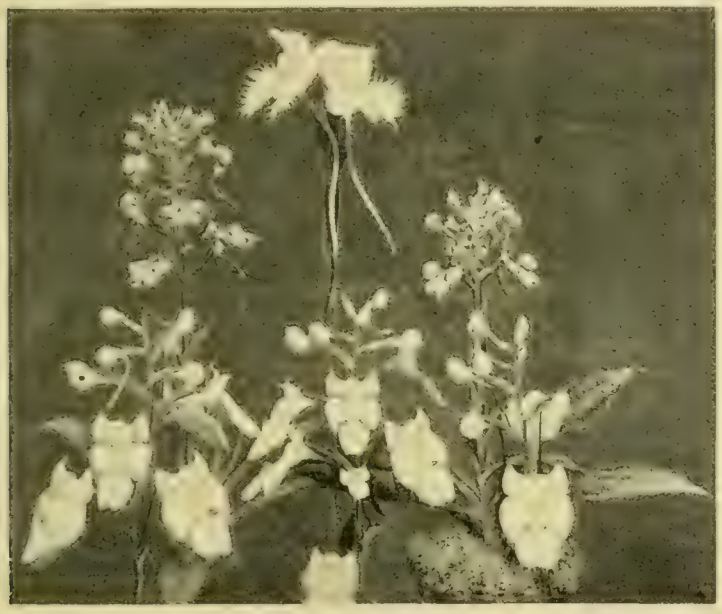

FIG. 439. HABENARIAS: 1, H. PUSILLA; 2, H. SUSANNÆ; 3, H. CARNEA.

scorching rays of the sun. Observation must be constantly kept for such pests as Thrips and Red Spider, which attack the leaves and centres of the growths, and quickly disfigure the plants. Where these are found, the house should be fumigated, and the necessary steps taken for their destruction. When the flowering season is over, the plants should be allowed to die down or dry off naturally, and stood on a dry shelf near the light, where they may be kept under observation until the potting season comes round. The stock may be increased by dividing the tubers at the time of potting.

H. Bonatea (Bonatea). *fl.* pale green and white, of singular form; of the three anterior lobes of the lip the lateral ones are somewhat tubular, while the central one is even more so, forming a sort of nectary. South Africa, 1895. Greenhouse. SYN. *Bonatea speciosa* (G. C. 1895, i., p. 743, f. 112).

H. candida. The correct name is *H. subpubens.*

H. carnea (flesh-coloured).* *fl.* larger than those of *H. pusilla*; helmet-shaped portion of a beautiful pink, the remainder white; spur 1½in. long; scape erect, three- to five-flowered. *l.* small, dark green, thickly spotted with white. Singapore, 1891. A handsome, stove species. See Fig. 439. (G. C. 1891, x., p. 729, f. 105; G. & F. 1891, iv., p. 475, f. 76; J. H. 1893, xxvii., p. 283, f. 40.) There is a variety, *nivosa* (SYN. *alba*, Gn. 1896, i., p. 182, t. 1005), with white flowers. 1894.

H. ciliaris albiflora (white-flowered). A variety with creamy-white flowers. Canada.

H. cinnabarina (cinnabar-red). *fl.* orange-red, small, disposed in a dense cluster; scape erect, 6in. high. *l.* erect, linear, 6in. long. Madagascar, 1893. Stove.

H. conopsea (canopied). Fragrant Habenaria. *fl.* reddish or rarely white, small, very numerous, sweet-scented, lip three-

Habenaria—*continued.*

lobed; spike oblong or cylindrical. All summer. Stem 1ft. to 2ft. high, with linear or narrow-lanceolate leaves. Tubers palmate. Europe (Britain), &c. SYNS. *Gymnadenia conopsea, Orchis conopsea.*

H. decipiens (deceptive). *fl.* 1½in. long, with a pendent spur 4in. to 5in. long; lip much longer than the green sepals, cuneate, three-lobed; pedicels long; scapes erect, few-flowered. September to November. *l.* radical, Plantain-like. Western Ghats of India, prior to 1891. Cool-house. SYN. *H. longecalcarata* (B. M. 7223).

H. Ellioti (Elliot's). *fl.* green, with a long, thin spur. *l.* bright green, lanceolate, luxuriantly produced on a strong stem. Madagascar, 1897. Stove.

H. Elwesii (Elwes'). *fl.* greenish-yellow, 2in. long; petals bifurcate from the base; lip highly glabrous, the limb divided into three filiform segments; raceme lax-flowered. *l.* erect. Nilghiri Hills, 1896. More curious than beautiful. (B. M. 7478.)

H. foliosa (leafy).* *fl.* purple, numerous in an ovate-oblong spike about 8in. long; sepals erect, ovate, obtuse; petals similar but smaller and straighter; lip pendent, very large, three-lobed. May. *l.* unspotted, oblong; lower ones obtuse. *h.* 1½ft. to 2½ft. (B. M. 5074; B. R. 1701.)

H. gigantea. The correct name is *H. Susannæ.*

H. incisa (cut). *fl.* rich purple, small, fragrant, thickly set in oblong, terminal racemes. June. *l.*, cauline ones obtusely lanceolate, deep green. *h.* 1ft. to 1½ft. North America, 1826. SYN. *Platanthera incisa.*

H. longecalcarata (long-spurred). A synonym of *H. decipiens.*

H. macrantha (large-flowered). *fl.*, sepals and petals dark brown; lip purplish-lilac, marked with darker streaks and freckles, roundish; spike six- to ten-flowered. *l.* sheathing, three-nerved. Sierra Leone, 1886. Stove. SYN. *Gymnadenia macrantha.*

H. margaritacea (pearly-white). *fl.* white, in a terminal, somewhat dense raceme. Summer. *l.* oblong, acuminate, dark green, blotched and spotted with white. *h.* 1ft. South America. Stove.

H. militaris (military). A synonym of *H. pusilla.*

H. orbiculata is a form of *H. Hookeri.*

H. pusilla (small).* *fl.*, lateral sepals green, oblong, acute, reflexed and revolute; petals green, strongly adhering to the green dorsal sepal, forming a cucullate-pavicular helmet; lip scarlet, the side lobes oblong-dolabriform, spreading, the front lobe bifid; raceme lax. *l.* linear, acute, 3in. to 9in. long, ¼in. broad. *h.* 1ft. or more. Cochin China, 1826. Stove. See Fig. 439. SYN. *H. militaris* (Gn. 1893, xliii., t. 908; J. H. 1888, xvi., p. 25; W. O. A. vi. 281).

H. reniformis (kidney-shaped). *fl.* green, about ¼in. in diameter; spike 3in. to 6in. long, four- to six-flowered. *l.* one or two, radical, ½in. to §in. long, fleshy, orbicular or oblong. India, &c. Stove. SYNS. *Aopla reniformis, Herminium reniforme.*

H. subpubens (slightly downy). The correct name of *H. candida.*

H. Susannæ (Susanna's).* See Fig. 439. The correct name of *H. gigantea.*

H. S. sumatrana (Sumatran). *fl.* white, large. Sumatra, 1893.

A number of other species are in cultivation in botanical collections, but they have little or no horticultural value.

HABIT. This usually denotes the general appearance of a plant; *e.g.*, compact, straggling, climbing, &c. It is also and less commonly employed to suggest fruitfulness.

HABRANTHUS PUNCTATUS. A form of **Hippeastrum Bagnoldi** (which *see*).

HÆMANTHUS. African Tulip. Including *Nerissa.* According to J. G. Baker, this genus embraces nearly forty species, natives of Tropical and South Africa and Socotra. Flowers red or white, densely umbellate; perianth erect, the tube almost cylindrical, the segments equal, linear or lanceolate, spreading or permanently ascending; stamens inserted at the throat of the perianth tube; filaments filiform, often longer than the segments; anthers small; spathe valves more than two, erect or spreading, membranous; peduncle stout, solid. Leaves broad, obtuse, thin or fleshy. Bulb tunicated. To the species described on p. 108, Vol. II., the following should be added:

Hæmanthus—*continued.*

H. abyssinicus is identical with *H. multiflorus.*

H. albiflos is the correct name of *H. virescens albiflos*, and the plant described as *H. virescens* is *H. a. pubescens.*

H. Allisoni (Allison's). *fl.* pure white, in very large umbels. Transvaal, 1894. This species has the habit of *H. coccineus.* SYN. *H. candidus.*

H. Baurii (Rev. R. Baur's).* *fl.* white, a little shorter than the bracts; bracts white, ciliated, broadly obovate; umbel dense, 2in. in diameter, sub-sessile between the leaves. November. *l.* two, sub-orbicular, dark green, 5in. to 6in. long and broad, spreading on the ground. Bulb 3in. to 4in. in diameter. Kaffraria, 1886. A handsome, dwarf, greenhouse species. (B. M. 6875.)

H. candidus (white). A synonym of *H. Allisoni.*

H. carneus (flesh-coloured). *fl.* in a dense, globose umbel 2in. to 3in. in diameter; perianth pink, rarely white, ½in. long; peduncle 6in. to 12in. long, mottled with purple. June to August. *l.* two, developed after the flowers, obtuse, 4in. to 6in. long, softly hairy. Bulb 2in. to 3in. in diameter. Cape Colony, 1819. (B. M. 3373; B. R. 509.)

H. Clarkei (Clarke's). A garden hybrid between *H. albiflos* and *H. coccineus.*

H. coccineus (scarlet).* *fl.* in a dense, globose umbel 2in. to 3in. in diameter; perianth bright red, 1in. long; peduncle 6in. to 9in. long, minutely spotted with reddish-brown. September. *l.* two, fully developed in winter, lingulate, sub-erect, 1½ft. to 2ft. long, 6in. to 8in. broad. Cape Colony, 1731. (B. M. 1075; L. B. C. 240.)

H. insignis is a variety of *H. magnificus.*

H. Kalbreyeri is identical with *H. multiflorus.*

H. Lindeni (Linden's). *fl.* rosy-scarlet, about 2in. in diameter, about a hundred disposed in a very large head; scape 1½ft. high. *l.* large, clear green. Congo, 1890. This species is closely related to *H. cinnabarinus.* (G. C. 1890, viii., p. 436, f. 85; I. H. xxxvii., p. 89, t. 112.)

H. magnificus (magnificent).* *fl.*, perianth bright scarlet, 1in. long; umbel globose, very dense, sometimes 5in. to 6in. in diameter; peduncle above 1ft. long. July. *l.*, produced ones six to eight, oblong, bright green, undulated. Stem 1ft. to 2ft. high, spotted with reddish-brown. Natal, 1838. SYN. *H. Rouperi* (F. M. 1875, t. 148).

H. m. insignis (remarkable). The correct name of *H. insignis.*

H. m. superbus (superb).* *l.* five or six, narrower than in the type, contemporary with the flowers in spring.

H. multiflorus superbus (superb).* A brilliant-coloured and improved form of the type. 1898.

H. Nolsoni (Nelson's).* *fl.* red, crowded in a globose head 3in. across; scape 1ft. long, hairy. *l.* sessile, oblong, 1ft. long, 4in. broad, downy above, glabrous beneath. Bulb red, oblong, compressed. Transvaal, 1893.

H. rotundifolius (round-leaved). *fl.* in a dense, compressed umbel 1½in. to 2in. in diameter; perianth pale red, 1in. long; peduncle bright red, 6in. long. May. *l.* two, spreading, sub-orbicular, 5in. to 6in. long and broad. Bulb 3in. to 4in. in diameter. Cape Colony, 1790. (B. M. 1618.)

H. Rouperi (Rouper's). A synonym of *H. magnificus.*

H. tenuiflorus (slender-flowered). A synonym of *H. multiflorus.*

H. toxicarius (poisonous). A synonym of *Buphane disticha.*

H. Arnottii and *H. Cooperi* have also been introduced.

HÆMARIA. Sepals equal, free, the dorsal one erect, connivent or coherent with the petals in a hood, the lateral ones spreading; lip affixed to the base of the short column. To the species described on p. 108, Vol. II., the following should be added:

H. argyroneura (silvery-nerved). A synonym of *Dossinia marmorata.*

H. Dawsoniana (Dawson's). The correct name of the plant described on p. 81, Vol. I., as *Anœctochilus Dawsonianus.* (F. d. S., t. 1830.)

H. discolor Ordiana (Ord's). This closely resembles *H. Dawsoniana*, but the leaves are of a vivid green, with golden veins. Malaya. SYN. *Goodyera Ordiana.*

H. Otletæ (Mme. Otlet's).* *fl.* white, with a yellow-tinted, one-sided lip, disposed in a lax spike. *l.* dark olive-green, with coppery veins, lanceolate, acute. *h.* 6in. to 10in. Tonkin, 1891. A beautiful plant. (I. H. xxxviii., t. 124.)

HÆMATORCHIS. A synonym of **Galeola** (which *see*).

HÆMOCHARIS. A synonym of **Laplacea** (which *see*).

HÆNKEA (of Ruiz and Pavon). *See* **Maytenus** and **Schœpfia.**

HÆNSELERA. A synonym of **Physospermum** (which *see*).

HAGEA, or HAGÆA. A synonym of **Polycarpæa** (which *see*).

HAG TAPER. *See* **Verbascum Thapsus.**

HAIR ORCHID. *See* **Trichosma suavis.**

HAKEA. To the species described on p. 109, Vol. II., the following should be added:

H. gibbosa (swollen). *fl.* white, small, in sessile, axillary clusters; pedicels short, densely villous. May. *fr.* about 1in. in diameter, with a short beak. *l.* terete, entire, smooth, rigid, sharp-pointed, 1in. to 3in. long. *h.* several feet. 1790. SYN. *H. pubescens.*

H. laurina (Laurel-like).* *fl.* rosy-lilac, in dense, globular, sessile, axillary clusters; pedicels about ¼in. long. Summer. *l.* narrowly elliptic-oblong or oblong-lanceolate, long-petiolate, 4in. to 6in. long, and (as well as the branches) hoary-tomentose or glabrous. *h.* 10ft. to 30ft. 1830. A handsome shrub. (B. M. 7127; G. C. n. s., xxv., p. 149.)

H. pubescens (downy). A synonym of *H. gibbosa.*

H. scoparia (Broom-like). A form of *H. sulcata.*

HALESIA. To the species described on pp. 109-10, Vol. II., the following variety should be added:

H. tetraptera Meehani (Meehan's). A seedling variety, differing from the type in having smaller and shorter-stalked flowers, and thicker, pale, distinctly rugose leaves. 1892. (G. & F. 1892, v., p. 534, f. 91.)

HALF-HARDY PLANTS. A term applied to such subjects as require protection during winter. They are to be found in all sections—annual, biennial, and perennial.

HALIA VAUARIA. *See* **V-Moth.**

HALIMODENDRON. To the species described on p. 110, Vol. II., the following variety should be added:

H. argenteum flore-purpureum (purple-flowered). This variety differs from the type in having deep rosy-purple flowers. 1894.

HALODENDRON (of Thouars). A synonym of **Avicennia** (which *see*).

HALOXYLON (from *hals*, salt, and *xylon*, wood; in allusion to the salt deserts in which some of the plants are found). ORD. *Chenopodiaceæ.* A genus embracing eight or ten species of greenhouse or hardy shrubs or small trees, natives of Europe, North Africa, Western and Central Asia, and India, and only distinguished from *Salsola* by their articulated branches and monadelphous filaments. *H. Ammodendron*, the only species introduced, is a hardy shrub, found in sandy deserts, and should be treated accordingly.

H. Ammodendron (Ammodendron). *fl.* yellow, small, produced in abundance, loosely spicate. Stems leafless, woody, pale greenish. Trunk (in its native places, Turkestan, &c.) thick. 1889. SYN. *Anabasis Ammodendron.*

HAMAMELIS. The Chinese and Japanese species of *Hamamelis* may be readily increased by grafting in February on stocks of the North American *H. virginica*, which should be about the thickness of a lead-pencil, and established in pots before grafting takes place. The scions should be about 3in. or 4in. long, and taken from firm, well-ripened shoots. After they have been properly secured to the stocks, place them in a close case with a temperature of 55deg. to 60deg., and if slightly syringed overhead occasionally a union will be accelerated. When a few inches of growth have been completed, take them out of the cases, stand upon the side stages of the house, and keep close to the glass to prevent spindly growth. Each plant should be tied to a small stake, and later on planted out in the open ground. The species alluded to above should always be planted in a sunny position, and the soil most favourable to good growth is a well-drained loam, enriched with leaf-mould and a little peat, and on no account should they be planted in soil retentive of moisture. As the flowers are borne on the leafless branches in the early year, a background of suitable evergreens should be provided, in order to set off the flowers to the best possible advantage.

To the species described on pp. 110-11, Vol. II., the following should be added:

H. arborea is a form of *H. japonica*, which is a good species.

H. mollis (soft). *fl.* light yellow, resembling those of *H. arborea.* *l.* 4in. to 5in. long, 2in. to 3in. broad, densely clothed beneath with a felt-like mass of stellate hairs (thus differing from all other cultivated species of this genus). *h.* 9ft. to 30ft. China, 1898.

H. virginiana is the correct name of *H. virginica.*

H. Zuccariniana (Zuccarini's). A form of *H. japonica.*

HAMBURGH PARSLEY. *See* **Parsley.**

HAMELIA. *Duhamelia* is synonymous with this genus.

HAMELINIA. A synonym of **Astelia** (which *see*).

HAMILTONIA. Probably both *H. scabra* and *H. spectabilis* are merely forms of *H. suaveolens.*

HAMILTONIA (of Muehlenbeck). A synonym of **Pyrularia** (which *see*).

HAPALE. A synonym of **Hapaline** (which *see*).

HAPALINE (derivation uncertain). SYN. *Hapale.* ORD. *Aroideæ.* A small genus (two species) of small, slender, stove herbs, natives of Birma and the Malayan Peninsula, allied to *Colocasia. H. Brownei,* a species with greenish-white spadix and spathe (B. M. 7325), has been introduced, but it is not likely to be grown much outside botanical collections.

HAPLOCARPHA (from *haploos,* single, and *karphe,* chaff; in allusion to the one-rowed, chaffy pappus). ORD. *Compositæ.* A genus comprising four species of greenhouse or half-hardy, almost stemless, perennial herbs, natives of South Africa, one extending into tropical regions. Flower-heads yellow, rather large, solitary, heterogamous, radiate; involucre hemispherical, the bracts in many series; receptacle flat or convex, naked or slightly fimbrilliferous; ray florets ligulate, spreading, entire or minutely three-toothed; achenes turbinate. Leaves radical, entire or toothed, cano-tomentose or woolly beneath. *H. Leichtlinii,* the only species in cultivation, is a showy, free-flowering plant, requiring protection during the winter. It thrives in any fairly good soil. From the crown are produced numerous short shoots, which all flower; and by making cuttings of these the plant may be propagated.

H. Leichtlinii (Leichtlin's).* *fl.-heads* 2in. to 2½in. in diameter; involucral scales free, the outer ones cobwebby-tomentose, the inner ones tipped dull purple; ray florets stained purple beneath, the disk of a deeper yellow; scape 1ft. long. *l.* 6in. to 12in. long, 2in. to 2½in. broad, lyrate-pinnatisect. 1883. SYN. *Gorteria acaulis* (of gardens).

HAPLOCHILUS. Included under **Zeuxina** (which *see*).

HAPLOPAPPUS [according to the "Index Kewensis," *Aplopappus* is the correct spelling]. Including *Sideranthus.* To the species described on p. 112, Vol. II., the following should be added:

H. ericoides (Erica-like). *fl.-heads* ¼in. long, having three to five short rays, very numerous, paniculate. *l.* all filiform or nearly terete, excessively numerous and axillary-fascicled; cauline ones only ½in. and those of the dense fascicles ¾in. long. *h.* 2ft. to 5ft. California. Plant fastigiately much-branched.

HAPLOPTERIS. *See* **Vittaria.**

HARDENBERGIA. To the species described on p. 112, Vol. II., the following variety should be added:

H. monophylla cærulea (blue). A variety with blue flowers. 1888.

HAREBELL, AUSTRALIAN. *See* **Wahlenbergia gracilis.**

HARES AND RABBITS. These at times are very destructive to trees, especially in severe winters, when food is scarce. Again, it is thought that the bark is taken as an aid to digestion. From whatever cause barking occurs, it is undesirable, as it exposes the trees to the attacks of certain wound-fungi. To guard against barking by animals, trees should be treated with Ahlbottin's Composition, which will render them impervious to the attacks of Hares, Rabbits, or even of deer. This preparation is of a thick, greasy consistency, and is not washed off by even heavy rains. Other points in its favour are that it is non-poisonous, and that it may be applied to the most delicately-barked trees.

HARPALUS RUFICORNIS. This is one of the Beetles belonging to the interesting and numerous group *Geodephaga* (Ground Beetles). It is noteworthy from the fact that it is one of the few species which at times forsake a diet of flesh for one of vegetables. Of late years this insect has proved very troublesome in gardens

Harpalus Ruficornis—*continued.*

where Strawberries are grown, showing a marked partiality for the ripe fruit. Like the majority of the Ground Beetles, it is chiefly nocturnal in its habits, lying concealed during the day under stones, &c., in the vicinity of its feeding-ground. Frequently, however, as is the case with several other members of the group, it may be found running in bright sunshine.

In size, *Harpalus ruficornis* is about ½in. (12mm. to 15mm.). It is a flat, oblong, black insect, though the elytra are covered with a greyish down, the general sombre colouring being relieved only by the red antennæ and legs. The larval and pupal states are passed beneath the surface of the soil.

The Beetle is most numerous where litter is employed as a protection to the fruit from heavy rains, as this affords the pest safe harbourage during the day. Where the insect is troublesome, the litter should be periodically examined during the day, and the perfect insects collected and destroyed. To trap these pests is somewhat difficult, the most successful method being that suggested by Messrs. Laxton in their manual—to let into the ground-level in spring a number of cheap pudding basins, baiting them with "lights and sugar and water." Disused condensed milk-tins have also been similarly employed, and the crops thus saved from destruction.

HARPALYCE (of Don). Included under **Prenanthes** (which *see*).

HARTMANNIA. Included under **Œnothera** (which *see*).

HARTWEGIA (of Nees). A synonym of **Chlorophytum** (which *see*).

HASSELTIA. A synonym of **Kickxia** (which *see*).

HATCHET VETCH. *See* **Securigera Coronilla.**

HAWKFLIES. *See* **Syrphus.**

HAWORTHIA. Flowers whitish, ribbed with green or reddish-brown; perianth oblong-cylindrical, with a straight tube and a bilabiate limb of six sub-equal, oblong segments; stamens six, hypogynous. To the species described on p. 114, Vol. II., the following should be added:

H. columnaris (columnar). *fl.* ⅝in. long; raceme simple, nearly 1ft. long; peduncle simple, 6in. long. *l.* about thirty in a rosette, multifarious, obovate, cuneate, all ascending, not recurved, ¾in. to 1in. long, ¼in. thick, minutely cuspidate. Leafy stem short. 1884.

H. distincta (distinct). A synonym of *H. venosa.*

H. pilifera (ball-bearing). *fl.* ⅜in. long; raceme lax, simple, 6in. long; peduncle simple, 6in. long. *l.* twenty to thirty in a rosette, multifarious, ovate-oblong, 1in. long, ¼in. thick, pale green, pellucid, rounded on the back, with a large awn. 1860. (Ref. B., t. 234.)

H. Radula (Radula). *fl.* ⅜in. long; raceme very lax; peduncle simple or branched, 6in. to 12in. long. May. *l.* thirty to forty crowded in a multifarious rosette 5in. to 6in. across, lanceolate-deltoid, very acuminate, recurved. Leafy stem short. 1805.

H. venosa (veined). *fl.* ⅝in. long; raceme lax, simple, 6in. to 9in. long; peduncle simple, 6in. long. *l.* twelve to fifteen in a rosette, multifarious, lanceolate-deltoid, rather recurved, 2½in. to 3in. long, dull green with a purplish tinge, cuspidate; margins minutely denticulate. Re-introduced 1875. SYN. *H. distincta* (G. C. 1876, vi., p. 130, f. 30).

H. vittata (striped). *fl.* ⅝in. to ¾in. long; raceme simple, dense upwards; peduncle simple, stiff, about ½in. long. *l.* twenty to thirty in a dense rosette, multifarious, oblong-lanceolate, very acuminate, 1½in. to 1¾in. long, ¼in. thick, with about five short, vertical stripes and a long, pellucid awn. 1860. (Ref. B., t. 263.)

H. xiphiophylla (Xiphion-leaved). *fl.* about ⅝in. long; raceme lax, cernuous, 3in. to 4in. long; peduncle 6in. long. *l.* fifty or more in a dense, sessile rosette, lanceolate, 2in. long, pale green, acutely keeled on the back, tapering to a pellucid awn. 1895. (B. M. 7505.)

The following species have also been introduced: *H. affinis, H. bilineata, H. Bolusii, H. Cooperi, H. glauca, H. Greenii, H. icosiphylla, H. minima, H. Peacockii, H. polyphylla, H. Tisleyi.*

HAWTHORN, CHINESE. *See* **Photinia serrulata.**

HAWTHORN, WINTER. *See* **Aponogeton distachyon.**

HAYLOCKIA (named in honour of Haylock, Dr. Herbert's gardener). ORD. *Amaryllideæ*. A monotypic genus. The species is a small, half-hardy, bulbous plant, which thrives in a soil consisting of sandy loam with a slight intermixture of peat and leaf-mould, and is propagated by offsets.

H. pusilla (small). *fl.* solitary; perianth erect, regular, the tube tinged with green, 1in. to 2in. long, very slender, the limb whitish, sometimes tinged with red outside, funnel-shaped, 1in. to 1¼in. long. March. *l.* narrow-linear, spreading, developed in winter. Bulb 1in. in diameter. Buenos Ayres, 1829 and 1899. (B. R. 1371.)

HAYNALDIA THAPSOIDEA. According to the "Index Kewensis," this is the correct name of **Lobelia thapsoidea** (which *see*).

HAZEL-BUD MITE (*Phytoptus avellanæ*). Allied to the Currant-Bud Mite already described is the pest known by the name here adopted. Though its ravages are chiefly confined to the Hazel, yet at times it proves injurious to the Filbert. The symptoms of attack and life-history are identical with those detailed under **Currant-Bud Mite.** In gardens this pest is not difficult to control, as the deformed buds may readily be seen early in spring, and as the pruning of Filberts usually takes place in March or April all that the gardener has to do is to remove the infested buds and burn them. *See* **Currant-Bud Mite.**

HEAD. A term applied specifically to the cluster of flowers in *Compositæ* and *Dipsaceæ*; and generally to other compact forms of inflorescence.

HEADACHE-TREE. *See* **Premna integrifolia.**

HEART AND DART MOTH. *See* **Turnip Moths.**

HEATING. The new horizontal tubular boiler (Fig. 440) of the Thames Bank Iron Company is finding considerable favour amongst market growers, for its economy, reliability, and ease with which any damaged or leaking part may be replaced with little loss of time. In fact, it has proved so excellent in every case when

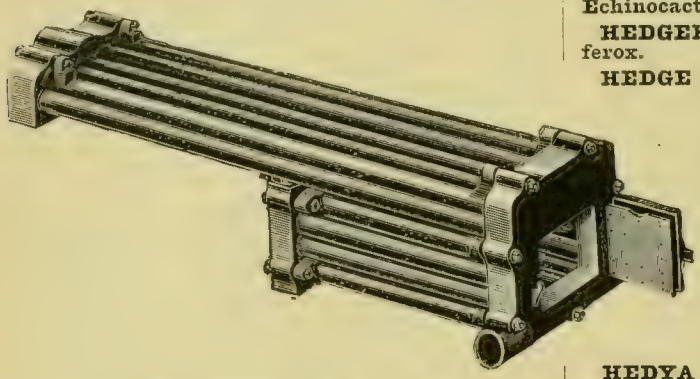

FIG. 440. HORIZONTAL TUBULAR BOILER.

given a fair trial that market growers are employing it in preference to most other boilers.

HEBEANDRA. A synonym of **Monnina** (which *see*).

HEBECOCCA. A synonym of **Omphalea** (which *see*).

HEBELIA. A synonym of **Tofieldia** (which *see*).

HEBENSTRETIA. To the species described on p. 119, Vol. II., the following should be added:

H. comosa (tufted). *fl.* orange, disposed in a terminal, dense, elongated spike. *l.* dilated, oblong-lanceolate, obtuse, 1in. to 1¼in. long, sessile, glabrous, toothed, especially towards the apex. Stems erect, terete, glabrous. Greenhouse or half-hardy perennial.

H. c. serratifolia (serrated-leaved). *fl.* white, marked with a blood-red spot. *l.* lanceolate, serrated. 1890. (R. G. 1890, p. 191, f. 46.)

H. integrifolia (SYN. *H. tenuifolia*) is a form of *H. dentata.*

Hebenstretia—*continued.*

H. scabra (scabrous). *fl.* white, approximating, in terminal spikes scarcely 1in. long. June and July. *l.* linear; lower ones longer, slightly denticulate; upper ones shorter and entire; all glabrous or scarcely puberulous and slightly obtuse. Stems erect, branched, shrubby below, pubescent. *h.* 1ft. 1824.

H. tenuifolia (slender-leaved). A synonym of *H. integrifolia.*

HEBERDENIA. Included under **Myrsine** (which *see*). *H. excelsa* is a synonym of *M. Heberdenia.*

HECATEA. A synonym of **Omphalea** (which *see*).

HECHTIA. The species are natives of Mexico and Texas. Flowers sub-diœcious, whitish; peduncle produced from the axis of one of the outer leaves of the rosette. Leaves as in *Dyckia.*

H. Besseriana (Besser's). A garden synonym of *H. stenopetala.*

H. Elemeetii (Elemeet's). A synonym of *Rhodostachys andina.*

H. glomerata (clustered). The correct name of *H. Ghiesbreghtii* (I. H. 378).

H. Glymiana (Glym's). A garden synonym of *Pitcairnia angustifolia.*

H. pitcairniæfolia (Pitcairnia-leaved). A synonym of *Rhodostachys pitcairniæfolia.*

H. stenopetala (narrow-petaled). The correct name of *H. cordylinoides.* SYN. *H. Besseriana* (of gardens).

HEDERA. To the species and varieties described on pp. 120-2, Vol. II., the following should be added. One or two species formerly classed hereunder are now referred to **Oreopanax,** &c.

H. arborea (tree-like). A synonym of *Dendropanax arboreum.*

H. glomerulata (in small clusters). A synonym of *Brassaiopsis speciosa.*

H. Helix maderensis variegata (Madeira, variegated). *l.* deep green, with broad, silvery variegation. 1888. A fine form.

H. H. tesselata (tesselated).* *l.* bright green, with reticulations of yellowish-green; young ones very highly coloured. 1893. A handsome Ivy.

HEDERACEOUS. Ivy-like.

HEDGEHOG CACTUS. A popular name for **Echinocactus.**

HEDGEHOG HOLLY. *See* **Ilex Aquifolium ferox.**

HEDGE MUSTARD. *See also* **Sisymbrium.**

HEDGE NETTLE. *See* **Stachys.**

HEDRÆANTHUS (**EDRAIANTHUS**). Included under **Wahlenbergia** (which *see*).

HEDWIGIA. Flowers small, in axillary panicles. Leaves alternate or nearly opposite, impari-pinnate; leaflets opposite, entire or serrated.

H. panamensis (Panama). The correct name of *H. balsamifera.*

HEDWIGIA (of Medicus). A synonym of **Commelina** (which *see*).

HEDYA OCELLANA. *See* **Pear—Insects** and **Tortricina.**

HEDYCHIUM. Flowers disposed in a terminal thyrse; calyx tubular, three-toothed; corolla tube elongated, the lobes narrow, equal, spreading. Stems erect, leafy, usually tall. To the species described on p. 123, Vol. II., the following should be added:

H. acuminatum is a variety of *H. spicatum.*

H. chrysoleucum is a variety of *H. coronarium.*

H. coccineum angustifolium (scarlet, narrow-leaved). The correct name of *H. angustifolium.*

H. ellipticum (elliptic). *fl.* white, with an orange-yellow filament; corolla tube 2in. long; segments 1in. long; staminodes rather shorter; spike very dense, 3in. to 4in. long. August. *l.* oblong, 6in. to 12in. long. Himalayas, 1804. (L. B. C. 1831; R. G. 1201.)

H. Elwesii (Elwes').* *fl.* of a rich golden-yellow, with a bright red filament; corolla tube 2½in. long, the segments 1in. long; staminodes resembling the segments; spike dense, 6in. long. *l.* oblong, 1ft. or more in length, nearly glabrous beneath. Khasia Hills, 1894. Allied to *H. coronarium.*

H. flavum is a variety of *H. coronarium.*

Hedychium—*continued.*

H. peregrinum (foreign). *fl.*, calyx 1¼in. long; corolla tube slender, 2¼in. long, the petals light yellowish-green, very narrow, 1½in. long, the lip white, 1½in. long; outer bracts pale brown; spike 6in. long. *l.*, lower ones 4in. to 8in. long, elliptic, acute or acuminate, rounded at base; upper ones 1ft. to 1¼ft. long, lanceolate or elliptic-lanceolate. Stem 3ft. to 4ft. high, leafy. Madagascar, 1883.

H. Wilkeanum (Wilke's). A garden hybrid between *H. coronarium* and *H. Gardnerianum*. 1894.

HEDYSARUM. To the species described on p. 123, Vol. II., the following should be added. Several plants formerly included hereunder are now referred to **Desmodium.**

H. Crista-galli (Cock's-spur). A synonym of *Onobrychis sativa.*

H. microcalyx (small-calyxed). *fl.* bright violet-red, shortly pedicellate, 1in. long; calyx small, five-toothed; standard narrowly oblong-obovate, emarginate, equalling the narrow-linear wings; racemes axillary, sometimes 1ft. long, many-flowered; peduncles very long. June. *l.* 1ft. long or less; pinnæ eight to ten pairs, ¾in. to 1¼in. long, opposite, petiolulate, oblong or ovate-oblong. Himalayas, 1837. A tall sub-shrub. (B. M. 6931.)

H. multijugum (many-paired).* *fl.* pale vermilion-pink, disposed in axillary, eight- to ten-flowered racemes, which are longer than the leaves. *l.*, leaflets twenty to forty, alternate, obovate or oblong, obtuse, silky-pilose beneath; petioles (and branches) silky-pilose. *h.* 2ft. to 5ft. South Mongolia, 1883. (R. G. 1122.)

H. Onobrychis (Onobrychis). A synonym of *Onobrychis sativa.*

H. tuberosum (tuberous). A synonym of *Pueraria tuberosa.*

HEKATEROSACHNE. A synonym of **Oplismenus** (which *see*).

HEKORIMA. A synonym of **Streptopus** (which *see*).

HELENIUM. Including *Amblyolepis.* To the species described on p. 124, Vol. II., the following should be added:

H. atropurpureum (dark purple). A variety of *H. nudiflorum.*

H. Bigelovii (Bigelow's). *fl.-heads* rich yellow, with brown disk. Late summer. *h.* 4ft. North America.

H. Bolanderi (Bolander's).* *fl.-heads* 2in. to 3in. in diameter; ray florets bright yellow, numerous; disk dark brown. June to August. *l.* ovate, obovate, or spathulate-lanceolate, entire, more or less decurrent. Stem 1ft. to 1½ft. high, leafless at apex and one-headed, or rarely branched and bearing two or three heads. North America, 1891. Perennial, of vigorous habit and very free-flowering. (R. H. 1891, p. 377, f. 93-4.)

H. grandiflorum (large-flowered).* *fl.-heads* larger, deeper in colour, and possessed of a blacker disk than those of *H. pumilum*, which the whole plant resembles. Perennial.

H. pumilum (dwarf). *fl.-heads* yellow; involucral scales spreading, lanceolate. August. *l.* oblong, nearly entire. *h.* 1ft. North America. Perennial.

H. setigerum (bristle-bearing). *fl.-heads* golden-yellow; rays almost 1in. long, three- to four-lobed. All the summer. *l.* membranous, bright green, entire; radical ones oblong-spathulate, with a long, tapering base; cauline ones oblong or ovate, acuminate, rounded or half-clasping at base. *h.* 1ft. or more. Texas. Annual.

HELIACZEUS POPULI. *See* **Populus—Insect Pests.**

HELIANTHEMUM. Holly Rose. *H. Tuberaria* (of B. M.) is a synonym of *H. globulariæfolium.* These evergreen shrubs are extremely valuable as being amongst the comparatively few subjects which will flower profusely upon dry, hot, sandy soils. The brilliant flowers open in bright sunshine, and are of good size, but of no use for cutting. They are short-lived upon the plant, but atone for this by their abundance and the time over which the flowering period extends. They are not rampant growers, and may be readily kept within bounds by slight prunings in spring. Besides the species referred to in Vol. II., there are several most desirable garden forms, both single and double, the best of the former including Bronze Queen, Pink Beauty, Salmon Queen, Snowflake, and Sulphur Gem; and of the latter, Mrs. C. W. Earle.

FIG. 441. VARIETIES OF PERENNIAL SUNFLOWERS.

HELIANTHUS. The perennial *Helianthus* (Fig. 441) are extremely useful plants, and may be effectively employed in beds, borders, or shrubberies. They are very robust, and may therefore be left to take care of themselves. Like the members of the genus generally, they are sun-lovers, and a sunny position in a well-drained, rich border is where they are seen to perfection. Periodically it is advisable to lift them and give the roots entirely fresh quarters, as, being somewhat gross feeders, they quickly take the nutriment out of the soil. When propagated by divisions, these may be made in either spring or autumn.

Of recent years some very fine garden varieties have been obtained, in some cases later as to flower than the species, and with the blossoms well above the foliage. The best kinds are Bouquet d'Or, H. G. Moon, Meteor, Miss Mellish, Queen Victoria, and Soleil d'Or. For fuller information on the perennial Sunflowers the reader is referred to a paper by Mr. D. Dewar, in the "Journal of the Royal Horticultural Society," vol. xv., part i., p. 26.

To the species described on pp. 126-7, Vol. II., the following should be added:

H. altissimus (tallest). A synonym of *H. giganteus.*

H. atrorubens (dark red), of Lamarck. A synonym of *H. lætiflorus.*

H. atrorubens (of Michaux). A synonym of *H. rigidus.*

H. Dammanni (Dammann's) and **H. D. sulphureus** (sulphur-coloured) have been described as garden hybrids between *H. argophyllus* and *H. annuus.* 1890.

Helianthus—*continued.*

H. debilis (weak). *fl.-heads* yellow; rays ½in. or more in length; disk ½in. or more in diameter. Summer. *l.* varying from ovate to deltoid or obscurely hastate, occasionally sub-cordate, 1in. to 3in. long, toothed, on slender petioles. Stems 1ft. to 3ft. high. 1895. Annual. (B. M. 7432.)

H. d. cucumerifolius (Cucumis-leaved). *fl.-heads*, rays fifteen to twenty, 1in. or more in length. *l.* triangular-ovate, wavy, coarsely toothed, sub-cordate at base. 1883.

H. decapetalus niger (black). A garden synonym of *H. divaricatus.*

H. d. sulphureus elatior (sulphur, tall). A garden synonym of *H. gigantens.*

H. divaricatus (divaricate). *fl.-heads*, rays orange-yellow, 1in. to 1½in. long, acute; disk yellow; bracts half as long as the rays. *l.* ovate, acuminate, stalked, opposite or decussate, usually appressed. Stems smooth or scabrous, green or purplish, 4ft. to 6ft. high, simple or branched near the summit. 1759. Perennial. SYN. *H. decapetalus niger* (of gardens).

H. doronicoides (Doronicum-like). *fl.-heads* mostly crowded, on short peduncles; bracts ciliated on back and margins. *l.* opposite or the upper ones alternate, ovate, tapering to both ends, sessile, serrated, rough. Stems 5ft. to 8ft. high, densely pubescent and scabrous. 1759. A rather coarse-growing perennial. SYN. *H. pubescens*, of Hooker (B. M. 2778).

H. giganteus (gigantic). *fl.-heads* deep yellow; rays 1in. to 1½in. long. *l.* lanceolate or oblong-lanceolate, more or less scabrous on both sides, tapering, shortly petiolate or sub-sessile, minutely serrate or denticulate or entire, 3in. to 5in. long. Stems hispidulous or scabrous, 10ft. to 12ft. high. 1714. Perennial. (B. M. 7555.) SYNS. *H. altissimus*, *H. decapetalus sulphureus elatior* (of gardens).

H. japonicus (Japanese). An erroneous name for *H. rigidus æstivus.*

H. lætiflorus (pretty-flowered).* *fl.-heads* yellow, usually several, rather shortly pedunculate; involucral bracts in two or three series; rays numerous, 2in. to 2½in. long. August. *l.* ovate-lanceolate, acuminate at both ends, 4in. to 10in. long, serrated. Stem stiff, 6ft. to 8ft. high, very leafy. 1810 and 1888. Perennial. Resembles tall forms of *H. rigidus.* SYN. *H. atrorubens* (of Lamarck).

H. lævigatus (smooth). *fl.-heads* bright yellow; rays six to eight, about 1in. long. *l.* opposite or the upper ones alternate, lanceolate, acute, entire. Stems 3ft. to 5ft. high, branched, deep purple. Perennial.

H. Ligeri (Liger's). A garden hybrid between *H. rigidus* and *H. lætiflorus.* 1897.

H. linearis (linear). A synonym of *Viguiera linearis.*

H. macrocarpus (large-fruited). A variety of *H. annuus.*

H. Maximiliani (Maximilian's).* *fl.-heads* bright golden-yellow, shortly pedunculate, terminal and axillary; rays often 1½in. long. October. *l.* almost all alternate, thickish, becoming rigid, very scabrous above, lanceolate, acute or acuminate at both ends, mostly sub-sessile, entire or sparingly denticulate. Stem stout, 7ft. to 12ft. high. Perennial. (R. H. 1895, p. 397.)

H. mollis cordatus (heart-shaped).* *fl.-heads* orange-yellow, large, borne on long, leafy peduncles. *l.* broadly ovate, acute. Stems 3ft. to 5ft. high, leafy, branching. 1889. A splendid variety. (G. & F. 1889, p. 136, f. 100.)

H. multiflorus (many-flowered). A variety of *H. decapetalus.* There are several garden forms, both single and double.

H. Nuttallii (Nuttall's). *fl.-heads* about the size of those of *H. giganteus*; bracts of the involucre naked or somewhat hirsute at base. *l.* lanceolate or the upper ones linear, 3in. to 6in. long, serrulated or entire. Stem usually simple, 2ft. to 4ft. high. Rocky Mountains (in wet soil), 1899.

H. occidentalis (Western). *fl.-heads* mostly solitary, on rather long peduncles; rays orange-yellow, ovate, 1in. long; disk yellow. *l.*, radical and lower ones ovate, obtuse, or lanceolate-oblong, coriaceous, entire or serrated. Stem slender, 2ft. to 3ft. high, branched, hispid. Perennial.

H. pubescens (of Hooker). A synonym of *H. doronicoides.*

H. rigidus. SYNS. *H. atrorubens* (of Michaux), *Viguiera rigida.* This species is often confused with *Harpalium rigidum.* There are a number of good varieties, including *æstivus* (*japonicus*), *elegans*, *grandiflorus*, *latifolius*, and the following:

H. r. semiplenus (half-double). *fl.* having two, three, or more rows of ray florets. A garden variety.

H. speciosus (showy). A synonym of *Tithonia speciosa.*

H. strumosus (measly). A synonym of *H. decapetalus.*

H. tubæformis (tube-like). A synonym of *Tithonia tubæformis.*

HELICHRYSUM. Including *Leucostemma*, *Pentataxis*, and *Swammerdamia.* **Aphelexis** (which *see*) is also included hereunder by modern authorities. To the species, &c., described on pp. 127-8, Vol. II., the following should be added:

H. brachyrhynchum (short-beaked). *fl.-heads* brilliant yellow, with a very dark, flat disk, 1in. across, solitary on long peduncles.

Helichrysum—*continued.*

June to September. *l.* alternate, linear-lanceolate, entire, whitish-woolly. *h.* 1ft. or more. Australia. Greenhouse.

H. devium (devious). *fl.-heads* several in a cyme, with a white involucre and a black disk; peduncles white. *l.* lanceolate, sessile, three-nerved, greyish-green, with white, wavy borders. Branches snowy-tomentose. *h.* 2ft. to 3ft. Madeira. Greenhouse shrub.

H. Gunnianum is synonymous with *H. scorpioides.* *H. Gunnii* is a true species, but not in cultivation.

H. Humboldtianum (Humboldt's). A synonym of *Helipterum Humboldtianum.*

H. humile (dwarf). The correct name of *Aphelexis humilis.* SYN. *Helipterum humile.*

H. Mannii is a form of *H. fœtidum.*

H. orientale (Eastern). *fl.-heads* bright yellow, small, globular, in terminal, branched corymbs. April to August. *l.* sessile, obtuse, entire, ovate-oblong or the upper ones lanceolate. Stems simple, erect. *h.* 1ft. to 1½ft. Crete, 1629. Plant whitish-woolly. This species is largely cultivated for Immortelles in the Mediterranean region.

H. sesamoides (Sesamum-like).* *fl.-heads* 1in. to 1½in. across, very handsome; involucre white, rosy, pale lemon, or mottled, lustrous, satiny. May. *l.* half-amplexicaul, subulate, rigid, glossy, keeled; lower ones loosely set, 1in. to 2in. long, flexuous; upper ones ½in. long. *h.* 1ft. to 2ft. South Africa, 1739. Greenhouse shrub. SYNS. *Aphelexis sesamoides*, *Helipterum sesamoides.*

H. s. fasciculatum (fascicled). *fl.-heads*, involucral scales pale lemon-yellow or primrose, the outer ones fulvous. SYNS. *Helipterum fasciculatum*, *Xeranthemum fasciculatum* (A. B. R. 242).

H. s. heterophyllum (variable-leaved). *fl.-heads*, involucral scales white, or the outermost ones brown-tipped. (A. B. R. 279, under name of *Xeranthemum fasciculatum* var.)

H. vestitum (clothed). Cape Everlasting. *fl.-heads* satiny-white, medium-sized. July to September. *l.* linear, terminating in a black point, whitish. Stems erect, somewhat woody. South Africa. The flowers are largely employed for funeral and ornamental purposes.

HELICODEA. Included under **Billbergia** (which *see*).

HELICONIA. To the species described on pp. 128-30, Vol. II., the following should be added. The plants described as *H. aureo-striata*, *H. illustris*, *H. i. rubricaulis*, and *H. Sanderi* are not Heliconias; but their family having yet to be determined, they are referred to here for convenience.

H. aurantiaca (orange). The correct name of *H. brevispatha.*

H. brasiliensis (Brazilian). *fl.* disposed in a flexuous thyrse; spathes scarlet, five- to eight-flowered; scape equalling the leaves. September. *l.* oblong, acute, cordate at base, glabrous, 2ft. long, paler beneath; petioles 2ft. to 3ft. long. *h.* 6ft. to 8ft. Brazil, 1820. (H. E. F., t. 190.)

H. brevispatha. The correct name is *H. aurantiaca.*

H. Choconiana (Chocon's). *fl.* yellowish, 2in. long; spathes scarlet, 2in. long; inflorescence sessile, terminal, deflexed. *l.* sessile on the sheaths, 6in. to 10in. long, 2in. broad, oblong-lanceolate, acuminate, shining green. *h.* 3ft. to 4ft. Guatemala, 1883. (G. & F. 1883, i., pp. 161-2, f. 31.)

H. illustris (remarkable).* *l.* ovate-lanceolate, the veins clearly marked in rose-pink. South Sea Islands, 1893. A beautiful foliage plant, of Musa-like habit.

H. i. rubricaulis (red-stemmed). *l.* 1½ft. to 2ft. long; nerves and petioles, as well as the stem, of a bright red. 1896. (R. H. 1896, p. 36.)

H. nitens (shining). *l.* obliquely oblong-ovate, bright satiny-green. Mexico, 1833. A small, neat species.

H. Sanderi (Sander's). This plant is closely allied to *H. illustris*, but is less robust and the variegation of the leaves consists of marbling instead of reticulation. New Guinea, 1899.

H. spectabilis (remarkable). *l.* green above, dull purple beneath, and having a red midrib. Tropical Asia, 1892. (I. H. xxxix., t. 156.)

H. triumphans is a form of *H. Bihai.*

H. viridis (green). *l.* 1½ft. to 2ft. long, 6in. broad, pale green. Polynesia, 1883. A fine plant, of graceful habit.

HELICOPHYLLUM (from *helix*, *helikos*, spiral, and *phyllon*, a leaf; alluding to the lateral segments of the older leaves. ORD. *Aroideæ.* A small genus (four or five species) of Western Asiatic, greenhouse or hardy, tuberous herbs. Flowers on an appendiculate spadix, the males and females remote, with subulate, neuter organs between; spadix much shorter than the spathe, slender or robust; spathe marcescent, the tube oblong, sub-ventricose, persistent, the lamina oblong, erect; peduncle much shorter than the leaves. Leaves long-petiolate, thickly coriaceous,

Helicophyllum—*continued.*

hastate or sagittate, or the young ones hastate and the older ones pedatisect with segments confluent at base; lateral segments often spirally twisted. *H. Alberti*, an Arum-like plant, is hardy if given a sunny border and a well-drained, sandy loam. It may be propagated from seeds, or by means of the small tuber offsets.

H. Alberti (Albert Regel's). *fl.* very fetid; spadix 5in. long, slender, the appendix bluish-black, ragged at tip; spathe 7in. long, the tube pale green, the lamina dark maroon-purple within, pale green outside, very thick, acuminate. May. *l.* 4in. long, hastate, acuminate, undulated, with two lateral, horn-like, horizontal, basal lobes, and between them two linear, erect ones; petioles stout, 4in. long. Bokhara, 1884. (B. M. 6969.)

HELIGMA. A synonym of **Parsonsia** (which *see*).

HELIOCARPUS. Sun Fruit. This genus is closely allied to *Triumfetta*. Flowers small, disposed in terminal panicles. Leaves three-lobed, serrated.

HELIOPHILA. Cape Stock. To the species described on p. 130, Vol. II., the following should be added:

H. araboides (Arabis-like). A synonym of *H. pilosa incisa.*

H. scandens (climbing). *fl.* white, sometimes tinted rose, large, racemose. *l.* lanceolate. Stems slender, twining. Natal, 1887. An interesting plant. (B. M. 7663.)

HELIOPSIS. To the species described on p. 130, Vol. II., the following should be added:

H. canescens (hoary). A synonym of *H. scabra.*

H. lævis superba (superb). A very showy form, with deep yellow flowers, having an orange disk.

H. Pitcheriana (Pitcher's). A variety of *H. scabra.*

H. scabra (rough). This is now regarded as a good species. *fl.-heads*, rays oblong, nearly or quite 1in. in length. August. *l.* varying from broadly ovate and sub-cordate to ovate-lanceolate, the upper ones occasionally entire. *h.* 2ft. to 4ft. Otherwise as *H. lævis.* North America, 1824. SYN. *H. canescens* (B. R. 592). There is an excellent dwarf form of this, known as Tom Thumb.

H. s. Pitcheriana (Pitcher's). A form with rich orange flower-heads. 1897.

HELIOTROPISM. Having the power of movement under the influence of light.

HELIOTROPIUM. Including *Piptoclaina* and *Tiaridium.* To the species and varieties described on p. 131, Vol. II., the following should be added:

H. incanum (hoary). *fl.* in dichotomously corymbose spikes; corolla white, twice as long as the calyx, rather hispid outside; peduncles hairy. June. *l.* thick, ovate, acute, crenulated, wrinkled above and lined with retrograde asperities, softer and hoary beneath. Stem shrubby. *h.* 2ft. to 3ft. Peru. Greenhouse.

H. i. glabrum (smooth). *fl.* purple. *l.* rough, broadly elliptic, destitute of hairs. 1884. (G. C. n. s., xxii., p. 809, f. 140.)

Varieties. Considerable variation in colour is now shown in these sweet-scented flowers. To the varieties already named the following may be added:

CHARMEUR, very dark; GROSSMANIA, deep violet; LADY MOLESWORTH, light mauve; L'ALBATROSS has a large white eye, edged violet; LA RENOMMÉE, lilac, tinted with rose-violet; LE CID, white, tinted with lilac; MADAME BRUANT, light mauve, white centre; MADAME COMTE, light blue; PRESIDENT GARFIELD, bright mauve-purple; PRIAPO, bright blue, with white eye; ROI DES NOIRS, maroon-purple, white eye, distinct; THE QUEEN, whitish.

HELIPTERUM. **Acroclinium** and **Astelma** (which *see*) are now included hereunder, the specific names remaining unchanged.

H. fasciculatum (fascicled). A form of *Helichrysum sesamoides.*

H. humile (dwarf). A synonym of *Helichrysum* (*Aphelexis*) *humile.*

H. maculatum (spotted). A garden name for *H. Manglesii.*

H. Manglesii flore-pleno (double-flowered). *fl.* deep rosy-pink, double. 1889. This is a great improvement on the type. There is also a double white-flowered form, *alba.*

H. sesamoides (Sesamum-like). A synonym of *Helichrysum sesamoides.*

HELLEBORUS. In this genus it is the Christmas Rose section rather than the Lenten Rose one which is popular. The latter, however, is quite distinct from the former, and should always be represented, the flowers being produced at the time suggested by the popular name. Some beautiful varieties of Lenten Roses have been produced by the florist from *H. orientalis* and *H. viridis.* These require to be planted in shade and in a good rich loam, and to be disturbed as little as possible. During dry summer weather the plants should either be mulched or well watered; and occasional soakings of weak liquid manure are beneficial. When dividing up Lenten Roses this should be done as soon after flowering as possible, April being a good month for the work.

Helleborus—*continued.*

Hellebores suffer badly in some seasons from a destructive fungus, *Phoma effusa.* This is noteworthy from the fact that it lives first as a saprophyte on humus in the soil, and afterwards becomes parasitic. The infested portions should be removed as soon as noticed, and burned, before they can ripen the spores which are scattered in every direction by different agencies. Beyond this little can be done the season the disease is noted. Next season, however, as soon as the leaves appear, they should be sprayed with a solution of potassium sulphide, repeating it after ten days or so.

To the species and varieties described on pp. 132-3, Vol. II., the following should be added:

H. altifolius (tall-leaved). A variety of *H. niger.*

H. angustifolius (narrow-leaved). A synonym of *H. niger minor.*

H. atrorubens is a variety of *H. odorus.*

H. Bocconi (Boccon's). A synonym of *H. viridis.*

H. caucasicus. Other varieties are *guttatus* (striped) and *pallidus* (pale). (R. G., t. 400.)

H. c. nigricans (blackish). This variety differs from the type in having large, bluish-black flowers. 1896.

H. colchicus coccineus (scarlet). *fl.* maroon-crimson. 1890. A fine form.

H. c. venosus (veined). An excellent form, having deep rose-purple, elegantly-veined flowers.

H. hyemalis (winter). A synonym of *Eranthis hyemalis.*

H. olympicus. Of this well-known kind several very desirable varieties are in commerce: *major*, pure white; *roseus*, soft pink; and *superbus*, white, large.

Varieties. Of the Lenten Rose section the following varieties of *H. orientalis* are all worth cultivating:

AFGHAN PRINCE, deep purple; APOTHEKA BOGREN, purple, elegantly spotted; BISMARCK, vinous purple; CHANCELLOR, clear rose, fine flowers; COMMERZIENRATH BENARY, white, with crimson spots, imbricated; DR. HOGG, deep rose; IRENE, soft pink; LASANDRA, rosy-purple, veined and spotted; MRS. LAMBERT, blush white, spotted crimson; PSYCHE, soft pink, blotched crimson; SYLVIA, rose; W. E. GLADSTONE, soft rose, with pink shadings.

Of *H. viridis* varieties there is not such an attractive colour range, nor is the foliage permanent. Nevertheless Columbine, *dumetorum*, Ellen Terry, and *erubescens*, together with the type, should, if possible, have a place in the border, as they are distinct. For naturalising, however, they are still better adapted, the shade of the woodland suiting them to a nicety.

HELLENIA (of Retz). A synonym of **Costus** (which *see*).

HELLENIA (of Willdenow). Included under **Alpinia** (which *see*).

HELMINTHOSTACHYS. Indian Flowering Fern. *H. zeylanica* is a species somewhat difficult of cultivation, requiring stove temperature all the year round and a constantly moist place. The best compost consists of two parts rich loam, one part leaf-mould, and one part sand. Propagation is very slow, as it very seldom forms double crowns, and young plants have never, it is believed, been raised from its spores, which are disposed in small, crested clusters, forming a long, loose spike of peculiar shape. Being deciduous, care must be taken that, during the resting season, its roots and rhizome, both of which are of a succulent nature, do not become dry, in which case it would seriously suffer and possibly die outright. *H. zeylanica* is of little value as a pot plant, but highly interesting when grown in a warm Fernery in a moist situation, where it does not get disturbed during the resting season.

HELONIAS. According to the "Index Kewensis," four species, natives of North America and Tropical Africa, are referred to this genus, which is closely allied to *Tofieldia*. Several plants formerly included hereunder are now referred to **Chamælirium, Melanthium, Stenanthium, Veratrum, Xerophyllum,** and **Zygadenus.**

HELONIOPSIS (from *Helonias*, and *opsis*, resemblance; alluding to the affinity of the genera). SYN. *Sugerokia*. ORD. *Liliaceæ*. A small genus (four species) of greenhouse or hardy perennials, natives of Japan and Formosa. Flowers solitary or few at the tip of the scape, rather large, slightly nodding; perianth segments distinct or scarcely connate at base, oblong or narrow, sub-equal, spreading; stamens six; scape erect, simple. Leaves radical, petiolate, oblong or lanceolate, scarious-sheathed at base. Rhizome short, horizontal. *H. japonica*, the only species in cultivation, thrives in any fairly good garden soil, and may be increased by divisions in autumn.

H. japonica (Japanese). *fl.*, perianth rose-coloured, five to six lines long, the segments free, narrow; stamens very shortly exserted; pedicels usually longer than the flowers; raceme short, two- to ten-flowered. April. *l.* oblanceolate, at the flowering period 3in. to 4in. long and 1in. broad, brownish towards the tips. Japan, 1881. Wrongly called *H. umbellata* in G. C. ser. iii., vol. i., p. 711. (B. M. 6986.)

HELOSPORA. A synonym of **Timonius** (which *see*).

HELWINGIA. *H. ruscifiora* is the correct name of *H. ruscifolia*.

HELYGIA. A synonym of **Parsonsia** (which *see*).

HEMEROBIUS. *See* **Lacewing Flies.**

FIG. 442.—FLOWER OF HEMEROCALLIS AURANTIACA MAJOR.

HEMEROCALLIS. This genus embraces five species, natives of Central Europe and temperate Asia, Japan especially.

These very accommodating plants should be freely used in the mixed borders and in the shrubbery. The flowers are very useful for cutting if picked in the bud state, those of *H. flava* and *H. Thunbergii* being especially so. In moist or in dry soils the plants seem to do equally well, providing they are not often disturbed. They may be planted in either autumn or spring, at which time, too, they should be divided for purposes of increase.

To those described on p. 134, Vol. II., the following should be added:

H. aurantiaca (orange-coloured). *fl.* six to eight in a corymb; perianth bright orange-yellow, the segments above 3in. long, crisped; main peduncles about 1in. long. July. *l.* six to eight to a stem, ensiform, 5ft. long, 1in. broad, acutely keeled. Stem 3ft. long. Habitat uncertain, but probably Japan or Eastern Siberia, 1890.

H. a. major (larger). *fl.* bright orange, firm; perianth tube ¾in. long, the limb 4in. long. *l.* 1in. to 1½in. broad, firm, strongly ribbed. Japan, 1895. (G. C. 1895, xviii., pp. 62, 71, f. 14; Gn. 1895, xlviii., p. 400, t. 1041.) See Fig. 442.

H. citrina (Citron-yellow). *fl.* Lemon-yellow. China, 1897. This species differs from *H. minor* in having much larger flowers and leaves twice as broad; and from *H. Dumortierii* in the flowers being twice the size, with a longer tube and scape, and in the leaves being thrice as long.

H. flavo-Middendorfii (hybrid). *fl.* Citron-yellow, the outer perianth segments brick-red on the exterior. A garden hybrid between the species indicated in the name. 1897. (R. H. 1897, p. 247.)

H. fulva angustifolia (narrow-leaved). *fl.* orange-yellow, the slender tubular portion of the perianth half as long as the segments. Japan, 1885. SYN. *H. f. longituba* (R. G. 1187).

H. f. maculata (spotted). *fl.* having a deltoid, reddish-purple blotch on the inside of the perianth. North-Western China, 1897.

H. Thunbergii (Thunberg's). *fl.* rich clear yellow, very sweet-scented. July. *h.* 1½ft. Japan.

HEMICARPURUS. A synonym of **Pinellia** (which *see*).

HEMIGENIA (from *hemi*, half, and *genea*, to beget; in reference to the absence of the two upper stamens). Including *Atelandra*. ORD. *Labiatæ*. A genus embracing about twenty-two species of greenhouse shrubs or undershrubs, all Australian, closely allied to *Hemiandra*. Two of them have been introduced, but they are probably no longer grown.

HEMIGRAPHIS (from *hemigraphos*, half-written; in allusion to the shape of the corolla). ORD. *Acanthaceæ*. A genus embracing about a score species of stove or greenhouse, annual or perennial herbs, inhabiting the East Indies, the Malayan Archipelago, China, and Japan. Flowers rather small, solitary or rarely twin, spicate; calyx deeply five-cleft or five-parted, the segments often more or less connate below the middle; corolla tube slender, shortly enlarged above, the limb of five rounded, spreading lobes; stamens four, didynamous, included; bracts often imbricated; bracteoles minute or wanting. Leaves opposite, entire or toothed. For culture of the species described below, *see* the allied genus **Ruellia.**

H. colorata (coloured). *fl.* white; corolla narrow, six to seven lines long; spikes terminal, tetragonal, pedunculate. *l.* cordate-ovate, crenate, bullate, 2¾in. long, 1¾in. broad, tinted silvery-grey on the upper surface, purple beneath; petioles 1¼in. long. Stem creeping, and, as well as the petioles, loosely hairy. India, 1885. Stove perennial.

H. latebrosa (secret). The correct name of the plant described on p. 333, Vol. III., as *Ruellia latebrosa*.

HEMIMERIS. One or two species formerly included hereunder are now referred to **Alonsoa.**

HEMIONITIS. Ivy-leaved Fern. Although some eight or nine species of *Hemionitis* are known and described, only three or four of them are usually grown; these are easily-grown plants of dwarf habit. When grown in pots, all these singular Ferns require is a mixture of two parts of fibrous, soft peat, and one part of sand, or where the peat obtainable is of a somewhat close nature, the mixture is benefited by the addition of one part of chopped sphagnum. It is essential, on account of the few roots which they produce, that these plants should be kept in pots of comparatively small dimensions, and that the drainage should be perfect. All are liable to the depredations of Aphides, which are easily destroyed by slight fumigations; occasionally, also, Thrips may make their appearance on the foliage, in which case the most efficacious treatment consists in a dip in a slight solution of lemon oil. *H. cordata* (Fig. 443) is one of the most distinct species.

Propagation is readily effected by spores, which germinate freely, and also by means of the young plants that most kinds produce at the base and at the notches of the segments of the fronds, which, for that purpose, should be firmly laid on the surface of the soil recommended above.

Hemionitis—*continued.*

FIG. 443. HEMIONITIS CORDATA.

HEMIORCHIS (from *hemi*, half, and *Orchis*; the plant much resembles an Orchid). ORD. *Scitamineæ*. A monotypic genus. The species is a quick-growing,

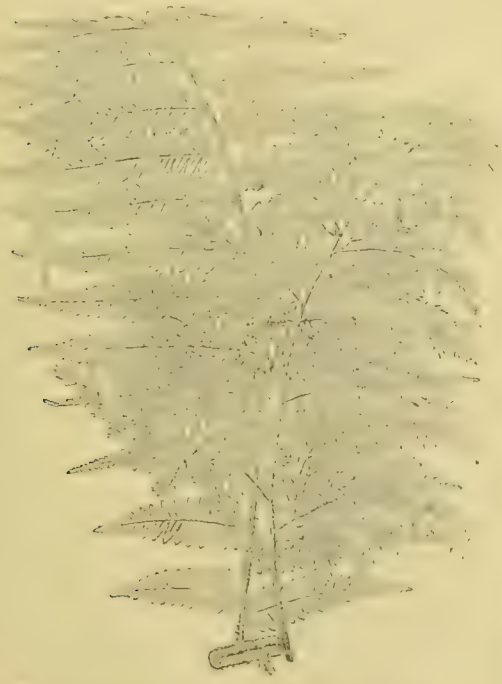

FIG. 444. PINNA OF FROND AND FILAMENTOUS GROWTH AT BASE OF RACHIS OF FROND OF HEMITELIA CAPENSIS.

Hemiorchis—*continued.*

stove, herbaceous plant, native of the Eastern Himalayas and Birma, allied to *Globba*. For culture, *see* **Alpinia.**

H. burmanica (Birma). *fl.* ¾in. across, produced before the leaves; calyx reddish-brown, with ovate segments; lateral staminodia yellowish-white, about as long as the corolla segments; lip yellowish-white, spotted with reddish-brown, orbicular; spike short, dense; peduncle hidden by the bract-leaves. *l.* three to six, produced on a short special stem, oblong, acute, very pale beneath. Rootstock white, tuberous. (B. M. 7120.)

HEMIPILIA (from *hemi*, half, and *pilion*, a cap; alluding to the covering of the pollen mass). ORD. *Orchideæ*. A small genus (three species) of stove Orchids, with the habit of *Habenaria rotundifolia*, natives of the East Indies. Flowers few in a raceme; sepals nearly equal in length, the dorsal one concave, the lateral ones spreading, oblique; petals smaller, undivided; lip continuous with the column, spreading, rather broad, the base produced in a spur; column very short. Stems having one leaf at the base. For culture, *see* **Pogonia.**

H. amethystina (amethystine). *fl.* white and purple, Ophrys-like, ½in. in diameter, numerous; scape erect, 8in. long. *l.* solitary, ovate, cordate, 4in. long, yellowish-green, marbled with brown. Tuber small, fleshy. Birma, 1897. (B. M. 7521.)

H. calophylla (beautiful-leaved).* *fl.*, sepals white and green, rarely purple; petals similar, but much smaller; lip dark vinous-purple, ¼in. broad; raceme six- to eight-flowered; scape 5in. to 7in. high, green, spotted reddish-brown. July. *l.* 2in. to 3in. long, 1¼in. to 1½in. broad, sessile on the tuber, the acute base sunk in the ground, dark green, mottled brown. Moulmein, 1886. (B. M. 6920.)

HEMIPTERA. *See* **Insects.**

HEMISACRIS. A synonym of **Schismus** (which *see*).

HEMISANDRA. A synonym of **Aphelandra** (which *see*).

HEMITELIA. With very few exceptions, Hemitelias require stove temperature, which no doubt accounts for their not being more generally cultivated. Most of them are strong growers, the trunks in many cases attaining 15ft. or more in height; they therefore require large structures to enable them to perfectly develop their broad, shining fronds, which have an imposing appearance in a fernery planted in company with other kinds having more delicate or finely-divided foliage. The beauty of the under-surface of the fronds is greatly enhanced by the position of the sori, which usually form an almost uninterrupted line round the leaflets.

Hemitelias are not by any means difficult to grow if potted or planted in a mixture consisting of about equal parts peat, loam, and sand. During the growing season they require not only a good deal of heat, but also a large amount of moisture at the roots and along their trunks, most of which are of a drier and more woody nature than those of other Tree-Ferns.

Propagation is almost invariably from spores, which germinate freely, though the plants may also be increased by means of lateral offsets, which are occasionally produced along the trunks of certain species. Two of the most popular kinds are *H. capensis* (Fig. 444) and *H. Smithii* (Fig. 445).

To the species described on pp. 135-6, Vol. II., the following should be added:

H. Brunoniana (Brown's). *fronds*, rachis of pinnæ often free from prickles; rachis of pinnules beneath more or less crisped-pubescent; veinlets two-branched, very rarely three-branched. *sori*, involucre membranous, reduced before the capsules are ripe to a hemispheric cup or sub-patelliform scale. *h.* 10ft. to 40ft. India.

H. guianensis (Guiana). A synonym of *H. multiflora*.

H. Lindeni (Linden's). *fronds* pinnate; pinnæ shortly stalked, thin, 6in. to 12in. long, 1in. to 1¼in. broad, acute, the margins cleft into regular, short lobes having their apex directed upwards. *sori* disposed in two or three irregular lines or series on the margins of the pinnæ. Caracas, 1894.

H. multiflora Paradæ. *fronds* larger than in the type, glabrous, bipinnate; rachis wingless, marked with white lenticels. *sori* marginal, copious. Colombia, 1877. Habit more robust. (I. H. 1877, t. 280, under name of *I. guianensis Paradæ*.)

Hemitelia—*continued.*

FIG. 445. PORTION OF FROND OF HEMITELIA SMITHII.

H. Walkeræ (Mrs. Walker's).* *fronds* ample, bi- or tripinnate; pinnæ 1½ft. long; pinnules 3in. to 4in. long, cleft nearly or quite to the midrib; lobes oblong, very blunt, entire or slightly notched. *sori* occupying the lowest forking of the veins close to the midrib; involucre large, roundish. Ceylon (at 6000ft. elevation).

HEMIZONIA (from *hemi*, half, and *zone*, a girdle; in allusion to the half-enclosed ray-achenes). ORD. *Compositæ*. A genus embracing about twenty-five species of Californian herbs, nearly all annuals or biennials, usually glandular, viscid, and strongly scented, allied to *Layia*. Flower-heads yellow or white, usually small or mediocre. Leaves alternate or sometimes opposite. Only one species, *H. pungens*, has been introduced. It is described (G. C. 1898, xxiv., p. 298) as a "quick-growing shrub, with straggling white branches, bright green, spinous leaves, and yellow flowers," but according to the "Synoptical Flora of North America," it is only an annual or a biennial.

HEN-AND-CHICKENS HOUSELEEK. *See* **Sempervivum soboliferum.**

HENCKELIA. Included under **Didymocarpus** (which *see*).

HENDERSONIA. *See* **Sphæropsideæ.**

HENFREYA. A synonym of **Asystasia** (which *see*).

HENICOSTEMMA. A synonym of **Enicostema** (which *see*).

HENNINGIA. A synonym of **Eremurus** (which *see*).

HENRICEA. A synonym of **Swertia** (which *see*).

HEPATICA. Included under **Anemone** (which *see*), the correct name of *H. triloba* being *A. Hepatica*.

HEPETIS. A synonym of **Pitcairnia** (which *see*).

HEPIALIDÆ. *See* **Moths.**

HEPIALUS HUMULI. *See* **Ghost Moth,** in present volume, and **Otter Moth** in Vol. II.

HEPIALUS LUPULINUS. *See* **Common Swift Moth.**

HEPTA. In Greek compound words this signifies seven; *e.g.*, Heptamerous (having seven parts), Heptandrous (having seven stamens).

HEPTAPLEURUM. SYN. *Sciadophyllum* (of Blume). To the species described on p. 136, Vol. II., the following should be added:

H. venulosum erythrostachys (red-spiked).* *fl.* deep red, very tiny, in a branched, terminal panicle. *l.* very large, long-stalked; leaflets broad. Branches strong, spreading. Tropical Asia, 1895. A small, pretty tree. (B. M. 7402.)

H. vitiense (Fiji). *fl.* three to seven in an umbel. *l.* digitate; leaflets obovate-oblong, obtuse, narrowed to the petiole, entire, with horizontally spreading veins. Fiji, 1887. SYN. *Agalma vitiensis*.

HERACLEUM. To the species described on p. 137, Vol. II., the following should be added:

H. eminens (conspicuous). A synonym of *H. platytænium*.

H. flavescens (yellowish).* *fl.* yellowish, not radiating. A less vigorous species than either *H. pubescens* or *H. persicum*, but more ornamental on account of its more abundant and more divided foliage. Austria, 1889. Perennial.

H. lanatum (woolly). *fl.* white; umbels widely spreading, 6in. to 10in. in diameter. *fr.* nearly ¼in. long. *l.* ternately divided, very large, glabrous above, tomentose-pubescent beneath; principal divisions 4in. to 10in. in diameter, unequally lobed, the lobes acuminate. Stem sulcate, pubescent, 4ft. to 8ft. high. North America, &c. Perennial. In the form *vestitum* the upper part of the stem and the petioles are densely woolly.

H. Mantegazzianum (Mantegazzi's).* *fl.* disposed in an immense umbel, attaining 4½ft. in diameter, and containing as many as 10,000 flowers; stem strong, erect, coppery-red. *l.* 3ft. long, forming a tuft about 12ft. in diameter. Orient, 1897. A gigantic species.

H. persicum (Persian). *fl.* white, in large umbels; inflorescence shortly papillose-pubescent. *fr.* ¼in. long. *l.* large, highly glabrous above, shortly pubescent beneath, pinnate or bipinnate; segments three or four pairs, the lower ones petiolulate, all cut into lanceolate, acuminate segments. *h.* 12ft. Persia, &c., 1888. Biennial. Allied to *H. pubescens*.

H. platytænium (broad-ribboned). *fl.* white; umbels sometimes 1ft. in diameter, many-flowered, softly hairy. June. *fr.* large, papillose-hairy. *l.* very large (often 2ft. long), glabrescent above, cobwebby beneath; lower ones trisected; segments petiolate, cordate, broadly and very obtusely palmate-lobed; upper ones tripartite. *h.* 4ft. to 5ft. Western Asia, 1871. Biennial. SYN. *H. eminens* (G. C. 1871, p. 875).

H. pubescens (downy). *fl.* white, in many-rayed umbels; inflorescence scabrid-setulose. Summer. *l.* glabrous above, pubescent beneath, pinnatisect; segments two or three pairs, cleft into elliptic, shortly acuminate lobes, the lower ones shortly pedicellate. Taurian Mountains, &c. Biennial. The form *Wilhelmsii* only differs in the fruit.

H. Wilhelmsii (Wilhelms'). A form of *H. pubescens*.

HERB. Specifically, a plant of which the stem dies to the ground at the end of the season. Herbs are annual, biennial, or perennial in duration.

HERBAL. A title given by old writers to books on plants, *e.g.*, Parkinson's and Gerarde's "Herbals."

HERBARY. An old name for that part of the garden devoted to the culture of **Herbs** (which *see*).

HERB CHRISTOPHER. *See* **Actæa spicata.**

HERBERTIA. SYNS. *Alofia*, *Trifurcia*. *H. cærulea* is regarded by J. G. Baker as identical with *H. Drummondiana*.

HERITERIA (of Schrank). A synonym of **Tofieldia** (which *see*).

HERITIERA (of Gmelin). A synonym of **Lachnanthes** (which *see*).

HERITIERA (of Retzius). This is now considered to be synonymous with **Alpinia** (which *see*).

HERMANNIA. To the species described on p. 137, Vol. II., the following should be added:

H. argentea (silvery). *fl.* orange and yellow; calyx shortly campanulate; peduncles racemose, one-flowered. May. *l.* bipinnatifid, covered with stellate scales; lobes decurrent. *h.* 2ft. South Africa, 1820.

H. aurea (golden). A synonym of *H. althæifolia.*

H. conglomerata (conglomerate). *fl.* yellow, small, subcapitate, crowded at the ends of the branches. *l.* ¼in. to ⅜in. long, petiolate, cuneate-ovate or nearly round, very obtuse, crenate or incised, plaited and undulated, hairy beneath. *h.* 1ft. to 2ft. South Africa, 1872. A spreading, hispid shrub. (Ref. B. 217.)

H. cristata (crested).* *fl.* of a bright brick-red, solitary in the axils of the upper leaves; calyx ¼in. long; petals 1in. long, with an incurved claw and an orbicular, recurved limb. Autumn. *l.* 1in. to 1½in. long, sessile or shortly petiolate, linear-oblong, acute, crenate-serrate or toothed. Stems ascending, 1ft. to 1½ft. high. Transvaal, 1890. (B. M. 7173.)

H. denudata (naked). *fl.* yellow, small; peduncles racemose-paniculate, one- to three-flowered. *l.* shortly petiolate or subsessile, lanceolate, acute, 1in. to 2in. long, coarsely toothed above the middle. *h.* 2ft. to 3ft. South Africa. A glabrous, straggling shrub.

H. fasciculata (fascicled). A synonym of *H. linearifolia.*

H. linearifolia (linear-leaved). *fl.* purplish; peduncles racemose, drooping, one-flowered, shorter than the leaves. *l.* 1in. long, one line broad, obtuse, glabrous and slightly viscid. Branches glabrous, divaricate. South Africa, 1869. A stout, scrubby bush. SYN. *H. fasciculata* (Ref. B. 289).

H. scoparia (Broom-like). *fl.* bright yellow, pendulous, in secund racemes. *l.* mostly linear, 1in. long, sub-sessile, scattered; lower ones linear-cuneate, often three-toothed at apex. Branches erect. Stems several from the same crown, trailing, 1ft. to 1½ft. long, shrubby at base. South Africa, 1870. (Ref. B. 195.)

HERMINIUM. Including *Chamorchis. Aopla* (referred to this genus by Bentham and Hooker) is now included under **Habenaria** (which *see*). To the species described on p. 138, Vol. II., the following should be added:

H. alpinum (alpine). *fl.* white; lip ovate, repand, twice as large as the acute petals; spike few-flowered, shorter than the leaves. May. *l.* linear, Grass-like. Mountains of Europe, 1824. (B. R. 1499.)

H. reniforme (kidney-shaped). A synonym of *Habenaria reniformis.*

HERMIONE. Included under **Narcissus** (which *see*).

HERMODACTYLUS TUBEROSUS. According to J. G. Baker, this is the correct name of the plant described on p. 198, Vol. II., as *Iris tuberosa.*

HERNANDIA. *Hertelia* is synonymous with this genus.

HERNANDIEÆ. A tribe of **Laurineæ** (which *see*).

HERPESTIS. SYNS. *Anisocalyx, Bramia, Caconapea, Calytriplex, Cardiolophus, Heptas, Mecardonia, Mella, Monniera* (of P. Brown), *Ranaria, Septas* (of Loureiro). Calyx five-parted; corolla with a cylindrical tube and spreading lobes; stamens four, included.

H. cuneifolia (cuneate-leaved). A synonym of *H. Monniera.*

HERPOTRICHA NIGRA. *See* under **Juniperus—Diseases.**

HERRERA. A synonym of **Erithalis** (which *see*).

HERRERIA. According to the "Index Kewensis," *H. Salsaparilha* is the correct spelling of the name of the species described on p. 138, Vol. II.

HERTELIA. A synonym of **Hernandia** (which *see*).

HESIODIA. A synonym of **Sideritis** (which *see*).

HESPERALOE (from *hesperos*, Western, and *Aloe*; alluding to the aspect of the plant and its native habitat). ORD. *Liliaceæ.* A genus embracing only a couple of species of very striking and interesting, greenhouse plants, having a leafy stem or a very short caudex, natives of North America, and closely allied to *Yucca.* Perianth straight, cylindrical; segments narrow, nearly equal. Leaves clustered, linear, channelled, rigid, filamentose on the margins. For culture, *see* **Yucca.**

Hesperaloe—*continued.*

H. Davyi (Davy's). *fl.* green and white, 1in. long; panicle 12ft. high, copiously branched, the branches 1ft. to 2ft. long. *l.* 4ft. long, broader than in *H. yuccæfolia*, with brown marginal fibres. California (?), 1898.

H. Engelmanni (Engelmann's). A synonym of *H. yuccæfolia.*

H. yuccæfolia (Yucca-leaved). *fl.* pale rose-coloured, fascicled at the sides of the rachis or branches of the loose racemes; perianth cylindrical, straight, the segments narrow, sub-equal; stamens six; peduncle or scape leafless, 3ft. to 4ft. high, simple or with a few straight branches. *l.* clustered, linear, channelled, rigid, the margins white-filamentose. Texas, 1882. (G. C. 1882, xviii., p. 199, f. 34.) SYN. *H. Engelmanni.*

HESPERANTHA. To the species described on p. 138, Vol. II., the following should be added:

H. longituba (long-tubed). *fl.* three to eight; inner segments white, outer ones tinged with reddish-brown, ½in. to ⅝in. long; spathe valves tinged with red; scape 1ft. high. *l.* two or three, distichous, glabrous, grass-like, 6in. to 9in. long, with a reduced one clasping the scape below the middle. 1877.

HESPERIS. Siliquas elongated, nearly terete or tetragonal. To the species described on p. 139, Vol. II., the following should be added. A few species formerly included hereunder are now referred to **Malcolmia.**

H. arabidiflora (Arabis-flowered). A synonym of *Parrya Linnæana.*

H. violacea (violet).* *fl.* violet; claw of the petals included, the lamina obovate; pedicels about equalling the calyx; raceme almost paniculate. *fr.*, siliquas 2½in. to 3in. long. June. *l.*, radical ones oblong, entire or repand, rarely almost runcinate; cauline ones lanceolate, acute, almost entire. *h.* 6in. to 12in. Asia Minor. A pretty annual or biennial.

HESPEROCALLIS (from *hesperos*, Western, and *kallos*, beauty; in allusion to the habitat of the plant, *Hemerocallis*, to which the present genus bears some resemblance, being an Eastern one). ORD. *Liliaceæ.* A monotypic genus. The species is a greenhouse or half-hardy plant, with a short, woody caudex, allied to *Hemerocallis.* For culture, *see* **Yucca.**

H. undulata (waved). *fl.* whitish, sweet-scented, large, shortly pedicellate, in a simple raceme; perianth funnel-shaped, the tube cylindrical, the lobes oblong-spathulate, longer than the tube, erecto-patent; stamens six; bracts under the pedicels scariose, sometimes a few leafy ones below the inflorescence; scape erect, simple. February and March. *l.* radical, linear, elongated, undulated, rather thick, broadly edged with white. California, 1882.

HESPEROCHIRON (from *hesperus*, evening, used for Western, and Chiron, a Centaur distinguished for his knowledge of plants, *i.e.*, Western Centaury; the plants were formerly supposed to belong to the Gentian Family). ORD. *Hydrophyllaceæ.* A small genus (two or three species) of nearly or quite hardy, perennial rock-plants, natives of North America. Flowers solitary, on axillary peduncles; corolla purplish or nearly white; parts of the flower occasionally in sixes or sevens. Leaves entire, spathulate or oblong, on mostly elongated, margined petioles, crowning the caudex or rootstock. The plants thrive in any ordinary soil. Good drainage must be afforded.

H. californicus (Californian). *fl.* white, with dark stripes; corolla oblong-campanulate, ½in. to ⅝in. long. July. *l.* copious in a radical rosette, 1in. to 2in. long. California, &c., 1823. SYN. *Nicotiana nana* (B. R. 833).

H. pumilus (dwarf). *fl.* white, veined with violet and with a yellow base, nearly rotate; lobes longer than the tube, which is hairy within. *l.* all radical, 2in. to 2½in. long, ½in. to ⅝in. broad, spathulate, hairy beneath. Idaho to Oregon, 1888. Hardy alpine, with tuberous rootstock. SYN. *Villarsia pumila.*

HESPEROCLES. A synonym of **Nothoscordum** (which *see*).

HESPEROSCORDUM. Included under **Brodiæa** (which *see*).

HESSEA. Eight species are referred to this genus by J. G. Baker. Flowers pink, small; perianth cut down nearly or quite to the ovary, the segments spreading; stamens inserted at the base of the segments. To the

Hessea—*continued.*

species described on p. 139, Vol. II., the following should be added:

H. Duparquetiana (Duparquet's). *fl.* about twenty in an umbel; perianth 2in. long, with a short tube; segments white, with a carmine keel, flat, narrow; pedicels 4in. long; peduncle as thick as a finger. *l.* lorate, 1ft. long at the flowering period. Kalahari region, South Africa. SYN. *Imhofia Duparquetiana.*

HESSEA (of Bergius). A synonym of **Carpolyza** (which *see*).

HESSIAN FLY (*Cecidomyia destructor*). Though known in America for upwards of a century and a quarter, and on the Continent of Europe for over half a century, it was not until 1886 that this insect was discovered in England. As its specific name suggests, it is very destructive, the crops laid under contribution being Wheat, Barley, and Rye. As, too, it will also attack several of the grasses found in pastures, it is a very undesirable insect to establish itself. The name Hessian Fly was bestowed upon it as long ago as the War of Independence, at which time it was said to have been introduced by the Hessian troops.

Cereals attacked by the Hessian Fly present a very characteristic appearance, as they bend down as if storm-laid. This is due to the larvæ attacking the stem at points where the leaves encircle it, preferably, it seems, low down. Here it extracts the nutriment to such an extent that the stem is so weak as to be unable to stand up, and the ears of corn, if they are produced, are but miserable specimens. The perfect insects are minute Midges (2mm. to 3mm. in length), and therefore quite inconspicuous. They vary as to colour with the sexes, and also in individuals, but usually they are a velvety-black, with a pink or brownish abdomen, marked into black squares. The insects are on the wing in early summer. In America *Cecidomyia destructor* is double-brooded, but in this country only one brood is usually hatched.

The larva shortly before becoming a pupa has the power of exuding a peculiar substance, from which it evolves a most extraordinary case that may be likened unto Flax seed. In this it sloughs the larval skin, and becomes a pupa. It is frequently stated that the pupa state is assumed in the shrunken skin of the larva, but this is not the case, as the latter may be found distinct from the pupa in the Flax seed-like puparia.

As remedial measures are practically hopeless, the cultivator has to rely upon prevention and Nature. In the latter case he is aided by several destructive parasites of the Hessian Fly, one European species in particular, *Semiotellus nigripes*, being of the greatest benefit, and it has been imported into various parts of America on that account. There are numbers of others. Early sowing of Wheat and Barley is recommended, as it has been found that late-sown cereals are more liable to attack, as in the former case (say in October) the perfect insects are not in evidence. Thick-strawed cereals are also advocated, and those varieties which to a certain extent are insect-resisting. Burning the stubble is by some advocated as a precautionary measure if carried out in a systematic manner, commencing at the edges of field. Others, however, say that, by burning, the useful parasites to which attention has been directed are likewise destroyed. All fields should be kept clear of grass weeds; and, according to Griffiths, land dressed with a manure consisting of nitrate of soda 2cwt. and agricultural salt ½cwt. to the acre, will prove of immense benefit.

HETERANTHERA. SYNS. *Buchosia, Leptanthus.* Of the three species introduced, *H. limosa* is the best known.

HETEROCERA. *See* **Moths.**

HETERODERA RADICICOLA. One of the most destructive species of Eelworms, and responsible for the galls found upon the roots of many vegetables and fruits, but especially upon Tomatoes, Cucumbers, and Vines. *See* **Eelworms.**

HETERODERA SCHACHTII. *See* **Nematoid Worms.**

HETERŒCIOUS. Fungi are said to be heterœcious when they are parasitic upon different plants at different stages—*e.g.*, *Gymnosporangium*, several species of which require two widely distinct plants in order to complete the cycle of life.

HETEROPAPPUS. *H. decipiens* is a form of *H. hispidus.*

HETEROPHLEBIUM. Included under **Pteris** (which *see*).

HETEROSPERMUM (from *heteros*, variable, and *sperma*, seed). ORD. *Compositæ.* A small genus (five species) of small, hardy or half-hardy annuals, mostly natives of the warmer parts of America, allied to **Coreopsis** (which *see* for culture). Flower-heads yellow, small, the three to five rays little exserted. Leaves opposite, pinnately or ternately dissected, or sometimes undivided. *H. Xanti* (SYN. *H. Xanthii*, R. G. 1898, p. 429, f. 79) is described as a dwarf-growing, hardy, Californian annual, much resembling the well-known *Sanvitalia procumbens.*

HETEROSPORIUM ECHINULATUM. *See* **Carnation Fairy Ring Spot.**

HETEROSTALIS. Included under **Typhonium** (which *see*).

HETEROTAXIS. Included under **Maxillaria** (which *see*).

HETEROTHRIX. A synonym of **Echites** (which *see*).

HETEROTOMA. *Myopsis* is synonymous with this genus.

HETEROTRICHUM (from *heteros*, variable, and *thrix, trichos*, hair; in allusion to the variable hairs on the leaves). ORD. *Melastomaceæ.* A genus embracing half-a-dozen species of stove, often hispid-pilose or glandular shrubs, natives of Guiana, Colombia, and the West Indies. Flowers white or pink, small or rather large, in terminal or rarely lateral panicles; petals six to eight; stamens twelve or indefinite. Leaves petiolate, ample, ovate-cordate or oblong, entire or serrulated. *H. macrodon*, the only species calling for mention here, thrives in a compost of sandy loam and peat, and may be increased by cuttings.

H. macrodon (long-toothed). *fl.* in terminal cymes of ten to twelve; petals pure white, red at base, obovate, imbricated; stamens sixteen. Autumn. *l.* opposite but very unequal, cordate-ovate, acuminate, dentate-toothed, seven-nerved, paler beneath. Branches and stalks covered with rufous hairs. *h.* 7ft. to 9ft. Caraccas and Colombia. (B. M. 4421.)

HETEROTRICHUM (of Bieberstein). Included under **Saussurea** (which *see*).

HETEROTROPA. *See* **Asarum.**

HEUCHERA. Those kinds, like *H. hispida*, which are grown for their foliage should have their flowers pinched out. The Heucheras may be effectively employed upon rockeries. They may be divided in either autumn or spring.

To the species described on p. 140, Vol. II., the following should be added:

H. brizoides (Briza-like). A garden hybrid between *Tiarella purpurea* and *Heuchera sanguinea.* 1897.

H. pilosissima (very pilose). *fl.*, petals linear, twice the length of the teeth of the sub-globose calyx. *l.* ovate-cordate, rather obtusely lobed, toothed. California. Plant sub-caulescent, very villous with long, spreading, glandular hairs.

H. rosea (rosy). A garden hybrid between *H. pilosissima* and *H. sanguinea.* 1893.

H. sanguinea alba (white).* This form differs from the type in having pure white flowers. 1896. (I. H. 1896, p. 334, f. 32.)

H. s. grandiflora (large-flowered). This has flowers of a larger size and more brilliant colour than the type.

H. s. splendens (splendid). Another improvement upon the type as regards colour.

HEUDELOTIA. A synonym of **Balsamodendron** (which *see*).

HEVEA. *H. guianensis* (SYNS. *Siphonia Cahuchu* and *C. elastica*) furnishes the Brazilian or Bottle Rubber of commerce.

HEWARDIA. Included under **Adiantum** (which *see*), the correct name of *H. adiantoides* being *A. Hewardia.*

HEWITTIA BICOLOR. The correct name of **Palmia bicolor** (which *see*).

HEX. In Greek compound words this signifies six; *e.g.*, Hexandrous (having six stamens), Hexagynous (having six styles).

HEXADESMIA (from *hex*, six, *a*, without, and *desmos*, a bond or thong; in allusion to the six separated pollen masses). ORD. *Orchideæ*. A small genus (four or five species) of stove, epiphytal, branched Orchids, natives of Mexico, Central America, the West Indies, and Brazil, allied to *Scaphyglottis*. Flowers small, fascicled or racemose. Leaves fleshy. Three of the species have been introduced, but they are seldom seen outside botanical collections.

HEXAGLOTTIS. Including *Plantia*. Flowers yellow, three or four in a cluster; perianth cut down to the ovary into six sub-equal, spreading segments, twisting spirally as it fades; filaments very short, flattened, connivent; panicle having few spicate branches. Leaves one or two, linear or nearly terete. Rootstock a tunicated corm.

HEXAMERIA. A synonym of **Podochilus** (which *see*).

HEXISIA (from *exisoein*, to be equal or like; in reference to the conformity of the lip with the sepals). SYN. *Euothonæa*. ORD. *Orchideæ*. A small genus (three or four species) of epiphytal Orchids, inhabiting tropical America from Brazil to Mexico. Flowers mediocre; sepals nearly equal, narrow, the dorsal one free, the lateral ones produced in a very short chin; petals resembling the dorsal sepal; lip erect, connate with the column at base, the lateral lobes obscure, the middle one lanceolate, spreading, equalling the sepals; column short; pollen masses four; racemes terminal, few-flowered; peduncles short. Leaves narrow, rather rigid. Only one species is known in gardens. For culture, *see* **Ornithidium.**

H. bidentata (two-toothed).* *fl.* bright scarlet, about ½in. in diameter; sepals and petals linear, acute; lip narrow obovate-oblong; racemes short, arising from the nodes. *l.* linear-oblong, not longer than the joints. Stems constricted at the nodes, the joints 1in. to 1½in. long. Panama, Colombia, 1887. A pretty little Orchid. (B. M. 7051.)

HEXORIMA. A synonym of **Streptopus** (which *see*).

HEYMASSOLI. A synonym of **Ximenia** (which *see*).

HEYNEA (commemorative of Dr. Heyne, a German botanist). ORD. *Meliaceæ*. A small genus (two or three species) of stove trees or shrubs, restricted to India and the Indian Archipelago. Flowers rather small, in terminal and axillary, corymbose panicles. Leaflets five to eleven, opposite, entire. *H. trijuga* (B. M. 1738) and *H. quinquejuga* have been introduced, but are probably lost to cultivation.

HIBISCUS. Including *Abelmoschus* and *Triguera*. Calyx five-cleft or five-toothed; staminal column truncate or five-toothed; ovary five-celled.

The varieties of hardy Hibiscuses grow well in ordinary garden soil, but prefer one that is sandy, deep, and rich. A sunny position is advisable, although not absolutely essential to ripen the wood sufficiently to enable them to carry a good display of blossom each autumn. Propagation may be carried on by means of seeds, and if sown in March in light soil and placed in gentle heat, they vegetate freely. Cuttings of the current season's matured wood taken in early autumn and dibbled in sandy soil, and the pots plunged in warm bottom-heat and kept close, emit roots in about a fortnight. They must be shaded from the sun on bright days. Layering about midsummer and in early autumn is sometimes practised; and grafting on stocks of the type in spring in heat, and treated as recommended for the Hamamelis, is also successful.

To the species and varieties described on pp. 142-3, Vol. II., the following should be added. A few species formerly included here are now classed under **Fugosia.**

H. Archeri (Archer's). A garden hybrid between *H. Rosa-sinensis* and *H. schizopetalus*.

H. californicus (Californian). *fl.* white, with a purple centre, 2in. to 3in. long, 5in. to 5½in. across. Late summer or autumn. *l.* cordate, acuminate, rarely somewhat three-lobed, crenate or acutely toothed, 3in. to 5in. long, exceeding the petioles, velvety-pubescent when young. *h.* 5ft. to 7ft. Island in San Joaquin River, California. Perennial.

H. calycinus (prominent-calyxed). *fl.* large, campanulate; petals yellow, with a purple spot at base, broad-obovate. *l.* pale green, roundish, sub-trilobate, serrated. Stems hairy. Natal. Greenhouse shrub. SYN. *H. chrysanthus*.

Hibiscus—*continued.*

H. chrysanthus (golden-flowered). A synonym of *H. calycinus*.

H. cisplatinus (Plane-like). *fl.* pale rose, 2½in. in diameter; calyx campanulate, surrounded by numerous linear bracts. *l.* ovate, acuminate, with a tendency to become three-lobed. Brazil, 1887. Greenhouse shrub.

H. Cooperi (Cooper's). A form of *H. Rosa-sinensis*.

H. crassinervis (thick-nerved). *fl.* pink, scarcely ½in. long; peduncles solitary, axillary, remote or clustered at the ends of the branches. *l.* about 1in. long, less than ½in. broad, shortly petiolate, sub-cordate, oblong-ovate, coarsely serrated, with prominent nerves. Tropical Africa.

H. c. flammeus (flame-like).* *fl.* fiery-red; peduncles long. *l.* cordate, glandular. Abyssinia, 1893. Best treated as a half-hardy annual; perennial when grown under glass.

H. esculentus (edible). Gombo; Okra. *fl.* yellow, with a crimson centre; peduncles about 1in. long, solitary, axillary. Summer. *fr.* 6in. to 10in. long, pyramidal-oblong, glabrescent, edible. *l.* cordate, three- to five-lobed; lobes oblong, toothed; petioles 6in. long, bristly. *h.* 2ft. to 3ft. India, &c. A half-hardy annual, cultivated in many countries for its fruits.

H. e. speciosus (showy).* *fl.* sulphur-yellow, large, blotched with blood-red at the base of the petals. 1894. A handsome, hardy annual. (R. G. 1894, p. 622, f. 111.)

H. grandiflorus (large-flowered). A synonym of *H. heterophyllus*.

H. hastatus (spear-shaped). A synonym of *H. militaris*.

H. heterophyllus (variable-leaved). *fl.* white, with a purple centre, large, on short pedicels in the upper axils. *l.* entire or deeply three-lobed, lanceolate or elliptic-oblong, 5in. to 6in. long, usually serrated or crenulate, sometimes white beneath. Branches often prickly. *h.* 6ft. Australia, 1803. Greenhouse shrub. (B. R. 29.) SYN. *H. grandiflorus* (Gn. 1835, ii., 478).

H. lasiocarpus (woolly-fruited). *fl.* resembling those of *H. Moscheutos*. *fr.* more or less densely hairy. *l.* broadly ovate, more or less cordate at base, nearly equally tomentose on both surfaces. North America. Half-hardy shrub.

H. l. occidentalis (Western). *fr.* pubescent rather than hairy. *l.* more uniformly cordate at base. Chihuahua and California, 1838. (G. & F. 1838, i., p. 425, f. 68.)

H. Lebelei (Lebele's). *fl.* lemon-yellow, large, with reddish-brown blotches at the base of the corolla. *l.* palmate digitate. *h.* 3ft. to 4½ft. China, 1893. An unbranched, half-hardy annual.

H. lilacinus (lilac). A synonym of *Fugosia hakeæfolia*.

H. liliiflorus (Lily-flowered). *fl.* scarlet, axillary, forming a kind of corymb; calyx segments five. Summer. *l.* oblong-lanceolate, coriaceous, entire or divided into three to five lobes. *h.* 3ft. to 6ft. Isle of Bourbon, 1819. (B. R. 1995.) Of this greenhouse tree there are several pretty varieties.

H. Manihot (Manihot). *fl.* sulphur-yellow, purple in the centre, 6in. or more in diameter; petals roundish, abruptly narrowed at base. Summer and autumn. *l.* palmately divided nearly to the base; lobes five to seven, often 1ft. long, linear, acuminate, coarsely toothed. India, &c., 1715. Greenhouse perennial. (B. M. 1702, 3152; Gn., 1893, i., p. 126, t. 1157.)

H. micranthus (small-flowered). *fl.* white or pink, ½in. across, axillary; corolla reflexed. *l.* ovate or oblong, glandless, ½in. to 1in. long, entire or serrated, rough with bristly hairs. Branches slender, rod-like, spreading, stellate-bristly. India, &c. Stove shrub. The form *roseus* has rose-coloured flowers. Abyssinia, 1895.

H. Moscheutos. Swamp Rose Mallow. SYN. *H. palustris* (of Linnæus). Of this species there are one or two varieties with white or pinkish-white flowers.

H. multifidus (much-cleft). A synonym of *Fugosia hakeæfolia*.

H. mutabilis (changeable). *fl.* white or pink on first opening in the morning, becoming deep red by night, 3in. to 4in. across; peduncles axillary, 4in. to 5in. long. *l.* downy, five-angled, 4in. across, cordate, toothed; petioles 3in. long. China (cultivated in India), 1690. A small, greenhouse tree, without prickles. There is a double-flowered form.

H. palustris (marsh-loving), of Linnæus. A synonym of *H. Moscheutos*.

H. palustris (of Thore). A synonym of *H. roscus*.

H. Patersonii (Paterson's). A synonym of *Lagunaria Patersonii*.

H. Rosa-sinensis intermedius (intermediate). A garden hybrid between *H. R.-s. magnificus* and *H. schizopetalus*. 1883.

H. R.-s. kermesinus (carmine). *fl.* rich carmine-crimson, large; petals broad, rounded, undulated, outer ones reflexed, central ones erect, the innermost series consisting of the transformed column developed into numerous petaliferous lobes bearing stamens on their margins. South Sea Islands.

H. R.-s. magnificus (magnificent).* *fl.* bright rosy-magenta, shaded crimson, the base of each petal blotched chocolate.

H. R.-s. subviolaceus (partly violet).* *fl.* bright rose-colour, lightly striped with violet, dark purple at the base of the divisions, double. 1885. An ornamental variety.

Hibiscus—*continued.*

H. surattensis (Surat). *fl.* yellow, with a dark purple centre, about 1½in. across, axillary, solitary; bracteoles having a spathulate appendage; peduncles equalling the petioles. July to September. *l.* orbicular, about 16in. in diameter, deeply and palmately three- to five-cleft. India, &c., 1731. A weak-stemmed, stove, trailing plant, covered with soft hairs and with scattered prickles. (B. M. 1356; G. C. 1891, ix., p. 529, f. 105.)

H. syriacus. In addition to the varieties named in Vol. II., the following are worthy of recognition: COMTE DE HAINAULT, LADY STANLEY, LILACINA PLENA, and PAINTED LADY.

H. ternatus (ternate), of Cavanilles. A synonym of *H. Trionum.*

H. venustus (charming).* *fl.* cream-yellow, about 3in. in diameter. *l.* orbicular, about 17in. across, lobed. Tahiti (?). 1891. A handsome, tall, stove shrub, nearly allied to *H. mutabilis.* (B. M. 7183.)

HICKORY PINE. *See* **Pinus Balfouriana.**

HICORIAS. A synonym of **Carya** (which *see*).

HIDALGOA (after Hidalgo, a Mexican naturalist). ORD. *Compositæ.* A small genus (three species) of greenhouse herbs or under-shrubs, natives of Brazil and Costa Rica. They are closely allied to *Dahlia* and *Coreopsis*, but differ from both in habit, in the large fertile achene of the ray flowers, and in the sterile disk flowers, the styles of which are entire or very shortly two-lobed. *H. Wercklei*, the only species introduced, should be treated as a perennial; it climbs by means of the long petioles, which twist round objects of support.

H. Wercklei (Carlo Werckle's).* *fl.-heads* solitary, 2½in. across; ray florets about ten, bright scarlet above, dirty yellow beneath, three-toothed, spreading, oblong; disk yellow; peduncles axillary, solitary. July. *l.* opposite, broadly ovate, pinnately ternatisect, 1½in. to 2½in. long, the teeth tipped with reddish-brown. Costa Rica, 1898. (B. M. 7684.) SYN. *Childsia Wercklei.*

HIDE-BOUND. Another name for the condition known as **Bark-bound** (which *see*).

HIERACIUM. Including *Pilosella.* To the species described on p. 143, Vol. II., the following should be added:

H. maculatum (spotted). *fl.-heads* yellow, cymose; florets toothed. Summer and autumn. *l.* ovate-lanceolate, strongly toothed, hairy, strongly speckled with black. Stem branched, many-leaved. *h.* 1½ft.

H. villosum (villous).* *fl.-heads* yellow, large, with glabrous rays. July. *l.* membranous, silvery-glaucous, almost entire; upper cauline ones ovate or oblong, sub-amplexicaul; radical ones oblong-sessile. Stems slightly branched, few-headed, leafy. *h.* 1ft. Germany, Switzerland, &c. Plant white-villous, rather handsome. A good plant for withstanding drought.

HIEROCHLOE. To the species described on p. 143, Vol. II., the following should be added:

H. redolens (scented). *fl.*, panicle 6in. to 10in. long, nodding; branches capillary, slightly hairy, the lower ones 2in. to 3in. long. *l.* flat, quite smooth or slightly scabrid; ligule broad, membranous. Culms densely tufted, 2ft. to 3ft. high. Tasmania, &c. (in wet places), 1832.

HIGGINSIA (of Blume). A synonym of **Petunga** (which *see*).

HIG TAPER. *See* **Verbascum Thapsus.**

HILLEBRANDIA (named in honour of Dr. Hillebrand, a botanist at Hawaii, who sent dried specimens of the plant to Kew in 1865). ORD. *Begoniaceæ.* A monotypic genus. The species is a tall, branched, succulent, stove herb, everywhere sparsely clothed with long, reddish hairs. For culture, *see* **Begonia.**

H. sandwicensis (Sandwich Isles). *fl.* white, tinged rose, or more or less rosy, about ¼in. in diameter, the females bibracteolate; sepals five, ovate, sub-acute, the outer ones rather larger; petals five, spathulate, concave, membranous; stamens many, free; peduncles 6in. to 12in. long, dichotomously branching, and bearing bisexual cymes. May. *l.* 4in. to 8in. long and broad, obliquely rounded and deeply cordate, with a very narrow sinus, and overlapping basal lobes. *h.* 3ft. to 4ft. Sandwich Isles, 1836. (B. M. 6953.)

HILL GOOSEBERRY. *See* **Rhodomyrtus tomentosa.**

HILLIA. To the species described on p. 144, Vol. II., the following should be added:

H. tetrandra (four-anthered). *fl.*, corolla tube 1in. to 1½in. long, the four lobes roundish-obovate, one-third or one-quarter as long as the tube. June. *l.* obovate or spathulate-lanceolate, cuneate at base, rounded at apex, 1½in. to 2½in. long. Roots bearing small tubers. *h.* 3ft. to 4ft. Jamaica, 1793. (B. M. 7355.)

HIMANTOGLOSSUM. Included under **Orchis** (which *see*).

HIMANTOPHYLLUM. *See* **Clivia** and **Imantophyllum.**

HIMATANTHUS. A synonym of **Plumeria** (which *see*).

HIP. A common name for the fruit of a Rose.

HIPPEASTRUM. Knight's Star. Including *Habranthus* and *Phycella.* J. G. Baker limits the number of species to thirty-eight. Flowers usually bright red or whitish; perianth-tube often furnished with minute scales or a distinct neck at the throat; stamens inserted at the throat of the tube, more or less declinate. Leaves linear or lorate. Rootstock a bulb with membranous tunics. Many plants formerly classed under *Amaryllis* are now known as Hippeastrums.

FIG. 446. HYBRID HIPPEASTRUM.

So great has been the advance made by florists with the lovely hybrids belonging to this genus (Fig. 446) that the time-honoured species are now relegated to the background. Not only are the flowers themselves more diversified as to colour, but the foliage is far stronger than in the older kinds. Coming, as the flowers do, at a dull season of the year, they are much in request as pot-plants for table and other indoor decoration, especially, too, as being of excellent substance they last a long time in perfection.

To the species described on p. 145, Vol. II., the following should be added. They require stove treatment.

H. advenum (foreign). *fl.* yellow or red, horizontal or ascending, 1½in. to 2in. long; segments ½in. broad; umbel two- to six-flowered; peduncle 6in. to 12in. long. December and January. *l.* linear, 1ft. long, glaucous-green. Bulb 1½in. in diameter. Chili. SYNS. *Amaryllis advena* (B. M. 1125; B. R. 849), *Eustephia Macleanica* (Ref. B. 332).

H. a. pallidum (pale). The correct name of *H. miniatum.*

H. ambiguum is a form of *H. solandriflorum.*

H. Andreanum (André's).* *fl.* pale red, striated with dark red, four to six in an umbel; spathe pink; perianth 4in. long, with a short tube; scape 1ft. to 1½ft. long. *l.* lorate, appearing after the flowers. Cordilleras and Colombia, about 1876. SYN. *Amaryllis Andreana* (of gardens).

H. Arechavaletæ (Mme. Arechavalet's). *fl.* three in an umbel; perianth white, banded with crimson, 4in. long, 2½in. broad; scape 2ft. high. Monte Video, 1898. This is very near *A. vittatum*, only differing in having the margins of the perianth segments plain.

Hippeastrum—*continued.*

H. Bagnoldi (Bagnold's). *fl.* yellow, tinged with red, erect or nearly so, 1½in. to 2in. long; tube very short; segments ½in. broad; umbel four- to six-flowered; peduncle 1ft. long. *l.* linear, glaucous, 1ft. long. Bulb 2in. in diameter, the tunics nearly black. Coquimbo. SYN. *Habranthus Bagnoldi* (B. R. 1396).

H. B. punctatum (dotted). *fl.*, perianth drooping, the tube green, the segments milky-white, with copious small, red dots, spreading, revolute at apex. Chili, 1885. SYN. *Habranthus punctatus* (R. G. 1163, f. 3).

H. bicolor (two-coloured). *fl.* bright red, passing to yellowish-green towards the base, ascending, narrowly funnel-shaped; umbel four- to nine-flowered; peduncle slender, 1ft. to 1½ft. long. October. *l.* about four, contemporary with the flowers, linear, obtuse, 1½ft. to 2ft. long. Bulb globose, 2in. in diameter. Chili. SYNS. *Amaryllis cyrtanthoides* (B. M. 2393), *A. ignea* (B. R. 809), *Phycella biflora* (B. R. 1943).

H. b. magnifica (magnificent). *fl.*, perianth limb 3in. long.

H. bifidum (bifid). *fl.* bright red, erect or nearly so, about 2in. long; tube very short; segments obtuse, ½in. broad; umbel three- to six-flowered; peduncle 1ft. long. March. *l.* two or three, linear, slightly glaucous, 1ft. long, produced after the flowers. Bulb 1½in. in diameter. Buenos Ayres, 1825. SYNS. *Habranthus angustus* (B. M. 2639), *H. bifidus* (B. M. 2599), *H. intermedius* (B. R. 1143), *H. kermesinus* (B. R. 1638).

H. brachyandrum (short-anthered).* *fl.* pale pink, deep blackish-red at the base of the segments, nearly erect, 3½in. long; tube short, funnel-shaped; segments acute, ½in. broad; stamens less than 1in. long; umbel one-flowered; peduncle slender, 1ft. long. South Brazil, 1890. (B. M. 7344.)

H. brasiliense (Brazilian). A garden synonym of *H. rutilum fulgidum.*

H. calyptratum (calyptrate). *fl.* pale yellow, reticulated with green; tube ¾in. long; limb 4in. long, the segments oblong-unguiculate, acute, 1½in. to 1¾in. broad; umbel two- or three-flowered; peduncle 2ft. long. May. *l.* five or six, lorate, acute, bright green, 1½ft. to 2ft. long. 2in. broad. Bulb 3in. in diameter. Brazil, 1816. SYN. *Amaryllis calyptrata* (L. B. C. 864).

H. Cybister (Cybister). Tumbler Sprekelia. The correct name of *Sprekelia Cybister* (F. d. S. 455-6).

H. equestre splendens (splendid).* *fl.* larger than in the type, and having broader perianth segments. 1895. (R. H. 1895, p. 577.)

H. e. Wolteri (Wolter's). *fl.* of a beautiful cinnabar-red or scarlet, 5in. to 6in. in diameter. Costa Rica, 1895. (R. G. 1895, p. 20, f. 49, under name of *H. Wolteri.*)

H. fulgidum (bright). A form of *H. rutilum.*

H. Leopoldi (King of the Belgians'). *fl.*, tube short; limb very regular, 5in. long, 6in. to 7in. across, the segments 2in. broad, white towards the tip, bright red in the middle, with a bifid white keel in the lower half of the red, and a large, greenish-white throat; peduncle stout. *l.* lorate, 1½ft. to 2ft. long. Bulb 2in. to 3in. in diameter. Andes of Peru, 1869. (F. M., t. 475-6.) SYN. *Amaryllis Leopoldi* (G. C. 1870, p. 733, f. 140).

H. Muesserianum (Muesser's). *fl.*, perianth segments salmon-colour, tinted with rose, narrow. Brazil, 1896. This species is nearly allied to *H. auticum.* (I. H. 1896, p. 376, t. 72.)

H. phycelloides (Phycella-like). *fl.* bright red, with a yellowish centre, erect; perianth tube ¾in. long; segments oblanceolate; scape 6in. to 12in. long, three- to six-flowered. *l.* three or four, long-linear, glaucous, appearing with the flowers. Chilian Andes. 1830. SYN. *Habranthus phycelloides* (B. R. 1417).

H. procerum (tall). *fl.* lilac, four to twelve in an umbel; tube very short; limb 5in. to 6in. long, the segments less than 1in. broad; peduncle 1ft. to 1½ft. long, ancipitous, 1in. to 1¼in. in diameter. Winter. *l.* about a dozen, distichous, falcate, ensiform, 2ft. to 3ft. long, 1½in. to 2in. broad. Bulb large, with a long neck. South Brazil, 1863. A very distinct species. SYNS. *Amaryllis procera* (F. d. S. 2077-8), *A. Rayneri* (B. M. 5833).

H. pulverulentum. The correct name is *H. rutilum acuminatum.*

H. pyrrochroum is merely a variety of *H. equestre.*

H. Reginæ (Queen's).* Mexican Lily. *fl.* two to four in an umbel; tube ¼in. to ⅓in. long; throat having a large, greenish-white star; limb bright red, 4in. to 5in. long, the segments 1in. to 1¼in. broad. May. *l.* fully developed after the flowers, 2ft. long, 1¼in. broad. Bulb 2in. to 3in. in diameter. Mexico and the West Indies, 1725. SYN. *Amaryllis Reginæ* (B. M. 453).

H. rutilum (red).* *fl.* two to four in an umbel; tube green, ¾in. long; limb 3in. to 4in. long, the segments bright crimson, with a green keel extending half-way up, ¾in. to 1in. broad, filaments red; peduncle 1ft. long. *l.* six to eight, lorate, 1ft. to long. Bulb 2in. to 3in. in diameter. South Brazil, 1810. SYN. *Amaryllis rutila* (B. R. t. 23; L. B. C. 1449).

Hippeastrum—*continued.*

H. r. acuminatum (taper-pointed). The correct name of *H. pulverulentum.*

H. r. fulgidum (bright).* The correct name of *H. subbarbatum.* SYN. *H. brasiliense* (of gardens).

H. sub-barbatum. The correct name is *H. rutilum fulgidum.*

H. Wolteri (Wolter's). A variety of *H. equestre.*

The following list of hybrids include kinds which are sure to give satisfaction:

ALFRED HENDERSON, crimson-scarlet, maroon centre; ASPASIA, white, feathered with scarlet, and elegantly banded; BEETHOVEN, light orange, veined white; CONQUEROR, crimson-scarlet, large; ECLIPSE, white, striped scarlet; ELDORADO, orange-scarlet, with dark veinings; EMPRESS OF INDIA, scarlet, with white rays; FIGARO, crimson, with grey eye; MAJOR WILSON, bright scarlet; MATCHBOX, white, veined orange-scarlet, barred white; MISS AMALIE, white, blotched and veined rosy-pink; SOUTHEY, scarlet, rayed white and green; THE VIGIL, white, with red markings.

HIPPION. A synonym of **Enicostema** (which *see*).

HIPPOBROMA. Included under **Isotoma** (which *see*).

HIPPOCASTANUM. A synonym of **Æsculus** (which *see*).

HIPPOGLOSSUM (of Breda). A synonym of **Cirrhopetalum** (which *see*).

HIPPOGLOSSUM (of Hartmann). A synonym of **Mertensia** (which *see*).

HIPPOPHAE. The species formerly known as *H. argentea* and *H. canadensis* are now classed under **Shepherdia.**

HIPTAGE (from *hiptamai*, to fly; in reference to the three-winged samaræ). SYNS. *Gærtnera* (of Schreber), *Molina.* ORD. *Malpighiaceæ.* A small genus (about four species) of stove, climbing shrubs, found in tropical Asia. Flowers white, fragrant, in terminal and axillary, sometimes compound racemes; calyx five-parted; petals clawed; peduncles erect; stamens ten, declinate. Leaves opposite, coriaceous, entire, petiolate, glandless; stipules wanting. The species thrive in a compost of peat and loam, and may be increased by cuttings.

H. Madablota (native name). The correct name of *Gærtnera racemosa.*

H. obtusifolia (obtuse-leaved). The correct name of *Gærtnera obtusifolia.*

HIRÆA (named in honour of De la Hire, a French botanist). ORD. *Malpighiaceæ.* A genus embracing about fifty species of stove shrubs, often climbing, natives of tropical America. Flowers small. Leaves entire. Several of the species have been introduced, but it is doubtful if any are now in cultivation.

HIRCULUS. Included under **Saxifraga** (which *see*).

HOAREA. Included under **Pelargonium** (which *see*), the correct name of *H. atra* being *P. hirsutum melananthum.*

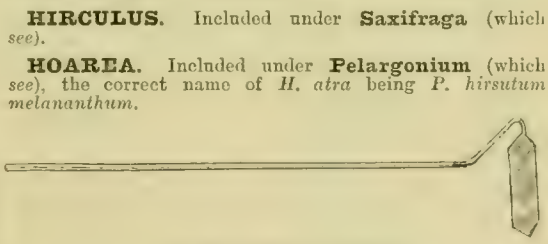

FIG. 447. SPROUGHTON HOE.

HOES AND HOEING. The Hoe illustrated at Fig. 447 is a really improved Dutch Hoe, as it is worked in the same way with the advantage that, having a double edge, it may be effectively moved either backwards or forwards. When the person using the Hoe is standing up, the flat of the blade lies on the surface of the ground, and is easily moved backwards or forwards without bending the back. Another advantage is that the Hoe is self-cleaning, *i.e.*, does not clog with soil if it is damp, and works itself bright quickly, doing its work expeditiously and well. If it is desired to remove any large or noxious weed by the roots, the pointed end is very handy for that purpose.

HOFFMANNIA. To the species described on p. 147, Vol. II., the following should be added:

H. phœnicopoda (purple-footed). *fl.* inconspicuous. *l.* ovate-oblong, acute, dark green above, violet-red on the under-surface. Central America (?), 1898.

HOFFMANSEGGIA (named in honour of J. F. Hoffmansegg). ORD. *Leguminosæ*. A genus embracing about fourteen species of dwarf, mostly stove herbs or under-shrubs; two are South African and the rest American. They are very closely allied to *Cæsalpinia*. Two of the species have been introduced, but it is doubtful if they are still in cultivation.

HOG NUT. *See* **Carya porcina.**

HOHENBERGIA. This genus is included under **Æchmea** (which *see*).

H. capitata (headed). A synonym of *Æchmea exsulans.*

H. erythrostachys (red-spiked). A synonym of *Æchmea glomerata.*

H. Legrelliana (Legrell's). A synonym of *Ortgesia Legrelleana.*

HOLARRHENA (from *holos*, entire, and *arrhen*, a male; in allusion to the anthers). ORD. *Apocynaceæ*. A genus embracing seven or eight species of stove trees or shrubs, found in tropical Asia and Africa, and allied to *Tabernæmontana*. Flowers white, cymose. Leaves opposite, membranous. *H. antidysenterica* (SYNS. *H. villosa*, *Chonemorpha antidysenterica*) has been introduced, but is not in general cultivation.

HOLBŒLLIA. This genus is monotypic, *H. acuminata* being now regarded as merely a variety of *H. latifolia* (with which species *Stauntonia latifolia* is synonymous).

HOLCOCHLÆNA. Included under **Pellæa** (which *see*).

HOLLY, AMERICAN. *See* **Ilex quercifolia.**

HOLLYHOCK. In certain positions in the garden no other flower is so effective as the Hollyhock, but it has not been so popular in recent years as it used to be, because of the difficulty in cultivating the plants owing to the disease. If clean plants can be obtained, say, in the autumn, they should be wintered in frames, and the pots plunged to the rims in cocoa-nut fibre or similar material. They are usually wintered in small-sized flower-pots, and in the spring repotted in 5in. and 6in. size. In April they may be planted out where they are to flower. The Hollyhock is a very gross-feeding plant, and requires a rich, deep soil. The ground ought always to be well trenched and manured during the winter, when it is usually in good condition at planting time in the spring.

It is a good thing when putting out the plants to have at hand a barrow-load of good prepared compost, such as is used in the potting-shed: a little of it should be placed around the ball of the roots as the plants are turned out of the pots; this gives them a good start. A stout stick, standing some 6ft. out of the ground, will be required, and it is best to put the sticks into the ground at once, and plant the Hollyhocks up to them, fastening the stems to them at the same time. The plants soon start into rapid growth, and must be fastened to the sticks as growth progresses. As soon as dry weather sets in, the plants should be freely watered, and some decayed manure placed around the base to prevent undue evaporation.

Some cultivators remove the lateral growths, so that the centre spike may be of splendid quality. Such growths are furnished both with eyes containing leaf-buds, and with flower-buds. The leaf-buds, if cut out and inserted in small pots in sandy soil, will produce nice young plants. They should be treated much as vine eyes are. The small pots should be plunged in a spent hot-bed, when the bud will, in a week or ten days, come through the soil. Great care must be taken in watering them at this stage, as they have considerable tendency to rot off; but as the plants advance in growth and form roots, they should be potted on into large "sixties," and in these they will pass the winter, but must be potted on in the early spring months.

Hollyhocks are also propagated in the spring by root-grafting, and by cuttings from growths obtained from the old stools. To obtain these the old plants should be lifted out of the ground in October, and planted in flower-pots from 6in. to 8in. in diameter; there is no need to over-pot them. The plants may either be

Hollyhock—*continued.*

wintered in a garden-frame or in a cool greenhouse, and in February or March the cuttings will be ready. Each one should be taken with a sharp knife close to the main stem of the plant, and potted in "thumbs" in sandy soil. If the soil is moist, and the cuttings are placed in the propagating-frame of a forcing-house, they will require little or no water until roots are formed, and an over-supply of water might cause most of them to rot off at the base. They will soon start into growth if they do well, and must, of course, be inured to a more airy place as soon as possible.

Root-grafting is merely the process of tying the shoot to a bit of Hollyhock root, after cutting the growth and the root much in the same way as ordinary whip-grafting of fruit-trees. Growths should be planted in small flower-pots, deep enough to leave the point of union just above the surface. These spring-propagated plants will flower rather later than those struck from eyes or in any other way in the autumn.

Propagation from seed is much the easiest way to raise a stock of Hollyhocks, and, of course, it is always best to save the seed from the very best varieties. Such plants should also be cross-fertilised, for if this is not done the seedlings produce flowers differing very little from the parent plant, most of them inferior in quality, but some equally good, and very few of them better. If the seed is sown soon after it is gathered and dried, and the plants are preserved through the winter in garden-frames, they will flower strongly the following season; but if the seed is obtained during the winter, it is as well to sow it in May or June, planting the seedlings, when strong enough, where they are to flower. Seedlings when planted out require exactly the same treatment as the named varieties.

In hot, dry seasons, the leaves of Hollyhocks become much damaged by Red Spider, which attacks the undersides of the leaves. The best way to destroy it is to syringe freely. This may be done frequently by the use of clean rain-water, and the mechanical action of the water will dislodge the pest. Tobacco-water effectually destroys it.

Varieties. Several fine additions to the list of named varieties of Hollyhocks have been made within recent years. Some of the best are as follow:

Doubles. ALETHA SMITH, pink, sometimes tinted with buff; ALFRED CHATER, rose mottled, good form; APOLLON, cherry-rose; AQUILA, deep purple; BEAUTY, rosy-lilac; BLACK KNIGHT, very dark maroon; CRIMSON KING, bright crimson; CRIMSON QUEEN, deep crimson (one of the best); DELICATISSIMA, cream, on a darker ground; EUCLID, deep yellow, tinged bronze; EXULTIM, blackish-maroon; JAMES ALLEN, deep claret; MARY RAMSAY, flesh pink; MULBERRY GEM, reddish-mulberry; OVID, bright cerise; PURPLE PRINCE, rich purple; QUEEN OF THE WHITES; VAQUERO, primrose; WALDEN PRIMROSE, light primrose, with chocolate base.

Singles. ATHELSTANE, dark claret; LANGPORT RIVAL, crimson, with wavy petals; MARJORY, deep claret; PARRET PRIDE, soft puce, with rose-coloured centre; SULPHUR QUEEN, pale yellow; WEARNE WYCHE, white, with pink centre.

HOLLYHOCK FUNGUS (*Puccinia malvacearum*). In addition to the preventive measures suggested in Vol. II., p. 149, weak Bordeaux Mixture should be sprayed upon the diseased plants. Condy's Fluid, used in the proportion of 2 gills to each ½ gallon of water, has proved very effectual. All dead and decaying leaves should be collected and burned.

HOLLY-LEAF FLY (*Phytomyza ilicis*). This pest is far more debilitating to Hollies than is generally supposed, as in bad attacks the leaves are shed in quantities. When this is the case the cast foliage should be collected and burned, and just prior to the appearance of the perfect insects next season the trees should be syringed with a solution of soft soap and quassia.

HOLOSCHŒNUS. Included under **Scirpus** (which *see*).

HOLOTHRIX (from *holos*, whole, and *thrix*, hair; in reference to the stem being covered with hairs). ORD. *Orchideæ*. A genus embracing about eighteen species of stove or greenhouse, terrestrial Orchids, natives of tropical and South Africa and Madagascar. Flowers small, in slender, usually secund spikes: sepals sometimes hairy; petals entire or variously divided at apex

Holothrix—*continued.*

lip erect or spreading, divided at apex into from three to many segments, produced at base into a spur; scapes slender, usually hairy, and without sheaths. Leaves one or two, sessile, ovate or orbicular-reniform, radical. Two of the species have been introduced. They thrive in a mixture of peat, sphagnum, and charcoal, and require the temperature of a warm greenhouse.

H. Lindleyana (Lindley's).* *fl.* white, racemose; scape slender; lip five-lobed, with an inrolled spur. *l.* ovate, spreading on the ground. South Africa, 1838. A pretty little Orchid. (G. C. 1838, iii., p. 364, f. 56.)

H. orthoceras (straight-spurred). *fl.* white, striped with purple, numerous; scape purple, erect, 6in. long. *l.* ovate, 2in. long, green, with grey reticulations. South Africa, 1897. (B. M. 7523.)

HOLY HERB. *See* **Verbena officinalis.**

HOLY THISTLE. *See* **Silybum Marianum.**

HOMALANTHUS. SYNS. *Duania, Omalanthus.* Including *Dibrachion* (of Regel). To the species described on p. 149, Vol. II., the following should be added:

H. giganteus (gigantic). *fl.*, female pedicels becoming very long, nearly thrice exceeding the rigid bracteate males. *l.* densely pubescent beneath. Otherwise resembling *H. Leschenaultianus.* Java, 1866. SYNS. *Carumbium giganteum, Dibrachion peltatum* (R. G. 1866, p. 100, t. 504).

H. Leschenaultianus (Leschenault's). The correct name of *H. populifolius.*

HOMALIUM (from *homalos*, even, consistent; the stamens in some of the species are regularly divided into fascicles). Including *Astranthus.* ORD. *Samydaceæ.* A genus embracing about thirty species of stove trees or shrubs, natives of Asia, Africa, and North Australia. One or two of them have been introduced, but they are probably not now seen outside botanical collections.

HOMALOMENA. SYN. *Zantedeschia* (of Sprengel), in part. **Chamæcladon** (which *see*) is included in this genus by Sir J. D. Hooker, in the "Flora of British India." Flowers borne on an inappendiculate spadix, which is included in the spathe and often shortly stipitate, the male inflorescence cylindrical or fusiform, the female shorter and narrower; spathe straight, cylindrical or convolute below, the lamina convolute or gaping, acuminate. Leaves ovate- or triangular-cordate or lanceolate; petioles often elongated and long-sheathing. To the species described on p. 149, Vol. II., the following should be added:

H. insignis (remarkable).* *fl.*, spathe green, 3½in. to 4in. long, obtusely keeled at back, the apex compressed-rostrate; spadix white, 3in. long. *l.* 1ft. long, 6in. broad, elliptic-oblong, obtuse and shortly mucronate, rounded at base, green above, suffused purple beneath; petioles fuscous-purple, channelled, 3in. to 5in. long, sheathed to the middle. Borneo, 1885. (L. H. 1885, t. 560.)

H. rubescens is the correct name of *H. rubra.*

H. Siesmeyeriana (Siesmeyer's). *fl.*, spathe purplish-red outside, white within, the tube and limb indistinguishable; peduncle purplish-red. *l.* slightly sagittate, the veins, midrib, and margin beneath tinted red; petioles purplish-red, long, glabrous. Malaya, 1885.

HOMALOPETALUM (from *homalos*, flat, and *petalon*, a petal; the middle petal [lip] is like the lateral ones). ORD. *Orchideæ.* A monotypic genus. The species is a tiny, stove Orchid, allied to **Tetramicra** (which *see* for culture).

H. jamaicense (Jamaica). *fl.* solitary on peduncles 1in. long; segments ¼in. long, linear. *l.* ovate, ¼in. long. Pseudo-bulbs ¼in. long. Rhizomes creeping. Jamaica, 1896.

HOMERIA. Six species are included in this genus. Perianth segments free to the base, connivent in a cup, then spreading; filaments united in a cylindrical tube; spathes cylindrical, few-flowered. Leaf (usually) solitary, overtopping the flowers. To the species described on p. 149, Vol. II., the following should be added:

H. aurantiaca is a variety of *H. collina.*

H. collina miniata (scarlet). *fl.* of a tawny red with a yellow centre; scape 12in. to 20in. high, bearing several fascicles of flowers. *l.* one or two, rigid, linear, without any central band. (S. B. F. G. 152.) SYN. *Moræa miniata* (A. B. R. 404).

H. c. ochroleuca (yellowish-white). *fl.* of a pale yellow. (B. M. 1103, under name of *H. ochroleuca.*)

H. flexuosa (bending). A synonym of *Hexaglottis longifolia.*

HOMOGYNE ALPINA. *Petasites alpina* is synonymous with this species.

HOMOPTERA. *See* **Insects.**

HOMOS. In Greek compound words this term means similar; *e.g.*, Homocarpous, having fruits all of one kind.

HONCKENYA PEPLOIDES. A synonym of **Arenaria peploides** (which *see*).

HONDBESSEN. A synonym of **Pæderia** (which *see*).

HONEY AGARIC. This very conspicuous fungus, known scientifically as *Agaricus melleus* and *Armillaria mellea*, may be found upon many orchard trees as well as upon Conifers in large numbers in August and later, and is responsible for the disease known as Tree-Root Rot. It grows alike as a saprophyte and as a parasite, and the clusters of pale yellow sporophores, or mushrooms, are very familiar. It is a most destructive fungus to trees on which it finds lodgment. Indeed, the only compensating influence that the fruit-grower has in connection with the pest, is that the mushrooms are edible, if of somewhat peculiar flavour. Care should be taken that trees do not receive external injury, as when this is the case the spores which are distributed when ripe find a congenial resting-place and start the trouble in what was previously a non-infected area; or, again, the fungus may gain access by means of black, stringlike mycelium spreading from the roots and eventually working between the bark and the wood. If the bark be damaged the wood should be coated with tar at once.

It is practically useless adopting remedial measures when once a tree is attacked, and the endeavour must rather be to prevent, as far as possible, the spread of the trouble. Hartig, in his "Diseases of Trees," recommends digging narrow trenches some distance from the trunk, and thus preventing the extension by means of the mycelium already referred to. Where old tree-stumps have been allowed to remain, and the sporophores are growing thereon, they should be collected before the spores can be distributed, and either eaten or burnt. Further, the stumps should be removed. On no account should the "toadstools," as they are frequently termed, be kicked off the trees, as is frequently done. *See also* **Pinus—Fungi**, where the pest is illustrated.

HONEY FLOWER, CAPE. *See* **Protea mellifera.**

HONEY GARLIC. *See* **Nectaroscordum.**

HONEYSUCKLE, BUSH. *See* **Diervilla.**

HONEYSUCKLE, JAMAICA. *See* **Passiflora laurifolia.**

HOOP ASH. *See* **Celtis crassifolia.**

HOOP WITHY. *See* **Rivina.**

HOP AND PLUM APHIS (*Phorodon humuli*). *See* **Aphides** and **Phorodon.**

HOP-DOG. *See* **Tussock Moths.**

HOPEA. Included under **Symplocos** (which *see*).

HOPKIRKIA (of Sprengel). A synonym of **Salmea** (which *see*).

HOPLOCAMPA TESTUDINEA. *See* **Apple Sawfly.**

HOPLOPHYTUM. Included under **Æchmea** (which *see*).

HOP-TREE. *See* **Ptelea trifoliata.**

HORMIDIUM (from *hormos*, a necklace; in allusion to the small pseudo-bulbs clustered at the sides of the rhizome). ORD. *Orchideæ.* A genus embracing about seven species of dwarf, stove, tropical American, epiphytal Orchids, formerly included under **Epidendrum** (which *see* for culture). Flowers variously disposed; lateral sepals broader; petals like the dorsal sepal or very narrow; lip broadly connate with the base of the short column. Leaves small, coriaceous or slightly fleshy. *H. uniflorum* (SYN. *H. pygmæum*) and *H. Sophronitis* have been introduced, but it is doubtful if they are still in cultivation.

H. bicornutum (two-horned). A synonym of *Diacrium bicornutum.*

HORNED RAMPION. *See* **Phyteuma.**

HORNEMANNIA MARTINICENSIS. The correct name of **Vaccinium Imrayi** (which *see*).

HORNEMANNIA (of Bentham). Included under **Sibthorpia** (which *see*).

HORNET (*Vespa Crabro*). This, the largest of British Wasps, occasionally gives trouble to the gardener, as the insect shows a partiality for ripe fruit and especially Grapes. In collecting, too, material for its nest, the bark of several trees is laid under contribution. Against this, however, must be set off its utility in destroying noxious insects like Aphides, Scales, and the larvæ of undesirable Moths. In neighbourhoods where Hornets are found, a bottle of sweetened liquid hung up in the trees or in the fruit-house will prove attractive to the insects, which are far from common. *See* **Wasps,** Vol. IV.

HORNET FLY (*Asilus crabroniformis*). A large dipterous insect, belonging to the *Asilidæ*, sometimes known as Robber Flies and Hawk Flies. Their chief characteristics are: Head short and broad, eyes convex; mouth prolonged into a short, horny beak: antennæ three-jointed, variable; palpi small; legs stout and strong, with usually large feet and thick, blunt claws; hind-body long and tapering; wings large and powerful. All the family *Asilidæ* are exceedingly voracious insects, capturing their prey alive, and then driving the horny beak into the victim, which may consist of anything from small Moths and Wasps to the fierce Tiger Beetles and the giant Dragonflies. The larvæ live in the soil, and subsist largely upon beetles.

A. crabroniformis is a strikingly bold insect, and on account of its hairy covering and yellow-and-black dress it might at a superficial glance pass for a Hornet or even a Bee. This insect is found in many parts of England, especially near the coast, where we have seen it hawking in gardens for prey. In Sark it is very common. The insects are extremely useful to the gardener and farmer, and should never be killed. They are harmless to man despite their formidable appearance.

HORSE CHESTNUT, SMOOTH-FRUITED. *See* **Pavia.**

HORSE GENTIAN. *See* **Triosteum.**

HORSE MANURE. The droppings of horses are richer in nitrogen than those of either cows or pigs, but not so rich as those of sheep; they have a somewhat denser texture, and cohere but loosely. For this reason they are readily distributed through the soil, and quickly decay; hence the nutrient elements become rapidly fit for absorption and assimilation by plants. The solid excrements of horses are less lasting than those whose action is slower.

HORSESHOE GERANIUM. *See* **Pelargonium zonale.**

HORSE THISTLE. *See* **Cnicus.**

HORT. *See* **Hortensis.**

HORTA. A synonym of **Clavija** (which *see*).

HORTENSIS OPULOIDES. A synonym of **Hydrangea Hortensia** (which *see*).

HORTICULTURE. The science of **Gardening** (which *see*).

HOSE-IN-HOSE. A term employed when the calyx of a gamopetalous flower partakes of the form of the corolla, or when the corolla consists of two parts or whorls—a condition often found in the Primrose.

HOST-PLANT. One which supports a parasite.

HOTEIA. A synonym of **Astilbe** (which *see*).

HOTTENTOT'S HEAD. *See* **Stangeria paradoxa.**

HOULLETIA. To the species, &c., described on pp. 153-4, Vol. II., the following should be added:

H. Landsbergi (Landsberg's). *fl.* fleshy, 3in. across; sepals orange, with small red spots; petals smaller and notched; lip white, tinged with purple, narrow, with four horn-like lobes; peduncle purplish, stout, 4in. long. September. *l.* 12in. long, 4in. broad, strongly ribbed. Pseudo-bulbs 1in. long. Costa Rica, 1891. Intermediate house. (B. M. 7362.)

H. Lowiana (Low's). *fl.* yellowish-white to cream-colour, with some deeper sulphur-yellow at the base of the lateral wings of

Houlletia—*continued.*

the hypochil, nearly as large as a crown piece, ivory-like in substance; peduncles usually bent forward or sideways, one- to three-flowered. *l.* cuneate-oblong-lanceolate, acute, plaited, unequal. Pseudo-bulbs short-pyriform, with some longitudinal wrinkles, two-leaved. Colombia, 1874.

H. odoratissima xanthina (yellow).* *fl.*, sepals and petals orange-yellow, the lip sulphur and white. 1884. A handsome variety.

HOUSE FUNGUS. A popular name sometimes employed for the destructive **Merulius lacrymans** (which *see*).

HOUSTONIA. *H. purpurea* is the correct name of *H. longifolia*. *H. serpyllifolia* (of B. M.) is probably a form of *H. cærulea*.

H. cærulea alba (white). A white-flowered variety of the type.

HOVEA. Including *Plagiolobium*, *Platychilum*, and *Poiretia* (of Smith). *H. Celsi* is the correct name of *H. elliptica*.

FIG. 448. HOWEA BELMOREANA.

HOWEA. Though this genus of Palms boasts but two species, *H. Belmoreana* (Fig. 448) and *H. Forsteriana*, they are both so attractive that they should be represented even if only as room plants, for which the latter is preferable. Both are very popular species with the trade.

HOYA. Including *Plocostemma*. To the species described on pp. 155-6, Vol. II., the following should be added:

H. gonolobioides (Gonolobus-like). *fl.* brownish, rotate, with ovate, obtuse lobes, umbellate; peduncles hispid. *l.* membranous, cordate-ovate, acuminate, hairy on both sides. Stem fulvous-hispid, climbing. India (?), 1884. A distinct plant.

H. Griffithii (Dr. W. Griffith's).* *fl.* externally pale and rather dull rose-red, with yellowish edges, paler and yellowish within, with three faint pink stripes on each segment, 1in. to 1½in. in diameter, numerous, umbellate on a stout peduncle, 1in. to 1½in. long. July. *l.* in distant pairs, 4in. to 10in. long, very shortly petiolate, elliptic or oblong-lanceolate or oblanceolate. Stem flexuous, climbing. Eastern Bengal, 1885. (B. M. 6877.) A fine species.

H. lasiantha (woolly-flowered). *fl.* yellow; corolla reflexed, densely stupose within at base; umbels very long-pedunculate, terminal. July. *l.* ovate, shortly cuspidate, obsoletely veined. Borneo, 1858. (B. M. 5031, under name of *Plocostemma lasianthum*.)

H. Lauterbachii (Lauterbach's). *fl.* dark brownish-red on the outer surface, emerald-green on the inner, large, and, as well as the leaves and stems, hairy. 1896.

Hoya—*continued.*

H. linearis sikkimensis (Sikkim). *fl.* waxy-white, pentagonally five-lobed, nearly ½in. in diameter, in terminal, ten- to thirteen-flowered umbels. *l.* soft, fleshy, terete, hairy. Stems weak and flaccid, pendulous, slender, softly hairy. Sikkim, 1883. A good basket plant. (B. M. 6682; G. C. n. s., xx., pp. 8-9.)

H. longifolia Shepherdi (long-leaved, Shepherd's).* The correct name of *H. Shepherdi.* (G. C. n. s., xxiv., p. 616.)

H. Shepherdi is a form of *H. longifolia.*

H. trinervis is a form of *H. Pottsii.*

H. viridiflora (green-flowered). *fl.* green; corolla ½in. in diameter, cup-shaped, the lobes triangular; umbels drooping, very many-flowered; peduncles 1in. to 3in. long. *fr.* covered with rusty dust. *l.* ovate, sub-orbicular, or cordate, acuminate, 3in. to 6in. long; petioles 1in. to 3in. long. India. The correct name of this plant is *Dregea volubilis.*

HUDSONIA. *H. Nuttallii* is synonymous with *H. ericoides.*

HUEGELIA (of Reichenbach). A synonym of **Trachymene** (which *see*).

HUERNIA. Several species have recently been discovered in tropical Africa. To those described on p. 156, Vol. II., the following should be added:

H. aspera (rough). *fl.* few in a sessile cyme; sepals greenish or purple, linear-subulate, spreading; corolla purple, nearly 1in. in diameter and as long, campanulate, the lobes very short, broadly triangular, acute; column very short; outer corona of five broad, short, truncate, very dark lobes, the inner of five yellowish, oblong-lanceolate, erect, incurved, obtuse ones. September. *l.* minute, tooth-like, distant, horizontal or recurved. Stems procumbent, purplish-brown; branches ascending, divaricate. Zanzibar, 1897. Stove. (B. M. 7000.)

H. Hystrix (quill-like). *fl.* having the limb and throat of the corolla covered with fleshy, subulate processes; parts of the inner corona having their apices expanded into flattened, oval, horizontal processes, somewhat resembling an inverted foot, SYN. *Stapelia Hystrix* (B. M. 5751).

H. macrocarpa (large-fruited). *fl.* greenish-yellow, spotted with red; corolla shortly campanulate. Abyssinia, 1895. Stove. (R. G. 1895, p. 353, t. 1416.)

H. macrocarpa (of Dammann). A synonym of *H. Penzigii.*

H. Penzigii (Penzig's). *fl.* blackish-purple, disposed in sessile cymes; corolla campanulate, 1in. across. Stems 3in. high, five-angled, with teeth nearly ¼in. long. Abyssinia, 1892. Stove. SYN. *H. macrocarpa,* of Dammann (R. G. 1892, p. 526, f. 108).

H. somalica (Somaliland). *fl.* deep brownish-purple with yellow spots on the corona, 1½in. long, campanulate; pedicels ¼in. long. Stems 3in. long, five-angled, with acute teeth. Somaliland, 1893. Allied to *H. oculata.*

H. Sprengeri (Sprenger's). *fl.* golden-bronze, with a white centre; corolla star-shaped. Abyssinia, 1893. Stove.

H. tubata (tubular). *fl.* solitary, pale greenish, with reddish dots, the throat red-pilose; corolla ten-toothed, campanulate. Branches tetragonal. SYN. *Stapelia tubata* (L. B. C. 225).

HUERNIOPSIS (from *Huernia,* and *opsis,* resemblance). ORD. *Asclepiadeæ.* A monotypic genus. The species, *H. decipiens,* is a tiny, greenhouse succulent, with crimson-brown and yellow flowers, allied to *Huernia.* It was introduced from the South African Diamond Fields in 1877, but is of more botanical than horticultural interest.

HULTHEIMIA. Included under **Rosa** (which *see*), the correct name of *H. berberifolia* being *R. simplicifolia.*

HUMBOLDTIA (of Necker). A synonym of **Voyria** (which *see*).

HUMBOLDTIA (of Ruiz and Pavon). A synonym of **Pleurothallis** (which *see*).

HUMMING-BIRD HAWK MOTH. *See* **Macroglossa stellatarum.**

HUMULUS. SYN. *Lupulus.* Flowers dicœcious, the males paniculate, the females spicate. Leaves opposite, petiolate, broad, five- to seven-nerved. To the species described on p. 157, Vol. II., the following should be added:

H. japonicus (Japanese). *fl.*, males in long, lax panicles; females in short, ovoid spikes, on long peduncles, with cordate, cuspidate-acuminate bracts, which do not enlarge in the fruit. *l.* palmately five- to seven-lobed, the margins toothed. Japan. 1886. Somewhat like the common Hop. (R. G. 1886, p. 359, f. 43.)

H. j. lutescens (yellowish). This differs from the type in having leaves of a bronzy or golden tint. 1898.

HUNTSMAN'S CUP. *See* **Sarracenia purpurea.**

HUONIA. A synonym of **Acronychia** (which *see*).

HURA (of Kœnig). A synonym of **Globba** (which *see*).

HURTLE-BERRY. *See* **Vaccinium Vitis-Idæa.**

HUTCHINIA. A synonym of **Boucerosia** (which *see*).

HUTCHINSIA. To the species described on p. 158, Vol. II., the following should be added:

H. alpina (alpine).* *fl.* white, in clusters about 1in. high; style very shortly exserted. May. *fr.*, siliquas acute at both ends. *l.* pinnatipartite, glabrous. Pyrenees, &c., 1775. A beautiful rockery or border perennial for a dry, sunny position.

H. calycina (having a prominent calyx). A synonym of *Smelowskia calycina.*

FIG. 449. HYACINTHUS L'INNOCENCE.

HYACINTHUS. Including *Bellevalia.* To the species and varieties described on pp. 159-60, Vol. II., the following should be added. Several species formerly included hereunder are now referred to **Muscari.**

H. Aucheri (Aucher's). *fl.* purplish-tinted; perianth ¼in. long; raceme dense, twenty- to twenty-five flowered, 1½in. long; scape firm, 3in. to 4in. long. *l.* three, fleshy-coriaceous, linear, 6in. to 8in. long. Persia, 1894. SYN. *Bellevalia Aucheri.*

H. azureus (sky-blue). A synonym of *H. ciliatus.*

H. ciliatus (ciliated).* *fl.*, lower ones deep blue, deflexed, with an oblong perianth ¼in. long, the segments about one-third as long as the tube; upper ones nearly sessile, the sky-blue, campanulate perianth having segments nearly or quite as long as the tube; raceme dense, conical, with a thickened blue axis; scape rather shorter than the leaves. February. *l.* six or eight, lorate, erect, glaucous, 4in. to 6in. long, deeply channelled down the face. Bulb white, about 1in. in diameter. Asia Minor. SYN. *H. azureus* (B. M. 6822). There is a larger form—*giganteus*—from Mount Muris. 1898. (G. C. 1898, xxiv., p. 190, *f.* 52.)

H. fastigiatus (pyramidal).* *fl.*, perianth bright lilac, ¼in. to ⅜in. long, the segments oblong-lanceolate; raceme few-flowered, in the wild state often congested into a corymb; scape erect, terete, shorter than the leaves. March and April. *l.* three to six or more, subulate, weak, glabrous, 6in. long, contemporary with the flowers. Corsica and Sardinia, 1832. (B. M. 6663.)

H. lineatus (lined). *fl.*, perianth blue, campanulate, ¼in. to ⅜in. long, ascending; raceme 1in. long, six- to twelve-flowered; scape 2in. to 4in. high. Spring. *l.* two, rarely three, oblong-lanceolate, acute, falcate, line-nerved, 3in. to 4in. long. Asia Minor, 1887. (R. G. 1887, p. 446, f. 114.)

H. nonscriptus (unwritten). A synonym of *Scilla nutans.*

H. syriacus (Syrian). A synonym of *H. trifoliatus.*

H. trifoliatus (three-leaved). The correct name of *Bellevalia syriaca.* SYN. *H. syriacus.*

Hyacinthus—*continued.*

Varieties. Many of the older varieties, like Alba Maxima, Alba Superbissima, Laurens Koster, Grand Lilas, L'Innocence (Fig. 449), and La Grandeur, in their several colour sections, continue to rank with the best varieties at the present time. Still some very notable additions have been made since this work was originally published, and a selection of these will be found below:

Single Blue. BARON VAN TUYLL, CAPTAIN BOYTON, CZAR PETER, DUKE OF YORK, ELECTRA, GENERAL GORDON, GRAND MAITRE, HAYDN, KING COLE, LORD BALFOUR, MAGNIFICENT, MASTERPIECE, QUEEN OF THE BLUES, SIR E. LANDSEER, THE SHAH, and THE SULTAN.

Single Red. BELLE QUIRINE, CARDINAL WISEMAN, CHALLENGER, COUNTESS OF ROSEBERY, FABIOLA, GENERAL PELISSIER, GIGANTEA, KING OF THE BELGIANS, KING OF THE REDS, KOHINOOR, L'ORNEMENT ROSE, and LORD PERCY.

Single White. AVALANCHE, BRITISH QUEEN, DUKE OF CLARENCE, KING OF THE WHITES, LADY CLINTON, MISS NIGHTINGALE, PRINCESS AMELIA, PRINCESS OF WALES, QUEEN OF THE WHITES, SNOWFLAKE, and WHITE PERFECTION.

Single Yellow. ADELINE RISTORIE, CITY OF HAARLEM, DUC DE MALAKOFF, IDA, KING OF THE YELLOWS, L'OR D'AUSTRALIE, and OBELISK.

Double Blue. CHARLES DICKENS, CROWN PRINCE OF SWEDEN, PERFECTION, PURPLE PRINCE, and VAN SPEYK.

Double Red. BOUQUET ROYAL, CHANCELLOR, EMPRESS OF INDIA, PRINCESS LOUISE, SANS SOUCI, and THE FIRST.

Double White. EDISON, FLORENCE NIGHTINGALE, LA GRANDE DUCHESSE, LORD DERBY, PRINCESS LOUISE, TRIUMPH BLANDINA, and VIRGO.

HYÆNACHNE. A synonym of **Toxicodendron** (which *see*).

HYALOPTERUS PRUNI. *See* **Peach—Insect Pests,** and **Vine—Animal Pests.**

HYBANTHERA. Included under **Tylophora** (which *see*).

HYBERNIA. Two members of this genus—*H. aurantiaria* (Scarce Umber Moth) and *H. defoliaria* (Mottled Umber Moth)—are very destructive to orchard trees, including Apple, Plum, Nut, &c., as well as to Elm, Oak, Birch, Beech, and Hawthorn. The popular name of the first has been ill-bestowed, as the insect is common rather than scarce. The male, female, and caterpillar of the Scarce Umber Moth are shown at Fig. 450.

By Permission of the Board of Agriculture.

FIG. 450. SCARCE UMBER MOTH (*Hybernia aurantiaria*), showing (1) Winged Male, (2) Wingless Female, and (3) Caterpillar. All natural size.

Grease-banding, as suggested in Vol. II., p. 161, may be profitably employed if the grease is renewed frequently through the winter and early spring. For all that, some of the females are sure to pass the bands and lay their eggs. This being so, Paris Green in the proportion of 1oz. to 20 gallons of water should be sprayed on to poison the food-plant. This may be done several times during the season—until, in fact, the fruits are half-grown. The first spraying may be done as soon as the caterpillars are seen. If the use of Paris Green be objected to, then quassia and soft soap solutions may be tried, though the former is preferable.

HYBRIDISING, or **CROSS-FERTILISING.** The most important work in this connection to be chronicled is in the Orchid section, where some beautiful bigeneric hybrids have been raised. *See* **Orchid Fertilisation.**

HYDNOPHYTUM (from *Hydnon*, the old Greek name used by Theophrastus for the Truffle, and *phyton*, a plant; the tuber-like stock resembles a Truffle). ORD. *Rubiaceæ.* A genus embracing thirty species of very curious, stove, epiphytal, highly glabrous shrubs, with a deformed, fleshy, tuberous, simple or lobed stock, excavated by ants; they are natives of the Indian Archipelago, tropical Australia, and the Fiji Islands. Flowers white, sessile, small, axillary, solitary or fascicled; corolla funnel- or salver-shaped, with a short or long tube. Drupe small, with two stones. Leaves opposite, leathery, obtuse. Two of the species have been introduced. For culture, *see* the closely-allied genus **Myrmecodia.**

H. Forbesii (Forbes's). *fl.* tubular, axillary, very shortly pedicellate. July. *fr.* coral red, ellipsoid, crowned with the calyx limb, produced in October. *l.* sub-sessile, obovate, obtuse or slightly acute. Stems short, terete. Tuber prickly. New Guinea, 1886. (B. M. 7218.)

H. longiflorum (long-flowered). *fl.* tubular, ½in. long, in axillary clusters. August. *l.* opposite, 2in. to 2½in. long, ovate, fleshy, green. Stems proper terete; the base swollen and tuber-like. Fiji, 1891. (B. M. 7343.)

HYDRANGEA. With the exception of dry, hungry soil, Hydrangeas grow freely in ordinary garden soil, but delight in one in which leaf-mould and peat form a good part. Perfect drainage should be secured, as they, especially *H. Hortensia* and its lovely varieties, delight in copious supplies of water during the growing season. The last-named group usually die down to the ground line in winter, but with the return of spring vigorous shoots are thrown up from the old stools. Much benefit is derived from a mulching or top-dressing of manure or leaf-mould in June, and the variety named *H. paniculata grandiflora* requires severe pruning in order to produce large, massive panicles of flowers. The principal growths made the previous year should be cut back to within a couple or three eyes of the old wood in February or March, and the slender unripened shoots removed altogether. The last-named variety is well adapted for conservatory decoration in early spring, but it is not advisable to subject it to very hard forcing.

To the species and varieties described on pp. 162-3, Vol. II., the following should be added:

H. altissima (very tall). *fl.*, buds conical, acute, but the calyptrate corolla becoming hemispheric before falling, owing to the rapid swelling of the ten stamens. *l.* 3in. to 6in. long, ovate-lanceolate, cordate, or narrow-lanceolate, serrated or entire except near the apex. *h.* 8ft. to 15ft. Temperate Himalayas. A spreading, hardy shrub.

H. aspera (rough).* *fl.*, barren ones white, large and numerous, disposed in a hairy corymb; sepals serrated or entire. *l.* long-lanceolate, acuminate, 6in. to 8in. long, 2in. to 3in. broad, sometimes elongated to the petioles, the upper surface slightly, the lower densely, hairy. *h.* sometimes 20ft. Temperate Himalayas, 1889. Hardy. This somewhat resembles *H. paniculata* in habit.

H. Belzonii (Belzoni's). A form of *H. Hortensia.*

H. chinensis (Chinese). *fl.* having the enlarged sepals almost fleshy, and nearly equal, remaining till the fertile flowers have matured; cymes much larger. *l.* 3in. to 5in. long. Habit stouter. Otherwise closely resembling *H. virens.* North China. Hardy.

H. cordata (heart-shaped). A synonym of *H. arborescens.*

H. hirta (hairy). *fl.* white, disposed in numerous terminal (not radiating) umbels; stigma bilobed; peduncles and petioles hairy. *l.* ovate, serrated, villous, Nettle-like, becoming nearly glabrous with age. Branches slender, at first hairy. *h.* 3ft. to 4ft. Mountains of Japan. Hardy.

H. Hortensia (Hortensia). The correct name of *H. hortensis.*

H. H. acuminata (taper-pointed). *fl.* blue. SYN. *H. japonica cærulescens.* Of this there are forms with white and pink flowers.

H. H. Belzonii (Belzoni's). *fl.*, inner sterile ones deep blue; sterile ones white or tinged with blue, and having entire sepals. There is a variegated leaved form of this.

H. H. Lindleyana (Lindley's). *fl.*, outer ones of the umbel white or bluish, irregularly spotted with red on the borders; central flowers small. A stout variety. SYN. *H. H. roseo-alba* (Gn. 1894, ii., p. 467, t. 990).

H. H. ramulus-coccinea (having scarlet branchlets).* *fl.* tinted with rose, large; peduncles translucent red. Young shoots and petioles of a dark plum-red. 1890.

Hydrangea—*continued.*

H. H. rosea (rosy).* *fl.* of a brilliant, deep rose-pink, large, in medium-sized, globular heads. 1883. A fine decorative plant.

The variety *stellata rubra plena* has double flowers. 1890.

H. involucrata (involucred). *fl.* lilac or yellowish, of two forms; cymes clustered, before opening having a caducous, two- or three-leaved involucre. *l.* ovate, acuminate, glandular-serrated, reticulate-veined, hispid on both sides. Mountains of Japan. Greenhouse.

H. japonica (Japanese). A form of *H. Hortensia.*

H. nivea (snowy). A synonym of *H. radiata.*

H. petiolaris is a form of *H. quercifolia.*

H. radiata (rayed). *fl.* white, becoming wholly sterile under cultivation; buds depressed. May and June. *l.* ovate, mostly cordate, acuminate, sharply serrated, silvery-tomentose beneath (this feature is often absent from cultivated plants). *h.* 6ft. to 8ft. South Carolina, 1786. Hardy. SYN. *H. nivea* (W. D. B. i. 43).

HYDROCERA ANGUSTIFOLIA. The correct name of **Tytonia natans** (which *see*). SYN. *H. triflora.*

HYDROCLEYS COMMERSONII. The correct name of **Vespuccia Humboldtii** (which *see*). *Limnocharis Humboldtii* is the same plant.

HYDROCOTYLE (from *hydor*, water, and *kotyle*, a flat cup; in allusion to the habitat and to the cup-shaped leaves of some of the species). ORD. *Umbelliferæ.* A large genus (about seventy species) of stove, greenhouse, or hardy herbs or under-shrubs, with long, slender, creeping, often tufted stems, broadly distributed, especially in moist, temperate regions. Flowers minute. Leaves entire or palmately dissected. One or two of the species have been introduced, but they are more of botanical than of horticultural interest. *H. vulgaris* is the common Pennywort or Pennyleaf.

HYDROGLOSSUM. Included under **Lygodium** (which *see*).

HYDROMYSTRIA. A synonym of **Limnobium** (which *see*).

HYDROPELTIS. The correct name of *H. purpurea* is *Brasenia Schreberi.*

HYDROPYRUM. A synonym of **Zizania** (which *see*).

HYDROSME. Included under **Amorphophallus** (which *see*).

HYDROTÆNIA (from *hydor*, water, and *tainia*, a band; the segments have a triangular bar at their base, which secretes a honey-like fluid). ORD. *Irideæ.* A small genus (four species) of greenhouse or half-hardy, bulbous plants, natives of Mexico and Peru, and formerly included under *Tigridia*, from which they mainly differ in having a campanulate perianth, the segments being without any spreading blade. *H. Meleagris* and *H. Van Houttei*, the species in cultivation, will be found described under **Tigridia.**

HYGROPHILA (from *hygros*, moist, and *phileo*, to love; some of the species are found in wet places). **Asterocantha** (which *see*) is included hereunder by Bentham and Hooker. ORD. *Acanthaceæ.* A genus embracing about fourteen species of stove herbs, broadly dispersed over tropical and sub-tropical regions. Flowers bluish-purple, sessile, in terminal heads or axillary whorls; stamens didynamous. Leaves opposite, lanceolate or obovate, entire.

H. spinosa (spiny). The correct name of the plant described on p. 140, Vol. I., as *Asteracantha longifolia.*

HYLEMIA NIGRESCENS. *See* **Carnation Maggot.**

HYLESINUS ATER. *See* **Pine Bark Beetles.**

HYLINE (from *hyle*, a wood; the genus was founded on a plant found in the woods of Brazil). ORD. *Amaryllideæ.* A small genus (two species) of stove plants with the habit of **Hymenocallis** (which *see* for culture), but differing in their numerous ovules and in the free perianth segments. Both are natives of Brazil. One of them has been introduced.

H. Worsleyi (A. Worsley's). *fl.* 8in. long, two to a scape; perianth segments white, narrow; scape 1½ft. high. *l.* 1½ft. long, 2in. broad. 1899.

HYLOBIUS ABIETIS. *See* **Pine Weevils.**

HYLOGYNE. A synonym of **Telopea** (which *see*).

HYLONOME. A synonym of **Behnia** (which *see*).

HYLOTOMA. *See* **Rose Sawflies.**

HYLURGUS PINIPERDA. This is the name by which the destructive Beetle, formerly classed as *Hylesinus piniperda*, is now known. *See* **Pine Bark Beetles.**

HYMENETRON. A synonym of **Strumaria** (which *see*).

HYMENIUM. Spore-bearing surface in certain fungi.

HYMENOCALLIS. According to J. G. Baker, this genus comprises thirty-one species, natives of tropical and sub-tropical America. Flowers usually pure white; stamens united in a distinct cup (corona), the free portion of the filaments filiform; peduncle solid, compressed. Leaves sessile and lorate or petiolate and oblong. To the species described on pp. 164-5, Vol. II., the following should be added (all have white flowers):

H. caribæa (Caribbean). *fl.* six to twelve in a sessile umbel; perianth tube 2in. to 3in. long; segments linear, 3in. to 3½in. long; corona regularly obconic, 1in. long, faintly two-toothed between the free tips of the filaments, which are 1½in. to 2in. long; peduncle acutely angled, little shorter than the leaves. June. *l.* a dozen or more, multifarious, lorate, acute, 2ft. to 3ft. long, 2in. to 3in. broad above the middle, narrowed to 1in. at the base. Bulb globose, 3in. to 4in. in diameter. West Indies, 1872. Stove. SYNS. *Pancratium caribæum* (B. M. 826), *P. declinatum* (L. B. C. 558).

FIG. 451. HYMENOCALLIS OVATA.

H. concinna (neat). A species resembling *H. caribæa*, but evergreen, and smaller in all its parts. *l.* 1in. wide. Mexico, 1893. Said to be quite hardy in Naples.

H. cordifolia (cordate-leaved). *fl.* about twenty in an umbel; perianth tube 4in. or more in length, the segments 2in. long; corona inconspicuous. *l.* broad, Eucharis-like, 2½ft. long. Venezuela, 1899. Stove. (R. H. 1899, p. 445, f. 191.)

H. crassifolia (thick-leaved). *fl.* four in a sessile umbel; tube green, 2½in. long, the segments linear, 3½in. long; scape 2ft. high. *l.* six to eight, lorate, obtuse, bright green, 2ft. long, 2in. broad. Southern United States, 1871. Greenhouse. SYN. *Pancratium crassifolium* (Ref. B. 331).

H. deflexa (deflexed). *fl.* three or four in a sessile umbel; perianth tube curved, 1½in. to 2in. long, the segments linear, 3in. to 4in. long; corona funnel-shaped, 2in. to 3in. long, with recurved processes 1in. or more in length; peduncle ancipitous. *l.* ensiform, acute, 1ft. long, less than 2in. broad. Andes of Peru, 1839. Stove (probably a natural hybrid). SYN. *Ismene deflexa.*

H. Deleuilii (Deleuil's). A synonym of *H. littoralis.*

Hymenocallis—*continued.*

FIG. 452. INFLORESCENCE AND LEAVES OF HYMENOCALLIS TUBIFLORA.

H. eucharidifolia (Eucharis-like).* *fl.*, perianth with a green, slender tube 4in. long; segments linear, deeply channelled down the face, 3in. to 3½in. long; corona funnel-shaped, 1¼in. long; umbel four- or five-flowered; scape ancipitous, 1ft. long. May. *l.* four, thin, bright green, oblong, 1ft. long, nearly sessile. Tropical America, 1884. Stove.

H. glauca (bluish-grey). The correct name of *H. Choretis.*

H. Horsmanni (Horsmann's). *fl.* one to three in a sessile umbel; perianth tube 4in. to 5½in. long, the segments very narrow, 2½in. long; corona rotate, less than 1in. long; peduncle 3in. to 4in. long. July. *l.* few, thin, oblanceolate, 1ft. long, 1in. to 1½in. broad, very narrow at base. Mexico, 1883. Stove.

H. humilis (dwarf). *fl.* solitary; perianth tube 1¼in. long, dilated at the top, the segments linear, 2in. long; corona broadly funnel-shaped, ⅜in. long; peduncle rather shorter than the leaves. *l.* linear, 4in. to 6in. long, ¼in. broad. Florida, 1888. Greenhouse. (G. & F. 1888, i., p. 114, f. 23.)

H. lacera (torn). The correct name of *H. rotata.*

H. littoralis (shore-loving). The correct name of *H. adnata.* SYN. *H. Deleuilii.*

H. Moritziana (Moritz's).* *fl.* fragrant, twenty or more in an umbel; perianth tube very long, greenish. *l.* erect, distichous or nearly so, Eucharis-like, 2½ft. long. La Guayra. Stove. A compact, handsome, evergreen species, allied to *H. eucharidifolia*, but larger in all its parts.

H. ovata (egg-shaped) is the correct name of *H. amœna.** SYNS. *Pancratium amœnum* (B. M. 1467), *P. fragrans*, *P. ovatum* (B. R. 43). See Fig. 451.

H. Palmeri (Palmer's). *fl.* solitary; perianth tube 3½in. to 4in. long, the segments as long as the tube and only one line broad; corona funnel-shaped, 1in. to 1¼in. long, acuminately lobed; peduncle slender, less than 1ft. long. *l.* linear, 1ft. long, ¼in. broad. Florida, 1888. Greenhouse. (G. & F. 1888, i., p. 138, f. 25.)

H. quitoensis (Quito). The correct name of *H. tenuifolia.*

H. schizostephana (having a cut corona). *fl.* resembling those of *H. caribæa*, but having the filaments very stout and winged at the base, forming an irregular cup, appearing as if torn. Brazil, 1899.

Hymenocallis—*continued.*

H. tubiflora (tube-flowered). *fl.* many in an umbel, sessile; perianth tube erect, slender, 6in. to 8in. long, the segments linear, about 4in. long; corona narrow funnel-shaped, 1in. long; peduncle compressed, 1ft. long. *l.* with a thin, oblong, acute blade, 8in. to 12in. long, gradually narrowed to a petiole 6in. to 12in. long. Guiana, Trinidad, &c., 1803. See Fig. 452. SYN. *Pancratium guianense.*

H. undulata (wavy). The correct name of *H. Borskiana.*

H. virescens is identical with *H. Macleana.*

HYMENOCHARIS (of Salisbury). A synonym of **Ischnosiphon** (which *see*).

HYMENOCYSTIS. Included under **Woodsia** (which *see*).

HYMENOLÆNA. A synonym of **Pleurospermum** (which *see*).

HYMENOMYCETES. *See* **Oak Fungi.**

HYMENOPAPPUS (from *hymen*, a membrane, and *pappos*, pappus; the latter consists of hyaline paleæ). SYN. *Rothia.* ORD. *Compositæ.* A genus embracing seven species of hardy or half-hardy, annual, biennial, or perennial, mostly floccose-tomentose herbs, natives of North America, and closely allied to *Chænactis.* Flower-heads white or yellow, medium-sized, corymbosely cymose or solitary, pedunculate. Leaves alternate, once or twice pinnatifid or partite; lower ones sometimes entire. Two of the species have been introduced. They thrive under ordinary treatment.

H. artemisiæfolius (Artemisia-leaved). *fl.-heads* white, ¼in. long, corymbiform-cymose and rather numerous, on short peduncles. Spring. *l.* varying from simply pinnatifid or lyrately few-lobed and sometimes quite entire (lanceolate or oblong) to bipinnately parted into broadly linear or narrowly oblong obtuse divisions or lobes. *h.* 1ft. to 3ft. Texas. Perennial.

H. tenuifolius (slender-leaved). *fl.-heads* dull white, ¼in. to ½in. long, rather numerous and corymbosely cymose, on rather short, slender peduncles. Spring. *l.* rather rigid, once or twice (radical ones thrice) pinnately parted into very narrow-linear or filiform divisions, their margins soon revolute. *h.* 1ft. to 2ft. Nebraska, &c. Biennial.

FIG. 453. HYMENOPHYLLUM PULCHERRIMUM.

HYMENOPHYLLUM. SYN. *Sphærocionium.* Including *Leptocionium* and *Pachyloma.* With the exception of the beautiful *H. fuciforme* and *H. pulcherrimum* (Fig. 453), nearly all the species at present known are of creeping habit. Being provided with shallow-rooting rhizomes, they succeed best when growing on the surface of a rock, and are allowed to run under the moss which covers it. It is worthy of note that the great majority of these plants are natives of New Zealand, Tasmania, and Chili, where they exist in a climate naturally cool and humid, and of the East and West Indies, where they occur under trees at high elevations; in such situations they

FIG. 454. FROND OF HYMENOPHYLLUM ÆRUGINOSUM.

are permanently subjected to the influences of shade and moisture, and also to a comparatively cool temperature. The fronds show considerable variation, as may be seen from Figs. 454, 455, 456, and 457.

Hymenophyllums are particularly well adapted for growing in Fern-cases in towns; they are all the more valuable by reason of their fronds, though apparently of a delicate nature, not being, like that of most other Ferns, affected by fogs, which prove so destructive to vegetable life in general. They require constant moisture, but this should be produced more by means of

FIG. 455. FROND AND PORTION OF RHIZOME OF HYMENOPHYLLUM DEMISSUM.

Hymenophyllum—*continued.*

condensation than by mechanical waterings, to which these plants are decidedly averse, especially the species with hairy or woolly fronds, which greatly suffer from being syringed overhead. It is especially to be deprecated in the case of *H. hirtellum, H. scabrum, H. valvatum, H. tunbridgense,* and *H. sericeum.* For the last-named

FIG. 456. FROND AND RHIZOME OF HYMENOPHYLLUM JAVANICUM.

the material most suited to its growth is a piece of sandstone, or any other porous stone, over which its tiny rhizomes can run freely without, however, clinging to it. On this subject, Mr. Marchant, a very careful observer, says: "I have been trying a method which is proving most satisfactory. I have had a large pit excavated under a spreading tree. I then made a bed of cement to just cover the bottom, and hold say 1in. of water over the whole surface; all the Ferns are placed on

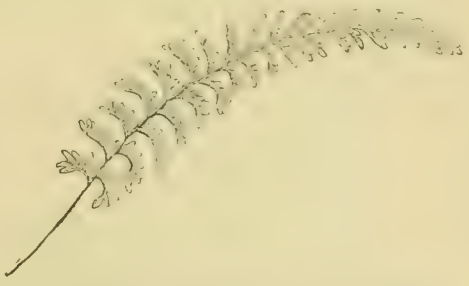

FIG. 457. FROND OF HYMENOPHYLLUM PECTINATUM.

bricks or on inverted pots, and the whole is covered with three-frame lights. I get a splendid condensation and much time is saved, as no overhead syringing is required."

Hymenophyllums require but little light, and only a small depth of soil, as their slender rhizomes, mostly of a wiry nature, have the greatest objection to being buried under the loose material in which they delight to grow. When the plants are cultivated in pots or in pans the compost

Hymenophyllum—*continued.*

should be made of sandy peat, chopped sphagnum, and small pieces of sandstone, in about equal parts, with an additional sprinkling of coarse crock dust, the whole being made so light and permeable as to be prevented under any circumstances from becoming sour through the accumulated moisture resulting from the repeated sprinklings and waterings necessary to produce condensation. Some species, especially among the most dwarf-growing kinds, succeed best when established on a piece of sandstone without any other material.

Hymenophyllums are propagated but slowly—a fact which no doubt accounts for their prices remaining higher than those of ordinary Ferns. We have known only one batch of young seedlings, and these, even when five years old, did not show their true characters. The plants are, however, commonly increased by the division of their rhizomes, an operation which is safe enough, although it is one requiring a little patience. Draughts must be carefully avoided at all times of the year, and air should only be very sparingly admitted into the case.

No Hymenophyllum is more effective than *H. demissum*; it is a suitable companion for the Killarney Fern, with which, under cultivation, it is often found. The lively green colour of its young fronds, which, with age, turn to the deepest dark green, and the vigorous habit and constitution of the plant, are special recommendations.

H. dichotomum delights in sending its tiny rhizomes through a coating of moss covering either a piece of rock or a block of wood or Tree-Fern.

H. Forsterianum is a very free-growing plant, whose wiry rhizomes are particularly fond of moss and decaying vegetable matter. It produces fronds in great abundance.

H. hirsutum succeeds best on a block of wood and in an upright position; it requires a very humid but airy situation, and great care must be taken at all times that no water touches its fronds.

H. polyanthos does not require such a close temperature as do most Hymenophyllums; the airiest place in the house suits it best. It is provided with exceedingly slender, wiry rhizomes, which delight in making their way through partly-decayed vegetable matter; on that account it makes a beautiful object on a block of wood, its slender, elegantly-arching fronds then showing themselves to great advantage.

H. tunbridgense is one of the most difficult of all Hymenophyllums to manage. It dislikes water over the fronds, and thrives well either in a mixture of equal parts of peat and silver-sand or on a block of sandstone, the principal object being to have it pressed hard on to the material upon which it is intended to grow. A successful cultivator of these plants says that the treatment which gives the most satisfactory results consists in laying the sheet of *Hymenophyllum* upon a porous piece of stone without any soil, and laying a slab over it, leaving it in that state for three to four weeks, after which time the plant has usually taken hold of the new stone, when the slab is removed.

H. valvatum is noteworthy from the fact that its growth takes place in autumn and winter, when most other Ferns from the same habitats are comparatively resting. Although not of a hirsute nature, it greatly dislikes water on its delicate and exceedingly transparent fronds.

To the species described on pp. 163-4, Vol. II., the following should be added:

H. attenuatum (narrowed). A synonym of *H. magellanicum.*

H. axillare (axillary). *rhiz.* very slender. *fronds* 3in. to 8in. long, 1in. broad, narrow-oblong, flaccid and pendent, tripinnatifid; main rachis winged throughout or above only; lower pinnæ varying from ½in. long with simple segments to 1½in. long with pinnatifid pinnules and several segments. *sori* two to twelve to a pinna, terminal on the lateral segments. West Indies and Venezuela.

H. badium (reddish-brown). *sti.* 2in. to 3in. long, winged above. *fronds* erect, 4in. to 12in. long, 2in. to 3in. broad, oblong or broadly lanceolate, tripinnatifid; main rachis broadly winged; lower pinnæ cut to the rachis into several pinnules on each side, the lowest of which are deeply incised. *sori* two to twelve to a pinna, terminal on the segments on both sides. India, &c. Distinct, but rare in cultivation.

H. Catherinæ (St. Catherine's). *sti.* 1in. to 2in. long, erect, wiry. *fronds* 2in. to 3in. long, 1in. to 1½in. broad, oblong, fully bipinnate; lower pinnæ broadly rhomboidal, cleft to the rachis; lower pinnules several times forked, with very narrow-linear segments. *sori* six or more to each pinna, much broader than the segments. St. Catherine's Peak, Jamaica (at 5000ft.).

H. chiloense (Chiloe).* *fronds* triangular or broadly lanceolate, about 2in. long and 1in. broad, dull green, with conspicuous dark veins, bipinnatifid; pinnæ ciliated on the margins and slightly hairy beneath. *sori* solitary at the base of the pinnæ on the upper side. Chiloe, &c. A gem amongst Filmy Ferns.

H. crispum (curled). This species is closely allied to *H. axillare*, but is distinguished by its crisped fronds, borne on very slender, wingless stipes. Mexico to Peru.

H. cruentum (blood-coloured). *rhiz.* slender, creeping, simple, slightly sinuate. *sti.* slender, naked, 3in. to 6in. long. *fronds* delicately transparent, seaweed-like, 3in. to 5in. long, 1in. to 1½in. broad, with simple, prominent veins, becoming brownish-rosy with age. *sori* six to twelve on each side of the frond, at the tips of the sinuses. Chili.

H. dichotomum (dichotomous).* *sti.* 2in. to 3in. long, winged on both sides. *fronds* broadly triangular, bi- or tripinnatifid, 4in. to 6in. long, 2in. to 3in. broad; lower pinnæ three times as long as broad, the segments crisped and sharply toothed or torn. *sori* numerous in the axils of the segments. Juan Fernandez and Chili. A pretty, dwarf species.

H. dilatatum (dilated) is the correct name of *H. dilatum.*

H. d. Forsterianum (J. Cooper Forster's). *fronds* 1½ft. long, 6in. broad, tripinnatifid; pinnæ 3in. long, not caudate, prettily undulated. *sori* two to six to a pinna, terminal at the tips of the segments on the upper side only; involucre very large, divided nearly to the base. Brazil.

H. elegans (elegant). A synonym of *H. lineare.*

H. elegantulum (rather elegant). *sti.* 1in. to 4in. long, ciliated. *fronds* flaccid, pendulous, 6in. to 18in. long, 2in. to 6in. broad, linear-oblong and pinnate or broadly oblong and bipinnate; rachis free; lower pinnæ in the bipinnate form often with several pairs of pinnules; pinnules 1in. to 3in. long, deeply pinnatifid principally on the upper side; ultimate segments densely hairy. *sori* six to twelve, terminal on the lateral segments. Andes of Ecuador, &c.

H. flexuosum (bending).* *sti.* distinctly winged. *fronds* 10in. to 12in. long, broadly lanceolate, quadripinnatifid; ultimate segments narrow and undulated. *sori* six to twenty to a pinna, terminal on the segments on both sides. New Zealand. This beautifully crisped and undulated Fern is now regarded as a species, and not as a form of *H. javanicum.*

H. Forsterianum (J. Cooper Forster's). A form of *H. dilatatum.*

H. fuciforme (Fucus-like).* *rhiz.* thick, decumbent, resembling crowns. *sti.* strong, erect, narrowly winged above. *fronds* erect, glaucous, 1ft. to 2ft. long, 4in. to 6in. broad, triangular-lanceolate, tripinnatifid; main rachis winged throughout; lower segments sometimes forked. *sori* numerous, small, disposed in the axils of the segments. Chili and Juan Fernandez.

H. fucoides (Fucus-like). *sti.* 2in. to 4in. long, wiry, ciliated. *fronds* oblong, tripinnatifid, 4in. to 6in. long, 1½in. to 2in. broad; main rachis winged above and ciliated; secondary rachis winged throughout; pinnæ rhomboid, acuminate, with long, narrow, spinulose-toothed, entire or forked segments. *sori* not more than four to a pinna, usually confined to the segments on the upper side. Tropical America.

H. lineare (linear).* *rhiz.* slender, hairy, thread-like. *fronds* pendulous, flaccid, 3in. to 8in. long, 1in. to 2in. broad, pinnate; pinnæ deeply cut into simple or forked, linear lobes, with the margins and surface densely hairy. *sori* two to six to a pinna, terminal on the lateral segments. Tropical America. A pretty and distinct species. SYN. *H. elegans.*

H. magellanicum (Magellan). *sti.* erect, wiry, 2in. to 4in. long, naked or winged. *fronds* oblong-triangular, 3in. to 6in. long, 2in. to 4in. broad, tripinnatifid; lower pinnæ broadly triangular, with deeply-cleft pinnules, furnished on each side with several toothed segments. *sori* very small, six to ten to a pinna, terminal on the segments of the upper ones. Chili, Chiloe, &c. (H. S. F. i., t. 36B.) SYN. *H. attenuatum.*

H. multifidum (much-cleft).* *sti.* wiry, naked, 2in. to 4in. long. *fronds* broadly lanceolate, 2in. to 6in. long, 1in. to 5in. broad, tripinnatifid; main rachis winged above, wingless below; ultimate segments narrow. *sori* two to twelve to a pinna, terminal on the lateral segments of the upper ones on both sides. New Zealand. A very elegant species.

H. pectinatum (comb-like).* *sti.* naked, 2in. to 4in. long, very wiry. *fronds* oblong, pinnate, glaucous-green, 3in. to 6in. long, ½in. to 1½in. broad, with conspicuous venation; main rachis only winged towards the summit; pinnæ deeply cleft on their upper side into long, narrow, parallel, simple or slightly forked segments. *sori* six to eight to a pinna, terminal on the lower segments of the upper side. Chili and Chiloe. One of the most beautiful species of the genus. There is a fine variety *superbum.*

Hymenophyllum—*continued.*

H. subtilissimum (very slender). *sti.* 1in. to 3in. long, wiry, erect, tomentose. *fronds* 3in. to 8in. long, 1¼in. to 2in. broad, ovate-lanceolate, tripinnatifid; main rachis slightly winged above; lower pinnæ spreading, divided nearly to the rachis into numerous alternate pinnules, which are again deeply divided into broad, linear segments, the surface and margins tawny-pubescent. *sori* two to twelve to a pinna, terminal on the lateral segments. New Zealand, &c.

H. tamariscifolium (Tamarisk-leaved). A form of *H. javanicum*

H. villosum (villous). A synonym of *H. polyanthos.*

HYMENOSPORUM (from *hymen*, a membrane, and *sporos*, seed; the seeds are girded by membranous wings). ORD. *Pittosporeæ.* A monotypic genus. The species is a greenhouse, evergreen tree, with the habit of **Pittosporum** (which *see* for culture).

H. flavum (yellow). *fl.* yellow, marked orange-red at the mouth of the tube, showy, in a loose, terminal panicle; sepals distinct; petals connivent in a tube above the middle or sub-coherent, and, as well as the numerous stamens and the ovary, silky-tomentose. April. *l.* entire, glabrous, broadly obovate-lanceolate, the uppermost ones often somewhat whorled. Eastern Australia. SYN. *Pittosporum flavum* (B. M. 4799).

HYMENOXYS (of Torrey and Gray). A synonym of **Actinolepis** (which *see*).

HYOPHORBE. SYN. *Sublimia.* According to the Kew authorities, *H. indica* is a good species, and not synonymous with *Chrysalidocarpus lutescens.*

H. indica (Indian). *fl.* white or yellowish; spadix loosely branched; peduncle 3in. to 6in. long. *l.* on petioles 1ft. to 2½ft. long; pinnæ forty to sixty pairs, lanceolate, acuminate, 2ft. long, 2½in. broad; sheath cylindrical. Stem 4in. to 6in. in diameter. *h.* 40ft. to 50ft. Mauritius and Bourbon Island.

HYOSPATHE. *H. elata* is synonymous with **Pigafetta elata,** and *H. pubigera* with **Prestoëa pubigera.**

HYPÆLYPTUM (in part). Synonymous with **Hypolytrum** (which *see*).

HYPELYTRUM. A synonym of **Hypolytrum** (which *see*).

HYPENA PROBOSCIDALIS and **HYPENA ROSTRALIS.** *See* **Snout Moths.**

HYPERICUM. To the species described on pp. 168-9, Vol. II., the following should be added; all of them are hardy.

H. ægypticum is the correct spelling of *H. ægyptiacum.*

H. aureum (golden).* *fl.* large, nearly solitary and sessile; petals orange-yellow, coriaceous, reflexed, longer than the ovate, unequal sepals and the excessively numerous stamens. Summer. *l.* oblong, obtuse, attenuate, glaucous beneath, minutely undulate-crisped on the margin, somewhat coriaceous. *h.* 2ft. to 4ft. Southern United States. Habit dense and compact.

H. Buckleyi (Buckley's). *fl.* bright yellow, about 1in. across, solitary, terminal. North Carolina, 1891. A dwarf, shrubby species. (G. & F. iv., p. 581, f. 91.)

H. chinense (Chinese). *fl.*, calyx oblong, dotted with black; peduncles bibracteate. September, March. *l.* elliptic, obtuse, slightly dotted with black. Stems terete. *h.* 3ft. China, 1753 and 1833. SYNS. *H. monogynum* (B. M. 334), *H. sinense.*

H. densiflorum (dense-flowered). *fl.* smaller than in *H. prolificum*; calyx very short, ovate. *l.* linear-lanceolate, attenuated at base. Branches sub-terete. United States, 1890. Allied to *H. prolificum.* (G. & F. iii., p. 524, f. 67.)

H. humifusum (spreading). *fl.* in terminal cymes; calyx exceeding the corolla; stamens fifteen to twenty. *l.* oblong, obtuse, very slender, with pellucid and black dots. Stems spreading over the surface of the ground. Europe. A useful plant for the rockery.

H. monogynum (one-styled). A synonym of *H. chinense.*

H. Moserianum (Moser's).* *fl.* of a rich butter-yellow, as large as a crown piece, with crimson-toned stamens; petals of good substance. 1891. A hybrid between *H. patulum* and *H. calycinum*, but most closely resembling *H. Hookerianum.*

H. M. tricolor (three-coloured). *l.* variegated with white and rosy-carmine. 1894.

H. sinense (Chinese). A synonym of *H. chinense.*

H. triflorum is a form of *H. Hookerianum*, its correct name being *H. H. Leschenaultii.*

H. uralum is a synonym of *H. patulum.*

HYPEROGYNE. A synonym of **Paradisia** (which *see*).

HYPHA. A filament of mycelium.

HYPHÆNE. SYNS. *Cucifera, Douma.* To the species described on p. 169, Vol. II., the following should be added:

H. crinita (hairy). *fr.* obovate, depressed, shortly stalked. *l.* flabellate, with fibres between the segments, covered on both sides with very fugacious, white down; margins and upper sides of the nerves scabrous; petioles sheathing at base, deeply channelled above. Stem simple, 8ft. to 20ft. high. Natal. Greenhouse. SYNS. *H. natalensis, H. Petersiana.*

H. natalensis (Natal). A synonym of *H. crinita.*

H. Petersiana (Peters'). A synonym of *H. crinita.*

In addition to the two species described in this work, *H. Schatan*, a native of Madagascar, is grown at Kew.

HYPOCHÆRIS (from *hypo*, for, and *choiros*, a pig; the roots of the plants are said to be greedily eaten by pigs). Including *Agenora* and *Seriola.* ORD. *Compositæ.* A genus embracing about thirty species of mostly hardy, perennial or annual, scapigerous herbs, broadly dispersed over temperate or mountainous regions, allied to *Taraxacum.* Flower-heads yellow, long-pedunculate, homogamous; florets all ligulate; involucral bracts in many series; receptacle flat. Leaves rosulate, entire, toothed or pinnatifid. Several of the species have been introduced, but they are of little horticultural value.

HYPOCHIL. A term applied to the lower portion of the divided lip in some Orchids.

HYPOCYRTA. To the species described on p. 169, Vol. II., the following should be added:

H. gracilis (slender). A synonym of *Codonanthe gracilis.*

H. leucostoma (white-mouthed). A synonym of *Besleria leucostoma.*

H. pulchra (pretty).* *fl.* axillary, solitary, hairy; sepals scarlet, ¼in. long, erect; corolla pale yellow, nearly 1in. long, urceolate. June. *l.* 4in. to 5in. long, ovate, sub-acute, cordate at base, rather fleshy, serrulated, dull green clouded with brown above, vinous-red beneath; nerves sunk above, very prominent beneath. Stem erect, 5in. high. Colombia, 1894. (B. M. 7468.)

HYPODERRIS. The Hypoderrises are of easy culture, thriving well in a warm temperature and moist atmosphere. The compost which they prefer consists of one part of fibrous loam, two of peat or partly-decayed leaf-mould, and one of silver-sand; and although attaining larger dimensions when grown in a shady place, they thrive luxuriantly in, and are not averse to, strong light. They also enjoy an abundance of water at the roots, especially from May to October. On account of their robust habit,

FIG. 453. FROND OF HYPODERRIS BROWNII.

Hypoderris—*continued.*

these Ferns are well adapted for the decoration of the warm rockery, where their foliage, of a massive nature, forms a striking contrast to that of plants with more finely-divided fronds. *H. Brownii* (Fig. 458) is an uncommon and distinct species.

HYPOGENOUS. Growing upon the under-surface of anything. (Not to be confounded with Hypogynous.)

HYPOLEPIS. All the species of *Hypolepis* require either stove or greenhouse temperature. They are highly ornamental when planted in the rockery, for which purpose they are most useful, as they thrive best when associated with stones, over and amongst which their creeping rhizomes delight to run, although they do not cling to the stones. All are of easy culture, and when kept in pots should be grown in rough peat with a good sprinkling of small stones and silver-sand, as they require an abundant supply of water at the roots at all times of the year. On that account also it is indispensable that the drainage of either the pots or the part of the rockery in which they are planted should be perfect, any deficiency in this respect producing most disastrous results. Hypolepises should be grown in a fairly shaded position, as the rays of the sun are hurtful to their foliage, which in most instances is of a soft, papery texture. All the species may be propagated from spores, which in most cases vegetate freely; but they are usually increased by the division of their rhizomes, this being a quicker and less troublesome mode of reproduction. *H. repens* produces spores so freely that when once obtained it becomes a troublesome weed, covering every Fern-pan, to the exclusion of less robust kinds.

H. Bergiana is singularly prolific, and the way in which it reproduces itself most readily is very peculiar, and confined to this species: from its tiny fibrous roots spring a quantity of small, seedling-like plants, which form good-sized subjects much more quickly than seedlings proper.

To the species described on p. 170, Vol. II., the following should be added:

H. amaurorachis (having a dark rachis).* *rhiz.* thick, hairy. *sti.* 1ft. to 1½ft. long, and, as well as the rachis, dark purplish. *fronds* handsome, very hairy, elongated-triangular, 3ft. long, 2ft. broad at base; pinnæ distinctly stalked, those at the base opposite, the others alternate; pinnules undulated and notched. *sori* abundant and conspicuous, solitary in the notches of the lobes. Australia. Greenhouse.

FIG. 459. PINNA AND PINNULE OF HYPOLEPIS ANTHRISCIFOLIA.

H. anthriscifolia (Anthriscus-leaved), of Presl. *rhiz.* stout, wide-creeping. *sti.* strong, erect, straw-coloured, 1ft. to 2ft. long, rough. *fronds* thin, 6ft. to 10ft. long; lower pinnæ 1ft. or more in length, 4in. to 6in. broad; pinnules spear-shaped, distant; segments cut down to the midrib into small, oblong, deeply-pinnatifid divisions. *sori* two to four together in the lower sinuses. Bourbon, Mauritius, &c. Greenhouse. See Fig. 459.

Hypolepis—*continued.*

H. anthriscifolia (of gardens). This hardy plant is quite distinct from the previous species. *rhiz.* small, wiry. *sti.* slender, short, slightly hairy. *fronds* quadripinnatifid, resembling those of the Lace Fern (*Cheilanthes elegans*), 6in. to 7in. long, 2½in. to 3in. broad. SYNS. *Cheilanthes anthriscifolia* and *Microlepia anthriscifolia* (of gardens).

H. millefolia (Milfoil-like). *rhiz.* stout, wide-creeping. *sti.* erect, about 6in. long, pale brown. *fronds* broadly triangular, 1ft. or more in length, 4in. to 6in. broad, stalked, slightly hairy below; pinnæ having their stalks slightly winged; ultimate segments sharply toothed. *sori* placed in the lower sinuses only. New Zealand. Greenhouse.

H. radiata (rayed). A garden name for *Cheilanthes radiata.*

H. spectabilis (remarkable). A synonym of *Cheilanthes chlorophylla.*

HYPOLYTRUM. SYNS. *Albikia, Beera, Hypælyptum* (in part), *Hypelytrum, Tunga.* Spikes panicled, the branches rigid; bracts long and leaf-like. Leaves flat, somewhat thin, three-nerved, gradually narrowed to each end. Stem with some nodes far above the base. To the species described on p. 170, Vol. II., the following should be added:

H. Schraderianum (Schrader's). *l.* tufted, 2½ft. long, 2in. broad, entire, green with purple margins. Brazil, 1893. A stout, Grass-like plant. (I. H. 1895, p. 25, f. 5.)

HYPONOMEUTA PADELLA (Small Ermine Moth). This insect, described and illustrated under **Hawthorn Caterpillars,** is a great pest to the Apple-grower; it is also found upon the Blackthorn, but so far it does not appear to have been destructive to cultivated Plums, though it is, nevertheless, a most undesirable orchard visitor. Feeding, as the larvæ do, in a common web, they should be readily destroyed by holding underneath the nest a pail containing boiling water, into which the cut-out colony should be thrown.

HYPOPHYLLANTHUS LINDENI. This is the correct name of *Erythrochiton Hypophyllanthus,* which is now classed as a distinct, monotypic genus.

HYPOTHRONIA. A synonym of **Hyptis** (which *see*).

HYPOXIS. Of this genus fifty-one species have been enumerated; they are found in tropical Asia, Australia, the Mascarene Islands, tropical and South Africa, and tropical and North America. Perianth tube none, the segments six, sub-equal, spreading; stamens six; ovary three-celled. To the species described on p. 171, Vol. II., the following should be added:

H. colchicifolia (Colchicum-leaved). *fl.*, perianth 1¼in. in diameter, the segments bright yellow inside, greenish-yellow and slightly hairy on the back, oblong-lanceolate; peduncle slender, three- or four-flowered. Autumn. *l.* in a tuft about 1ft. high; produced ones six to eight, oblong or oblong-lanceolate, the largest 6in. to 8in. long, 1½in. to 2in. broad, glabrous. Corm globose, 2in. in diameter. Cape of Good Hope, 1834.

H. hemerocallidea (Hemerocallis-like). The correct name of *H. elata.*

H. Baurii and *H. villosa* (SYN. *H. pannosa*) have also been introduced.

HYPTIS (from *hyptios,* resupinate: the limb of the corolla is turned on its back). SYNS. *Brotera* (of Sprengel), *Hypothronia, Rhaphiodon, Schaueria.* ORD. *Labiatæ.* A huge genus (about 250 species) of mostly stove herbs, under-shrubs or shrubs, of polymorphous habit and inflorescence, natives of the warmer parts of America. Calyx teeth five, usually acute or subulate; corolla sub-bilabiate, the lowest lobe abruptly deflexed; stamens four, didynamous. Only one species calls for mention here. It is a greenhouse or half-hardy annual, requiring ordinary treatment.

H. suaveolens (sweet-smelling). *fl.* pale blue, rather pretty; corolla shortly exserted; heads few-flowered, racemose-paniculate and axillary. *l.* petiolate, ovate, or the lower ones cordate, doubly serrated or almost sinuate. West Indies, &c., 1839. SYN. *Ballota suaveolens.*

HYSTERIA. A synonym of **Corymbis** (which *see*).

HYSTERIUM PINASTRI. *See* **Pinus—Fungi.**

HYSTRIX. A synonym of **Asperella** (which *see*).

IANTHE (of Salisbury). A synonym of **Hypoxis** (which *see*).

IBERIS. This genus embraces about forty species of annual, biennial, or perennial herbs or under-shrubs. Siliquas flat-compressed, ovate at base, entire or emarginate at apex. To the species described on pp. 171-2, Vol. II., the following should be added:

I. affinis (related). A synonym of *I. panduræformis.*

I. contracta (contracted). *fl.* white. May. *fr.* in a much-contracted corymb. *l.* linear, slightly cuneate, toothed. Stems glabrous, sub-shrubby. *h.* 6in. Spain, 1824. There is a form *rosea*, with rose-coloured flowers. 1839.

I. corifolia (Coris-leaved).* *fl.* white, small. This pretty species in general appearance resembles *I. semperrirens*, but is of a much dwarfer character, not exceeding 3in. in height

I. florida (flowery). A synonym of *I. semperflorens.*

I. Lagascana (Lagasca's). *fl.* white, in compact corymbs. May to July. *fr.*, siliquas sub-corymbose, very acutely bilobed. *l.* oblong, somewhat spathulate, toothed at apex. *h.* 8in. to 12in. Murcia, &c. Annual. SYN. *I. pubescens.*

I. linifolia (Linum-leaved). *fl.* pink, in hemispherical, terminal corymbs. June to September. *fr.*, siliquas corymbose, bidentate. *l.* linear, entire; radical ones somewhat toothed. *h.* 8in. to 12in. Spain, &c. Plant glabrous, annual or perennial.

I. panduræformis (fiddle-shaped). *fl.* white, in dense, umbelliform racemes. *fr.*, siliquas rounded-ovate. *l.* dark green, ciliated-pubescent or nearly glabrous, pinnatifid, with linear, obtuse lobes. Branches simple or corymbose. *h.* 6in. to 12in. Central France. Annual or biennial. SYN. *I. affinis.*

I. petræa (rock-loving).* A variety of *I. Tenoreana.*

I. pinnata (pinnate).* *fl.* white, scented, corymbose. *fr.*, siliquas in a short, often umbelliform raceme. *l.* oblong-linear, pinnatifid or pinnatipartite; segments linear, obtuse. *h.* 6in. to 12in. Central and Southern Europe. Annual or biennial.

I. pubescens (downy). A synonym of *I. Lagascana.*

I. stylosa (large-styled). A synonym of *Noccæa stylosa.*

I. Tenoreana petræa (rock-loving).* *fl.* white, tinged with red in the centre. A pretty rockery variety.

Varieties. Of the annual Candytufts many handsome garden varieties are to be had, some of the best being Blush Queen, Dunnetti, Giant-Flowered, Normandy, and Tom Thumb White. The last, growing only about 6in., makes a pretty edging plant.

IBIDIUM. A synonym of **Spiranthes** (which *see*).

ICACO. A synonym of **Chrysobalanus** (which *see*).

ICACOREA. Included under **Ardisia** (which *see*). *I. guianensis* is synonymous with *A. acuminata.*

ICHNEUMON FLIES. Ordinarily these are supposed to consist of members of the *Ichneumonidæ* proper; but the term may be said to embrace the closely-allied family *Braconidæ*, which latter may be broadly distinguished from the former by the number of cells which traverse the wing. In the former they are three, and in the latter four. There are many other microscopic differences, which it would serve no good purpose to discuss here. In their life-histories these two families have much in common, the larvæ of each living parasitically in the bodies of larvæ, or it may be of pupæ, or less often in the perfect insects themselves. Belonging to the *Braconidæ* is a most useful and most abundant species in *Apanteles glomeratus* (Fig. 460), which is largely responsible for

FIG. 460. APANTELES GLOMERATUS (ICHNEUMON FLY OF WHITE BUTTERFLIES).

keeping in check the very numerous White Butterflies (*Pieris*), whose larvæ feed chiefly upon Cabbages. The appearance of these "ichneumoned" larvæ is very familiar, the yellowish cocoons of the parasite being well in evidence. *A. glomeratus* deposits its eggs upon the

Ichneumon Flies—*continued.*

unfortunate host, and the parasitic larvæ work into the living insects. They do not, as is popularly supposed, eat them alive, but feed upon the non-vital parts. The lepidopterous larvæ continue to feed, and if anything with greater voracity, until they are about to become pupæ, when they usually die. Occasionally, however, the parasites are found upon the pupæ as well as upon the imagines when they emerge. Fig. 460 gives an idea of the outward conformation of *A. glomeratus*, though in the process of reproduction the series of cells upon the wings have been obliterated.

In the *Ichneumonidæ* proper are insects which live as parasites even upon wood-feeding insects like *Sirex*, found in decaying Conifers of various kinds. These belong to the genera *Rhyssa* and *Thalassa*, and are provided with long ovipositors, so constructed as to enable them to bore. As showing the great value of Ichneumon Flies in preserving the balance, it may be cited that no less than fifty species are parasitic upon that pest of the fruit cultivator, the Winter Moth; that upwards of 1200 species of the *Ichneumonidæ* alone are indigenous to this country; and that 1200 specimens of one parasite have been bred from a single lepidopterous larva. This latter statement is on the authority of Dr. Sharp.

ICICA. A synonym of **Bursera** (which *see*).

ICTODES. A synonym of **Symplocarpus** (which *see*).

IDRIA COLUMNARIA. This is probably identical with **Fouquiera spinosa** (which *see*).

IGUANURA SPERANSKYANA. According to the Kew authorities, this is probably the correct name of the plant described as **Geonoma Pynærtiana** (which *see*).

ILEX. In addition to seeds, budding, and grafting, the varieties of *Ilex* may also be very successfully increased by cuttings of the current season's matured wood, 2in. or 3in. long, dibbled in sandy soil on a warm, sheltered border in August, and covered with hand-lights or a frame. The lower leaves should be removed, and a clean cut with a sharp knife made just below a joint. It is very important that the cuttings should be made quite firm at the base. Water with a fine rose water-pot twice or three times a week, and shade from the sun with tiffany, mats, &c. Beyond giving a chink of air occasionally to allow superfluous moisture to escape, very little ventilation will be necessary until the cuttings have callused and roots are being emitted. Plants raised from cuttings are rather slow in growth for a season or two, but when properly established they grow just as freely as worked plants, and for some reasons are to be preferred to those raised by budding or grafting, the latter being more or less troublesome on account of the suckers and growths which appear on the stock below the scion. The pendulous varieties may be worked at the desired height from the ground-line on stocks of the common species.

In transplanting Hollies, it is always advisable to lift them with good balls of earth, and preserve the roots intact. This operation is best performed in early autumn, while the atmosphere is charged with moisture, as the trees then have sufficient time in which to make fresh roots before winter sets in, and in spring they will start into growth without feeling a check. Avoid planting in very dry, windy weather; but if it is carried out at such a time, give a good watering at the roots and overhead as soon as planting is completed. If the weather remains dry, repeat the waterings at intervals. Hollies are considerably improved by frequent transplantings, as they are then encouraged to make large quantities of fibrous roots, which would not be the case if the plants were left undisturbed for protracted periods during the first few years of their existence.

To the species and varieties described on pp. 174-7, Vol. II., the following should be added:

I. canadensis (Canadian). A synonym of *Nemopanthes canadensis.*

I. caroliniana (Carolina). A synonym of *I. Cassine.*

I. Cassine. *I. caroliniana*, *I. floridana*, and *I. vomitoria* are synonymous with this species.

Ilex—*continued.*

I. conocarpa (cone-fruited). *fl.* white, small, in short, axillary racemes. *l.* lanceolate, serrulated, 4in. long. *h.* 6ft. Brazil, 1893. A greenhouse or stove shrub, chiefly interesting as being one of the plants which yield Maté, or Paraguay Tea. (B. M. 7310.)

I. Cunninghami (Cunningham's). A synonym of *I. dipyrena.*

I. Fischeri (Fischer's). A garden form of *I. Aquifolium.*

I. floridana (Florida). A synonym of *I. Cassine.*

I. Gongonha is synonymous with *Villaresia mucronata.*

I. insignis (remarkable).* *fl.* four-parted, ¼in. in diameter, in sub-globose clusters. *fr* globose, ¼in. in diameter. *l.* very thick, 6in. to 9in. long, acute, elliptic-lanceolate, obscurely serrated, the young ones spiny-toothed; petioles stout, ¾in. to 1in. long. Sikkim Himalaya, 1880. A small, erect, evergreen tree.

I. microcarpa (small-fruited). A synonym of *I. rotunda.*

I. Pedaro. A synonym of *I. Aquifolium maderensis.*

I. quercifolia (Oak-leaved). The correct name of *I. opaca.*

I. rotunda (round). *fl.* in axillary umbels, borne on peduncles much shorter than the petioles. *l.* entire, ovate, acute at both ends, glabrous. North China. SYN. *I. microcarpa.*

I. vomitoria (vomitory). A synonym of *I. Cassine.*

FIG. 461. FLOWER AND LEAVES OF IMPATIENS HAWKERI.

I. Wilsoni (Wilson's).* This is described as a splendid Holly, of sturdy growth, with stout foliage, and deep red, showy berries as large as small Cherries. 1899.

I. Green-leaved Varieties.

I. Aquifolium atrovirens (dark green). *l.* large, flat, pale green. SYN. *I. A. maderensis atrovirens.*

I. A. camelliæfolia (Camellia-leaved). *l.* entire, not spiny, flat, resembling those of a Camellia. 1888.

I. A. latispina (broad-spined).* *l.* broad, with long spines, very free.

I. A. maderensis atrovirens. A synonym of *I. A. atrovirens.*

I. A. nigrescens (blackish). *l.* large, broad, and smooth.

II. Silver- and Gold-leaved Varieties.

I. Aquifolium argentea regina (Silver Queen).* *l.* large, broadly margined with white. Showy and of good habit.

I. A. flavescens (yellowish).* *l.* blotched and suffused with yellow. This is popularly known as Moonlight.

I. A. Golden King. An improvement upon the well-known Golden Queen, being larger in leaf and deeper as to colour. A sport from Hodgins' Holly.

I. A. Moonlight. A synonym of *I. A. flavescens.*

ILLAWARRA PALM. *See* **Ptychosperma Cunninghamiana.**

ILLAWARRA PINE. *See* **Podocarpus spinulosa.**

ILLICIUM. To the species described on p. 177, Vol. II., the following should be added:

I. verum (true). True Star Anise. *fl.* red, axillary, shortly pedunculate, globose; perianth leaflets about ten, orbicular, concave. November. *l.* elliptic-lanceolate or oblanceolate, obtuse or obtusely acuminate, shortly narrowed into the petioles. *h.* 9ft. South China, 1883. (B. M. 7005.)

IMAGO (*pl.* **IMAGINES**). The adult and usually winged condition of an insect.

IMANTOPHYLLUM. To the species described on p. 178, Vol. II., the following varieties should be added. For garden varieties *see* **Clivia.**

I. miniatum aurantiacum (orange). *fl.* bright yellowish-salmon, 3in. in diameter; umbels large. 1886. Garden seedling.

I. m. blandfordiæflorum striatum (Blandfordia-flowered, striped).* *fl.* crimson-carmine outside, Blandfordia-like, borne in dense heads, the segments margined with salmon-buff. *l.* striated with creamy-yellow. 1889.

I. m. cruentum (bloody).* *fl.* bright orange-scarlet, of fine form and substance. Spring.

IMBRICARIA (from *imbrico*, to cover like tiles; in allusion to the biseriate calyx segments). SYN. *Binectaria.* ORD. *Sapotaceæ.* A small genus (four or five species) of stove, milky trees, closely allied to *Mimusops*, natives of tropical Africa and the Mascarene Islands. *I. maxima* (SYN. *I. borbonica*) has been introduced, but it is probably only grown in botanical collections.

IMMORTELLE. *See also* **Gomphrena** and **Helipterum.**

IMPATIENS. To the species described on pp. 179-80, Vol. II., the following should be added. Most of them require stove treatment.

I. aurea (golden). The correct name of *I. pallida.*

I. auricoma (golden-haired).* *fl.* golden-yellow, streaked with red within; petals five, the lateral ones connate in pairs, the dorsal one beak-tipped, with a short, bifid, curved spur. April. *l.* 6in. long, alternate, lanceolate, acuminate, with bristles between the crenatures, the midrib (as well as the stem and branches) reddish. *h.* 6in. to 2ft. Comoro Islands, 1893. Perennial. (B. M. 7381.)

I. biflora (two-flowered). The correct name of *I. fulva.*

I. candida is a variety of *I. Roylei.*

I. comorensis (Comoro Islands). *fl.* bright carmine, large, with a white, bifid spur. *l.* elliptic-lanceolate, acute, crenate. Comoro Islands, 1887. A pretty plant, of vigorous growth.

I. cuspidata (cuspidate). A synonym of *I. latifolia.*

I. Episcopi (Bishop Hannington's). A form *of I. Sultani.*

I. fasciculata (fascicled). A synonym of *I. chinensis.*

I. fulva. The correct name is *I. biflora.*

I. glandulifera (of Royle) and *I. glanduligera* (of gardens). Synonyms of *I. Roylei.*

I. Hawkeri (Lieut. Hawker's).* *fl.* brownish-red, large, very showy, axillary, solitary or corymbose; claws of the segments white, marked blue; sepals and petals broad, the dorsal sepal rounded, the lateral lobes oblong; spur red, recurved. Summer. *l.* glabrous, shortly petiolate, 4½in. long, 2in. broad, opposite or ternate, very acutely serrated, ovate-elliptic, acuminate. Sunda Islands, 1886. A branched herb. See Fig. 461, for which we are indebted to Messrs. Bull and Sons. (I. H. ser. v. 2.)

I. latifolia (broad-leaved). *fl.* rosy, 1in. to 1¾in. across, solitary in the axils of the leaves, having a long, filiform spur. *l.* lanceolate, acuminate, 2in. to 5in. long, acute at base, serrated. Stems glaucous. Birma, 1884. SYN. *I. cuspidata.*

I. longicornu (long-horned), of Wallich. A synonym of *I. amphorata.*

I. Mariannæ (Marian's). *fl.* light purple, rather large, cymose; lip with a longish, slender, hooked spur; standard with a hairy ridge extending into a projection at about one-third below the top. June. *l.* cuneate-oblong, acute, serrated, deep green, with light areas between the veins. Stems thickish, hairy. Assam, 1831. Greenhouse annual.

I. Micholitzii (Micholitz'). *fl.* white or pink, with a dark pink centre. New Guinea, 1892. A dwarf, bushy species.

I. mirabilis (remarkable).* *fl.* golden-yellow, very large, curiously inflated, axillary; lateral petals coalescing in one. August. *l.* tufted at the apex of the trunk, long-petiolate,

Impatiens—*continued.*

ovate, crenate, fleshy, spreading, 1ft. long. Trunk 4ft. high and as thick as a man's leg (in its native country). Langkawi Island, 1891. (B. M. 7195.)

I. Noli-tangere. The correct name of *I. noli-me-tangere.*

I. pallida. The correct name is *I. aurea.*

I. Rodigasi (Rodigas'). *fl.* rosy-purple, axillary, with the long, slender spur curved forwards; pedicels long. *l.* opposite or whorled, ovate-lanceolate, acute, serrated. Java, 1889. A pretty Balsam. (I. H. 1889, p. 25, t. 78.)

I. Roylei pallidiflora (pale-flowered).* *fl.* pale pink, spotted with red, larger than in the type; corymbs 6in. to 10in. broad. *l.* 6in. to 8in. long. *h.* 5ft. to 6ft. Himalayas. (B. M. 7647.)

I. Sultani Episcopi (Bishop Hannington's).* *fl.* rich purple-carmine, shot with a brilliant rosy hue. Zanzibar, 1886. A perpetual-flowering variety.

IMPATIENT. Used in a garden sense, this term implies that a plant cannot withstand any excess of a particular condition; *ex. gr.*, Impatient of heat or cold.

IMPERFECT. This term is applied to flowers that lack either stamens or pistils.

INCARVILLEA. Amongst plants for outside culture of comparatively recent introduction none is more beautiful than *I. Delavayi*, which has proved itself perfectly hardy. In height it grows some 2ft., and it may be placed in the borders; or seedlings plentifully employed in the beds of hardy subjects now so often seen would prove very decorative and uncommon.

To the species described on p. 181, Vol. II., the following should be added:

I. arguta (sharp). A synonym of *Amphicome arguta.*

I. Delavayi (Delavay's).* *fl.*, corolla bright rose-red, the tube 3in. long, decurved, the limb 3in. to 3½in. broad; scape three- to thirteen-flowered. May. *l.* few, radical, 1ft. to 1½ft. long, pinnate; leaflets six to eight, rather distant, 4in. to 5in. long,

Incarvillea—*continued.*

I. variabilis (variable). *fl.* bright rose-purple, in loose, erect racemes; corolla tube 1in. long, slightly curved, the limb more than 1in. across. August. *l.* all alternate, 2in. to 4in. long, shortly petiolate, ovate, pinnate; leaflets six to eight pairs. *h.* 1ft. to 1½ft. Western China, 1898. A half-hardy, slender perennial. (B. M. 7651.)

INCOMPLETE. Lacking some part. *See* **Incompletæ.**

INCURVARIA CAPITELLA. *See* **Currant-Shoot Moth.**

INDIAN BERRY. *See* **Randia aculeata.**

INDIAN CUP. *See* **Sarracenia.**

INDIAN CURRANT. *See* **Symphoricarpus vulgaris.**

INDIAN FLOWERING FERN. *See* **Helminthostachys.**

INDIAN GRASS. *See* **Arundo.**

INDIAN HILL GUAVA. *See* **Rhodomyrtus tomentosa.**

INDIAN MALLOW. *See* **Sida** and **Urena.**

INDIAN or EGYPTIAN LOTUS. *See* **Nymphæa Lotus.**

INDIAN PHYSIC. *See* **Magn[illegible]aseri.**

INDIAN SHAMROCK. *See* **Ti[illegible].**

INDIAN WILD PEPPER. *See* **[illegible]ex trifolia.**

INDIGENOUS. Native.

INDIGOFERA. To the information given on p. 181, Vol. II., the following should be added:

I. Dosua compacta (compact). A synonym of *I. Gerardiana ompacta.*

D. stricta (erect). An erect, garden form, with violet-red lowers. 1870.

Gerardiana alba (white). *fl.* pure white, produced in erect acemes. 1891. Nearly hardy.

G. compacta (compact). *fl.* of a vinous-rose colour; nflorescence very compact. 1877. SYN. *I. Dosua compacta.*

Iwafusi (native name). *fl.* white, washed with pink, very legant. Summer. Japan. A small tree.

violacea. The correct name is *I. pulchella.*

:NGA. To the information given on p. 182, Vol. II., following should be added:

anomala (anomalous). *fl.* red; heads few-flowered, twin, isposed in terminal racemes. May to August. *l.*, leaflets five seven pairs, linear, obtuse, glabrous, ciliated. *h.* 6ft. to 12ft. lexico, 1729. *Calliandra grandiflora* is the correct name of iis species.

ferruginea (rusty). A synonym of *I. vulpina.*

Harrisii (Harris's). A synonym of *Calliandra Harrisii.*

pulcherrima is identical with *Calliandra Tweedii.*

setifera (bristle-bearing). The correct name of *I. macrophylla* (of B. M.).

vulpina (fox-like). *fl.* purplish, disposed in a pretty, rminal spike. *l.* compound, and, as well as the branches, overed with yellowish hairs. Brazil. Tree. SYN. *I. ferruginea* . d. S. viii., 773).

NGENHOUSSIA. A synonym of **Amphithalea** ich *see*).

NOCULATION. Another name for **Budding** ich *see*).

NSECTICIDES. In gardening these may be cribed as preparations which destroy animal pests erally, and not insects only, as the name would at t sight seem to suggest. They vary greatly with the ts under consideration, and the universal Insecticide yet to be discovered. With some plant-feeding mals the employment of Insecticides is practically less, owing to the peculiar habits of the pests—shoot- trunk-infesting kinds, which feed protected, like Wood pard and Goat Moths, Currant-Shoot Moths, Leaf isters (*Tortrices*), Case-Makers, &c.

efore any Insecticide can be used effectively, the dener must determine how the pest feeds, as on that h depends. A poisonous Insecticide that would be fatal a chewing insect, like the caterpillars of Moths, &c., ld be harmless in the case of a sucking insect or r animal, which, before taking any nutriment from leaves, first bores through the poison area. Then,

Ilex—*continued.*

I. conocarpa (cone-fruited). *fl.* white, small, in short, axillary racemes. *l.* lanceolate, serrulated, 4in. long. *h.* 6ft. Brazil, 1893. A greenhouse or stove shrub, chiefly interesting as being one of the plants which yield Maté, or Paraguay Tea. (B. M. 7310.)

I. Cunninghami (Cunningham's). A synonym of *I. dipyrena.*

I. Fischeri (Fischer's). A garden form of *I. Aquifolium.*

I. floridana (Florida). A synonym of *I. Cassine.*

I. Gongonha is synonymous with *Villaresia mucronata.*

I. insignis (remarkable).* *fl.* four-parted, ¼in. in diameter, in sub-globose clusters. *fr* globose, ¼in. in diameter. *l.* very thick, 6in. to 9in. long, acute, elliptic-lanceolate, obscurely serrated, the young ones spiny-toothed; petioles stout, ¾in. to 1in. long. Sikkim Himalaya, 1880. A small, erect, evergreen tree.

I. microcarpa (small-fruited). A synonym of *I. rotunda.*

I. Pedaro. A synonym of *I. Aquifolium maderensis.*

I. quercifolia (Oak-leaved). The correct name of *I. opaca.*

I. rotunda (round). *fl.* in axillary umbels, borne on peduncles much shorter than the petioles. *l.* entire, ovate, acute at both ends, glabrous. North China. SYN. *I. microcarpa.*

I. vomitoria (vomitory). A synonym of *I. Cassine.*

FIG. 461. FLOWER AND LEAVES OF IMPATIENS HAWKERI.

I. Wilsoni (Wilson's).* This is described as a splendid Ho of sturdy growth, with stout foliage, and deep red, shc berries as large as small Cherries. 1899.

I. Green-leaved Varieties.

I. Aquifolium atrovirens (dark green). *l.* large, flat, p green. SYN. *I. A. maderensis atrovirens.*

I. A. camelliæfolia (Camellia-leaved). *l.* entire, not spi flat, resembling those of a Camellia. 1888.

I. A. latispina (broad-spined).* *l.* broad, with long spi very free.

I. A. maderensis atrovirens. A synonym of *I. A. atrovir*

I. A. nigrescens (blackish). *l.* large, broad, and smooth.

II. Silver- and Gold-leaved Varieties.

I. Aquifolium argentea regina (Silver Queen).* *l.* la broadly margined with white. Showy and of good habit.

I. A. flavescens (yellowish).* *l.* blotched and suffused w yellow. This is popularly known as Moonlight.

I. A. Golden King. An improvement upon the well-kn Golden Queen, being larger in leaf and deeper as to col A sport from Hodgins' Holly.

I. A. Moonlight. A synonym of *I. A. flavescens.*

ILLAWARRA PALM. *See* **Ptychosperma Cunninghamiana.**

ILLAWARRA PINE. *See* **Podocarpus spinulosa.**

ILLICIUM. To the species described on p. 177, Vol. II., the following should be added:

I. verum (true). True Star Anise. *fl.* red, axillary, shortly pedunculate, globose; perianth leaflets about ten, orbicular, concave. November. *l.* elliptic-lanceolate or oblanceolate, obtuse or obtusely acuminate, shortly narrowed into the petioles. *h.* 9ft. South China, 1883. (B. M. 7005.)

IMAGO (*pl.* **IMAGINES**). The adult and usually winged condition of an insect.

IMANTOPHYLLUM. To the species described on p. 178, Vol. II., the following varieties should be added. For garden varieties *see* **Clivia.**

I. miniatum aurantiacum (orange). *fl.* bright yellowish-salmon, 3in. in diameter; umbels large. 1886. Garden seedling.

I. m. blandfordiæflorum striatum (Blandfordia-flowered, striped).* *fl.* crimson-carmine outside, Blandfordia-like, borne in dense heads, the segments margined with salmon-buff. *l.* striated with creamy-yellow. 1889.

I. m. cruentum (bloody).* *fl.* bright orange-scarlet, of fine form and substance. Spring.

IMBRICARIA (from *imbrico*, to cover like tiles; in allusion to the biseriate calyx segments). SYN. *Binectaria.* ORD. *Sapotaceæ.* A small genus (four or five species) of stove, milky trees, closely allied to *Mimusops*, natives of tropical Africa and the Mascarene Islands. *I. maxima* (SYN. *I. borbonica*) has been introduced, but it is probably only grown in botanical

INCARVILLEA DELAVAYI.

By an unfortunate error, which was not discovered in time, the printers used a wrong block for illustrating Incarvillea Delavayi. It should have been as above; that which was given was of *Kalanchoe Marmorata.*

Impatiens—*continued.*

ovate, crenate, fleshy, spreading, 1ft. long. Trunk 4ft. high and as thick as a man's leg (in its native country). Langkawi Island, 1891. (B. M. 7195.)

I. Noli-tangere. The correct name of *I. noli-me-tangere.*

I. pallida. The correct name is *I. aurea.*

I. Rodigasi (Rodigas'). *fl.* rosy-purple, axillary, with the long, slender spur curved forwards; pedicels long. *l.* opposite or whorled, ovate-lanceolate, acute, serrated. Java, 1889. A pretty Balsam. (I. H. 1889, p. 25, t. 78.)

I. Roylei pallidiflora (pale-flowered).* *fl.* pale pink, spotted with red, larger than in the type; corymbs 6in. to 10in. broad. *l.* 6in. to 8in. long. *h.* 5ft. to 6ft. Himalayas. (B. M. 7647.)

I. Sultani Episcopi (Bishop Hannington's).* *fl.* rich purple-carmine, shot with a brilliant rosy hue. Zanzibar, 1886. A perpetual-flowering variety.

IMPATIENT. Used in a garden sense, this term implies that a plant cannot withstand any excess of a particular condition; *ex. gr.*, Impatient of heat or cold.

IMPERFECT. This term is applied to flowers that lack either stamens or pistils.

INCARVILLEA. Amongst plants for outside culture of comparatively recent introduction none is more beautiful than *I. Delavayi*, which has proved itself perfectly hardy. In height it grows some 2ft., and it may be placed in the borders; or seedlings plentifully employed in the beds of hardy subjects now so often seen would prove very decorative and uncommon.

To the species described on p. 181, Vol. II., the following should be added:

I. arguta (sharp). A synonym of *Amphicome arguta.*

I. Delavayi (Delavay's).* *fl.*, corolla bright rose-red, the tube 3in. long, decurved, the limb 3in. to 3½in. broad; scape three- to thirteen-flowered. May. *l.* few, radical, 1ft. to 1½ft. long, pinnate; leaflets six to eight, rather distant, 4in. to 5in. long, sessile. Stem very short, simple or sparingly branched. China, 1893. Hardy. (B. M. 7462; R. H. 1895, 544.) See Fig. 462.

FIG. 462. FLOWERS OF INCARVILLEA DELAVAYI.

I. grandiflora (large-flowered). *fl.* of a rich rose-red; scape short, bearing one or two flowers. *l.* and leaflets shorter than in *I. Delavayi* (which this species closely resembles). China, 1898. Greenhouse.

I. grandiflora (of Poir). A synonym of *Tecoma grandiflora.*

I. tomentosa (downy), of Roxburgh. A synonym of *Paulownia imperialis.*

Incarvillea—*continued.*

I. variabilis (variable). *fl.* bright rose-purple, in loose, erect racemes; corolla tube 1in. long, slightly curved, the limb more than 1in. across. August. *l.* all alternate, 2in. to 4in. long, shortly petiolate, ovate, pinnate; leaflets six to eight pairs. *h.* 1ft. to 1½ft. Western China, 1898. A half-hardy, slender perennial. (B. M. 7651.)

INCOMPLETE. Lacking some part. *See* **Incompletæ.**

INCURVARIA CAPITELLA. *See* **Currant-Shoot Moth.**

INDIAN BERRY. *See* **Randia aculeata.**

INDIAN CUP. *See* **Sarracenia.**

INDIAN CURRANT. *See* **Symphoricarpus vulgaris.**

INDIAN FLOWERING FERN. *See* **Helminthostachys.**

INDIAN GRASS. *See* **Arundo.**

INDIAN HILL GUAVA. *See* **Rhodomyrtus tomentosa.**

INDIAN MALLOW. *See* **Sida** and **Urena.**

INDIAN or EGYPTIAN LOTUS. *See* **Nymphæa Lotus.**

INDIAN PHYSIC. *See* **Magn[illegible]aseri.**

INDIAN SHAMROCK. *See* **Ti[illegible].**

INDIAN WILD PEPPER. *See* **[illegible]ex trifolia.**

INDIGENOUS. Native.

INDIGOFERA. To the information given on p. 181, Vol. II., the following should be added:

I. Dosua compacta (compact). A synonym of *I. Gerardiana compacta.*

I. D. stricta (erect). An erect, garden form, with violet-red flowers. 1870.

I. Gerardiana alba (white). *fl.* pure white, produced in erect racemes. 1891. Nearly hardy.

I. G. compacta (compact). *fl.* of a vinous-rose colour; inflorescence very compact. 1877. SYN. *I. Dosua compacta.*

I. Iwafusi (native name). *fl.* white, washed with pink, very elegant. Summer. Japan. A small tree.

I. violacea. The correct name is *I. pulchella.*

INGA. To the information given on p. 182, Vol. II., the following should be added:

I. anomala (anomalous). *fl.* red; heads few-flowered, twin, disposed in terminal racemes. May to August. *l.*, leaflets five to seven pairs, linear, obtuse, glabrous, ciliated. *h.* 6ft. to 12ft. Mexico, 1729. *Calliandra grandiflora* is the correct name of this species.

I. ferruginea (rusty). A synonym of *I. vulpina.*

I. Harrisii (Harris's). A synonym of *Calliandra Harrisii.*

I. pulcherrima is identical with *Calliandra Tweedii.*

I. setifera (bristle-bearing). The correct name of *I. macrophylla* (of B. M.).

I. vulpina (fox-like). *fl.* purplish, disposed in a pretty, terminal spike. *l.* compound, and, as well as the branches, covered with yellowish hairs. Brazil. Tree. SYN. *I. ferruginea* (F. d. S. viii., 773).

INGENHOUSSIA. A synonym of **Amphithalea** (which *see*).

INOCULATION. Another name for **Budding** (which *see*).

INSECTICIDES. In gardening these may be described as preparations which destroy animal pests generally, and not insects only, as the name would at first sight seem to suggest. They vary greatly with the pests under consideration, and the universal Insecticide has yet to be discovered. With some plant-feeding animals the employment of Insecticides is practically useless, owing to the peculiar habits of the pests—shoot- and trunk-infesting kinds, which feed protected, like Wood Leopard and Goat Moths, Currant-Shoot Moths, Leaf Twisters (*Tortrices*), Case-Makers, &c.

Before any Insecticide can be used effectively, the gardener must determine how the pest feeds, as on that much depends. A poisonous Insecticide that would be fatal to a chewing insect, like the caterpillars of Moths, &c., would be harmless in the case of a sucking insect or other animal, which, before taking any nutriment from the leaves, first bores through the poison area. Then,

Insecticides—*continued.*

too, the time at which Insecticides may be most effectively used will vary with the species. Take the Scales. To spray on an Insecticide when the Scale-like coverings of certain species have been formed, avails but little: the time is when the newly-hatched larvæ are on the wander.

Timely application of Insecticides is very important, and this is especially the case with crops which are destined for market or the table, when appearance is everything. Insects on outdoor crops are, as a rule, more difficult to control than those on indoor ones. A very important point in connection with any Insecticide is to be certain as to its effect upon any plant before applying it wholesale. An indiscriminate application upon a tree or plant may lead to disaster.

For poisoning the food-plants of chewing insects like the larvæ of Moths, Butterflies, and Sawflies, the grubs of Beetles which feed exposed, as well as the Beetles themselves that lay the green parts of plants under contribution, Paris Green (despite the prejudice against its use), in the proportion of 1oz. to 20 gallons of water, is the best Insecticide. Many growers also add 1oz. of lime, as this minimises the chances of the foliage being injured. The mixture should be kept stirred, or the Paris Green will settle, and it should be distributed in a nice fine spray. With fruit trees on no account should the preparation be employed when they are in blossom. So far as the fruit itself is concerned there is not the slightest danger to the consumer if the arsenite is used in the proportion stated. Manufacturing agricultural chemists, like Mackey and Mackey, of Bermondsey, keep Paris Green Paste ready for making the Insecticide; and this is preferable to having to mix the powder one's self, an operation fraught with not a little risk. London Purple is another powerful arsenical poison, and needs to be just as carefully handled.

Hellebore (in powder) dusted or blown on to the trees in the early morning is also a capital Insecticide, especially in the case of the Sawfly and Caterpillar grubs on Gooseberries. Although a strong poison, Hellebore is soon rendered harmless by contact with the outside air, and must therefore be renewed.

For sucking animals, one of the best all-round preparations is Kerosene (paraffin) Emulsion. If properly made the kerosene does not separate and cause injury to the plants. It may be procured in this country in a concentrated form, and all that the user has to do is to dilute it to the proper proportions, which will vary somewhat with the kind of tree under treatment and the age of the leaves. The ingredients are hard or soft soap, kerosene, and rain water. Their proper amalgamation requires some skill. The younger the foliage the weaker the solution. The exact proportion may be determined by the gardener himself. These emulsions are best bought from firms with the machinery for making them.

A very good home-made preparation for similar insects consists of 1 wineglassful of ordinary petroleum and 3 gallons of hot water. The difficulty about this solution is that the petroleum does not readily amalgamate, and constant stirring is necessary. It is a very good plan to put sufficient soft soap in the water to discolour it, as this has been found preferable to plain water.

Soft soap alone is a capital Insecticide for Scale. 2oz. to a gallon of hot water may be safely employed upon hard-wooded greenhouse subjects, but upon softer things the soap may be reduced one-half. For rubbing into the bark of trees it may be used at from three to four times the strength of that first named.

Water applied at a temperature of 140deg. is a most useful Insecticide, especially for Scale. It has the merit, too, of being harmless to the plants under treatment—neither leaves, flowers, nor fruits being affected. Aphides readily succumb to it, as do Thrips. In the case of Cactuses suffering from insect pests—Mealy Bug, &c.—the hot-water treatment may be very successfully employed, first turning the plants on their sides. The great difficulty is in keeping the water sufficiently hot: it quickly cools on delivery.

Hard-bodied insects, like many of the Beetles, are difficult to cope with where they do not actually feed upon the green portions of the trees or plants, their horny wing-cases protecting them against the Insecticides which kill by contact and that may be safely employed. Many of the most troublesome Weevils, all of which are

Insecticides—*continued.*

night feeders, are best shaken on to a board thickly smeared with tar and afterwards collected and destroyed.

Earwigs, Cockroaches, Ants, Wasps, and Wood-lice are best dealt with by traps or poisoned food. Red Spider (including the Bryobias) should be killed by contact when on outdoor trees; while indoors they should be treated to one of the vaporising Insecticides, except in the case of certain Grapes.

Fumigation by means of hydrocyanic acid gas is likely in the future to prove of immense benefit against many pests, as in the case of **Currant-Bud Mite** (which *see*) and some of the worst kinds of Scale. For years the former has baffled all the efforts of gardeners and economic entomologists to stay its ravages. From some extensive experiments, however, made by Mr. H. H. Cousins, M.A., Mr. A. V. Theobald, M.A., and others at the Wye Agricultural College, there is no doubt that the formidable foe may be ousted by the powerful Insecticide named, and a full report of the experiments appeared in the "Gardeners' Chronicle." Nearly twenty years ago this Insecticide was used in California for the destruction of Scale in the Orange groves, and proved of immense benefit. Great care has, however, to be taken that the fumes are not *inhaled*. So far as the Currant-Bud Mite is concerned, the best time for fumigation appears to be December and January. The cost is infinitesimal. In California tents are used for surrounding the infested trees; while in the experiments conducted at Wye a modification of this plan by the use of a waterproof cloth seems to have been employed. 1oz. of cyanide to 150 cubic feet Mr. Cousins and his colleagues found effectual.

The following is the formula for making the hydrocyanic gas: Cyanide of potassium, 1oz.; sulphuric acid, 2oz.; water, 3oz. The water is placed in a glazed earthenware vessel (an old jam-pot, for instance), and then the acid is put in; the waterproof tent or material is then placed round the bushes or trees to be freed, and the cyanide added. There is no necessity to go to great expense with the "tent." Mr. D. W. Coquillet, who was the first to discover the merits of hydrocyanic gas as an Insecticide, simply employed common bed-ticking treated with linseed oil. The covering is left round the tree for half to three-quarters of an hour.

Hydrocyanic gas has also been successfully employed as a greenhouse Insecticide in New South Wales, and it was found that not only did it destroy Thrips and Red Spider, but Scales, Ants, and Beetles. Still greater care would have to be exercised in a greenhouse, and the cyanide would have to be first suspended and controlled by a string from the outside, so that it could be dropped at the right moment. Several conditions are necessary, according to Mr. Hugh Dixson, who contributed a most practical article upon the subject to the "Gardeners' Chronicle." These are that the foliage of the plants be dry, that the wind is blowing away from any private residence, and that no persons are near the house at the time it is being treated, especially upon the lee side; and finally, that all vessels that the cyanide has touched be carefully washed and the water thrown down the sewer. Mr. Dixson says that 1 grain of cyanide for every cubic foot of the house, and an equal quantity of sulphuric acid diluted with an equal quantity of water, are the proper proportions.

Carbon bisulphide is employed for root-feeding insects like *Schizoneura lanigera*, found upon the roots, as well as the trunks and branches, of Apples, &c.; the **Grape Phylloxera** (which *see*); and the Cabbage Gall Weevil. Doubtless its sphere of usefulness may be considerably extended.

Borax is frequently used with success in plant-houses where Cockroaches abound, but rather as an expellent than as an Insecticide. In California, Resin Washes are much used for Scale, and they prove very effective; but in England and in other countries such washes are not called for. Resin Washes usually consist of resin, caustic soda, tallow or oil, and water; and less often paraffin.

Of the more recent commercial preparations for use in glasshouses, those known as vaporising Insecticides, like Nicoticide, XL All, and the like, are of great value if used with caution, and to a very great extent they have simplified the work in connection with the pests of stoves, greenhouses, conservatories, and fruit-houses. They are mostly tobacco preparations.

INTEGUMENT. A covering layer or membrane.

INTER. In compound words this signifies "between"; *e.g.*, Intercostal, between the ribs of a leaf. It should not be confounded with Intra, which means "within."

INTERMEDIATE HOUSE. In large gardens the value of the Intermediate House is great. It is, as it were, a connecting link between the stove and the greenhouse, or between the warmest Orchid-houses and the cool ones. Not only are there a multitude of plants that require the temperature of the Intermediate House all the year through, but there are also many other plants from the cooler structures that need a little extra heat at certain periods to make good growth, and there are also plants in the hottest houses that need a lower temperature, or period of rest, which can be best given in the Intermediate House, for which reasons such a house is practically a necessity where there are many plant-houses.

INTRA. In compound words this signifies "within"; *e.g.*, Intramarginal, within but near the margin. *See* **Inter.**

INULA. Of late years many species of these showy border plants have been introduced to gardens. They are much superior to the older *I. Helenium*, which is coarse and only suited to the wild garden. They are dwarf of habit, and some of them have bold foliage—*I. grandiflora*, for instance. They may be planted in either spring or autumn, at which seasons, too, they may be divided for purposes of increase.

To the species described on p. 190, Vol. II., the following should be added:

I. ensifolia (ensate-leaved).* *fl.-heads* one or several to a stem; scales lanceolate, erect, leaf-like, cobwebby-tomentose beneath. August. *l.* sessile, linear, strongly acuminate, many-nerved, glabrous. Stems erect. *h.* 9in. Caucasus, &c., 1793. (J. F. A. 162.)

I. grandiflora (large-flowered). *fl.*, involucral scales linear-subulate, fulvous-hirsute. July. *l.* sessile, oblong, slightly villous, serrated, the serratures glandular at apex. Stems simple, one-headed. *h.* 2ft. Caucasus, Persia, &c., 1810. (B. M. 1907, under name of *I. glandulosa* var.)

I. hirta (hairy). *fl.-heads* solitary or almost ternately corymbose; involucral scales hairy-ciliated, linear-lanceolate, the outer ones exceeding the inner ones. July. *l.* sessile, lanceolate-oblong, rigid, quite entire, the margins and nerves hairy. Stems erect, somewhat branched, pilose-hairy. *h.* 1ft. South Europe, 1759. (J. F. A. 358.)

I. salicina (Willow-like).* *fl.-heads*, involucre campanulate, the scales ovate-lanceolate, serrulate-scabrous, slightly reflexed at apex. July. *l.* half-amplexicaul, lanceolate, ciliate-scabrous on the margins, somewhat recurved at apex. Stems erect, corymbosely branched; branches one-headed. *h.* 1½ft. South Europe, &c., 1648. (F. D. 786.)

I. saxatilis (rock-loving). A synonym of *I. viscosa*.

I. squarrosa (squarrose). *fl.-heads* solitary or corymbose at the tips of the branches; involucre campanulate, the scales ovate, spreading-reflexed at apex. July. *l.* oblong, acuminate, serrated, more or less scabrid, reticulate-veined. Stems erect, slightly branched. *h.* 1ft. France, &c., 1768.

I. viscosa (clammy). *fl.-heads* having linear involucral scales. July. *l.* lanceolate, serrated, glandular-pilose, sessile, cordate-auricled; auricles reflexed. Stems erect, pilose-viscous, paniculately branched at apex; lateral branches leafy, few-headed. *h.* 1½ft. South Europe, 1596. SYN. *I. saxatilis.*

I. montana is also suitable for naturalising in the wild garden.

INVOLUCRARIA. Included under **Trichomanes** (which *see*).

IOCHROMA. *Lycium fuchsioides* is synonymous with *I. fuchsioides*. To the species described on p. 190, Vol. II., the following should be added:

I. flava (yellow). *fl.* in axillary clusters; corolla pale yellow, tubular, 1½in. long, with five short lobes. *l.* alternate, ovate-lanceolate, petiolate, glabrous above, finely puberulous below. *h.* 6ft. Cordilleras of Colombia, 1898. A bushy shrub. (R. H. 1898, p. 360.)

IONIDIUM includes *Pombalia*. *I. capense* is known as the Cape Violet.

IONOPSIDIUM. This genus is now included under *Cochlearia*.

IPHIGENIA (named after Iphigenia, daughter of Agamemnon). ORD. *Liliaceæ*. A small genus (four species) of stove or greenhouse, bulbous plants, closely allied to **Ornithoglossum** (which *see* for culture), natives of India, Africa, and Australia. Flowers small, erect,

Iphigenia—*continued.*

solitary or corymbose; perianth six-partite, stellate, deciduous; stamens six, hypogynous. Leaves few, scattered, linear, the upper ones bract-like. Only one species calls for description here.

I. indica (Indian). *fl.* reddish or purplish, few or many; perianth ¼in. to ½in. long; pedicels 1in. to 2in. long. June. *l.* few, the lower ones 6in. to 8in. long. Stem 3in. to 10in. long, flexuous. India, 1818. SYN. *Anguillaria indica.*

IPOMŒA. Including *Leptocallis*, *Mina*, and *Skinneria*. To the species described on pp. 191-2, Vol. II., the following should be added. A few plants formerly included hereunder are now referred to **Argyreia** and **Lettsomia.** *See also* **Batatas** (which is included in this genus by Bentham and Hooker).

I. acuminata (taper-pointed). The correct name of *I. mutabilis.*

I. angustifolia (narrow-leaved). The correct name of *I. filicaulis.*

I. Batatas. The plant known in gardens as *Convolculus chrysorhizus* is a form of this species. 1838.

I. Bona-nox. There is a form *grandiflora*, having very large, sweetly-scented flowers.

I. bonariensis (Buenos Ayres).* *fl.* purplish-lilac; peduncles axillary, solitary, bearing a corymb of three (to seven?) flowers. Summer. *l.* cordate, palmately three- to five-lobed. Stems long-twining, branched, purplish. Roots tuberous. Buenos Ayres, about 1826. A magnificent, stove species. (B. M. 3665.)

I. Bronsoni (Bronson's). This is described (in G. & F. 1892, v., p. 345) as "a rapid grower, with white stems, gouty at base; flowers not seen." Cuba, 1892. Stove.

I. camerunensis (Cameroons). A form of *I. paniculata.*

I. Cavanillesii (Cavanilles'). The correct name of *Batatas Cavanillesii.*

I. coccinea (scarlet).* *fl.* red, sweet-scented; corolla ¾in. to 1¼in. long, the limb obscurely lobed, ¼in. to ¾in. wide. June and July. *l.* on slender petioles, cordate, or with a sagittate or hastate base, acuminate, entire, angled, or toothed. Stems climbing. *h.* 9ft. to 15ft. Carolina, 1713. Half-hardy annual. (A. B. R. 499; B. M. 221.) There is a form *lutcola* with orange flowers.

I. decora (comely). *fl.* white, with a rosy-purple centre, large. *l.* oval, velvety. Stems annual, 3ft. high. Rootstock woody. East Africa, 1879. Stove.

I. digitata (digitate). The correct name of *I. platensis.*

I. filicaulis. The correct name is *I. angustifolia.*

I. gossypioides (Gossypium-like). *fl.* rose-coloured, with a reddish-purple throat, showy. *l.* borne on long petioles. Southern Argentina, 1897. Greenhouse annual; not climbing.

I. grandiflora (large-flowered). A form of *I. Bona-nox.*

I. hederacea. Of this species there are many garden forms, including *atroviolacea* (dark violet and white), *grandiflora* (large, pale blue), *Huberi variegata* (variegated), and *superba* (pale blue, with a white margin).

I. hederifolia (Ivy-leaved).* *fl.* of a very bright reddish-scarlet, numerous, the tube elongated, the limb abruptly spreading. Summer and autumn. *l.* with three to five more or less deep lobes, the middle one ovate-lanceolate, acuminate, the lateral ones much narrower, sinuate-angled. Mexico, Antilles, &c. Stove.

I. Horsfalliæ alba (white). A synonym of *I. Thomsoniana.*

I. imperialis (imperial). Under this name the following half-hardy garden forms are described: *I. i. aurata* (golden), flowers blue or rosy-lilac, leaves golden; a vigorous climber. *I. i. collata* (collated), flowers variable in colour, and having wavy, crimped margins. 1897.

I. Kerberii (Kerber's).* *fl.* of a vivid scarlet, clustered, completely covering the plant (when cultivated in the open air in Southern Italy). *l.* cordate. South America, 1894. Greenhouse.

I. leptophylla (slender-leaved). *fl.* pinkish-purple; corolla funnel-shaped, about 3in. long; peduncles short, one- or two-flowered. *l.* simple, entire, linear, 2in. to 4in. long, ¼in. broad, shortly petiolate, acute. Stems erect or ascending, 2ft. to 4ft. high. Roots very large, weighing from 10lb. to 100lb. Texas and New Mexico. Greenhouse perennial.

I. linifolia (Linum-leaved). *fl.* yellow, small; peduncles 1in. to 3in. long, few- or many-flowered May. *l.* petiolate narrow-oblong, the lower ones often sub-cordate and ovate-oblong, 1¼in. to 2½in. long. Stems slender, twining or creeping. India, 1827. Stove annual. SYN. *Skinneria cæspitosa.*

I. mutabilis. The correct name is *I. acuminata.*

I. paniculata (panicled) The correct name of *Batatas paniculata.*

I. p. camerunensis (Cameroons). A variety with entire leaves. Cameroons, 1891. (R. G. 1891, t. 1352.)

Ipomœa—*continued.*

I. Perringiana (Perring's). *fl.* violet-rose, 3in. long, 2in. across, hypocrateriform. *l.* petiolate, ovate, lobed at base. Stems slender, climbing, clothed with stellate hairs. Cameroons, 1897. Stove.

I. platensis. The correct name is *I. digitata.*

I. purpurea. There are a number of varieties of this species, including *Burridgei* (crimson), *Dicksoni* (blue), *flore-pleno* (double-flowered), and *tricolor* (red, white, and blue striped).

FIG. 463. FLOWERS OF IPOMŒA ROBERTSII.

I. Robertsii (G. F. Roberts').* *fl.*, sepals ¼in. to ½in. long, corolla nearly white externally, with pale pink stripes, 3in. to 4in. long, the limb internally white, obscurely striated with pale pink, and with five lanceolate, rosy-pink rays; peduncles one-flowered. July. *l.* 3in. to 4in. long, membranous, broadly ovate-cordate, acuminate, dull green, pubescent; petioles 1½in. to 2in. long, pubescent. Queensland, 1883. Stove, twining perennial. (B. M. 6952.) See Fig. 463.

I. setifera (bristle-bearing). *fl.* white or purple, scented, showy, borne in profusion, two to four to a petiole; outer sepals bristle-bearing. *l.* cordate-sagittate, emarginate-mucronulate, highly glabrous. Guiana, &c., 1894. Greenhouse perennial.

I. Thomsoniana (Thomson's).* *fl.* white, 3in. in diameter; cymes axillary, few-flowered. *l.* trifoliolate; leaflets stalked, elliptic or elliptic-oblong, acute, fleshy. 1884. A handsome, stove climber, with the general habit of *I. Horsfalliæ.* (F. & P. 1884. p. 118; G. C. n. s., XX., p. 318.) SYN. *I. Horsfalliæ alba.* According to the "Index Kewensis," this is a variety of *I. ternata.*

I. Woodii (Wood's). *fl.* rose-purple, large, disposed in shortly-stalked clusters; corolla campanulate. *l.* cordate, tinted with purple. Zululand, 1894. A tuberous-rooted, greenhouse perennial, with woody stems.

IPSEA (from *ips*, a Cynips insect; in allusion to some fancied resemblance). ORD. *Orchideæ.* A small genus (two species) of stove, terrestrial Orchids, natives of India and Africa; they have the long, narrow, plicate leaves and sheathed scape of *Pachystoma* (under which genus *Ipsea* was included by Bentham and Hooker), but are distinctly pseudo-bulbous, with a few large, highly-coloured flowers.

I. speciosa (showy). This is the correct name of *Pachystoma speciosum.*

IRESINE. SYN. *Xerandra.* Including *Rosea.* To the species described on p. 193, Vol. II., the following should be added:

I. formosa (beautiful).* *l.* golden, veined with crimson and pencilled with green. 1883. A very effective sport from *I. Lindenii*; it keeps its character well out of doors, and makes an excellent bedding plant.

I. Herbstii Wallisii (Wallis's).* *l.* small, ovate-reniform, cleft at apex, recurved, blackish-purple. A remarkable, dwarf variety. Another good form is *brilliantissima.*

IRIARTEA. To the species described on p. 193, Vol. II., the following should be added:

I. andicola (Andes). A synonym of *Ceroxylon andicola.*

I. gigantea (gigantic).* *l.* having large, obliquely fan-shaped leaflets, præmorsely cut, light green; lowermost leaves gracefully recurved. Stem supported a few inches above the soil by thick roots. Habitat not recorded. A noble Palm. (G. C., Aug. 17, 1872, p. 1105, f. 261.)

I. ventricosa (swollen). *fl.*, spathes ten to twelve, deciduous; spadices 3ft. to 4ft. long. *fr.* globose, the size of a Cherry. *l.* 8ft. to 12ft. long; pinnæ repand-sinuate. Stem attaining 80ft. in height; but sub-globose when young. Rio Negro, Brazil. (I. H., t. 400.)

I. Bungerothii is in cultivation at Kew.

IRIDORCHIS. A synonym of **Cymbidium** (which *see*).

IRIS. Rainbow Flower. Including *Neubeckia.* According to J. G. Baker's "Handbook to the *Irideæ*," this genus embraces upwards of 160 species. One or two formerly included here are now referred to **Marica**, **Moræa**, and **Trimezia.**

In the outdoor garden there are few genera which are richer in species and varieties than the *Iris*, as there are few months of the year when one or other of its representatives is not in evidence. Even in winter the lovely *I. unguicularis* (*I. stylosa*), *I. reticulata histrioides*, *I. alata*, *I. Vartani*, and *I. persica* may be enjoyed if they are planted in a sheltered sunny spot, or better still upon the rockery. Of early spring-flowering, bulbous kinds there are a still greater number, rich in colour and fragrant as to flower—*I. reticulata*, *I. Rosenbachiana*, and the lesser-known *I. Bakeriana.* There are many others, but those named are gems of the first water in their respective sections. They are, moreover, species which should receive far more encouragement from gardeners than is usually given them.

In late spring there are several species quite as charming in their way as the three named, the best being *I. sindjarensis*, *I. assyriaca*, *I. susiana*, *I. iberica*, *I. Helenæ*, *I. Gatesii*, *I. atrofusca*, *I. lupina* (with its curious beard), and *I. Lortetii.* A little later, in May, the delicately beautiful *I. cristata*, so well fitted for either rockery or border, is in flower. This last is one of the species that cannot be too freely planted where a sandy peat soil can be given it. May, however, is *the* month of Irises, as June is of Roses; then the lovely Rhizomatous section generally, from the common blue *germanica* to the finer descendants of *pallida*, *neglecta*, *squalens*, *variegata*, &c., are in full beauty. Nor is June without its special Iris, for then the flat, Clematis-like flowers of *I. lævigata* (better known as *I. Kæmpferi*) commence to blossom, and continue right into late summer; while contemporary with them are many little known but lovely species in *I. Boissieri*, *I. tingitana*, and *I. juncea*, the familiar but charming *I. sibirica*, and the English and Spanish Irises in great variety.

Coming, as the Irises do, from many quarters of the globe, their treatment varies considerably, not only with species and varieties from the same countries, but often with individuals. Some, like the common Flag Irises, will flourish with a minimum of attention in almost any soil, providing it is fairly rich, and even in town gardens. Many, as already pointed out, require a sheltered sunny rockery; a few, like *I. Lortetii*, *I. susiana*, *I. tectorum*, *I. lupina*, &c., require a position where they can literally have a "roasting" in summer, and a light, well-drained soil. Those growers who are most successful with this singularly beautiful section advocate lifting the roots a month after flowering and placing them on a sunny shelf until planting-time again arrives in December. *I. tectorum*, as its name implies, grows upon roofs in its native country, but here a less elevated position will suffice if it be on a rockery with plenty of sun, and protected from cutting winds.

Iris—*continued.*

The Bearded Irises as a whole delight in a fairly dry soil like a sandy loam, and the best results are attained by not too frequent disturbance. The crowns may be broken up every third year, and the most vigorous portions planted. This should be done as soon after flowering as convenient.

For waterside planting there are a host of species and varieties available, and these should be freely employed.

FIG. 464. IRIS SIBIRICA.

Iris sibirica (Fig. 464) and its many varieties are a host in themselves. They should be planted a little above the water-level, when a fine effect will be obtained. They are also good border plants. The common Water Flag (*I. Pseudo-Acorus*) and its variegated form are by no means to be despised, as they flourish in marshy spots where little else of the same bold and floriferous character is to be found. Equally as well adapted for the border and the waterside are the robust, soft-coloured hybrids known as Monspur, for which gardeners are indebted to Professor Foster. Then there are the Japanese Irises (*I. lævigata*), which are similarly accommodating so long as when located in the border they are assigned a moist position. To see them, however, in their greatest beauty they should be grown near the water in company with the semi-aquatic kinds already named, *I. versicolor*, and the newer *I. Delavayi*.

Of the Bulbous Irises the English (Fig. 465) and the Spanish are amongst the most popular, for they yield gorgeous colour effects at a minimum of cost. Whole beds are sometimes devoted to them, as in Fig. 466; but the painter alone can give any idea of their brightness and beauty—a beauty which is longer continued if the beds are not exposed to full sun. One frequently hears that Irises are too ephemeral to be used for decorative effect indoors. This charge would not lie if the cultivator

Iris—*continued.*

would cut them as buds and allow them to expand in water. Taken generally, their planting is best effected from late summer to autumn, and the bulbs should not be too frequently disturbed. For pot culture many of the Bulbous Irises are amongst the brightest flowers under glass. They should be potted up in autumn and afterwards placed in a cold frame. All Bulbous Irises when grown outside should have a sandy but fairly rich soil. No protection in such a soil is necessary in winter, although a little light litter strewn over their quarters during severe weather will ensure them against bad frosts.

Irises have comparatively few pests. Slugs are troublesome to the early-flowering kinds, and should be trapped. The worst pest is, however, a species of fungus found upon *I. reticulata*, and known as *Mystrosporium adnatum*. It is characterised by inky-black patches upon the bulbs, which gradually rot away, leaving but an empty shell containing a blackish powder. According to Mr. Massee, who stands sponsor for the name, "soaking the

FIG. 465. VARIETIES OF ENGLISH IRISES.

bulbs for two hours in a solution of formalin one part, and water 300 parts, will destroy the fungus in light attacks." All infested bulbs which are beyond treatment should be burned. The fungus is very common, and terribly destructive.

To the species, &c., described on pp. 194-200, Vol. II., the following should be added:

Sect. I. Irises proper.

Rootstock a Short Thick Rhizome.

I. Agatha.* A hybrid, with pale lilac flowers, netted with purple, and with silver-grey falls. It is between *I. iberica* var. and *I. Kowlkowi venosa*.

I. Alberti (Dr. Albert Regel's).* *fl.* bright lilac; tube less than 1in. long; falls obovate-cuneate, 2in. long, densely bearded, and

Iris—*continued.*

veined dull brown and lilac on a white ground; standards above 1in. broad, suddenly narrowed to a convolute claw; panicle lax, overtopping the leaves. May. *l.* ensiform, 1½ft. to 2ft. long, slightly glaucescent. Rootstock stout. Turkestan. (B. M. 7020; R. G. 999.)

I. albicans (whitish). A form of *I. florentina.*

I. albopurpurea (white and purple). *fl.* white, spotted with purple. Japan, 1896. This species is closely allied to *I. hexagona* and *I. lævigata.* It was imported with the latter, from which it differs in having the inner perianth segments erect instead of horizontally spreading. (B. M. 7511.)

I. aphylla. Of the numerous garden varieties of this well-known species, the following are good: BRIDESMAID, soft lavender, margined with mauve; DELICATISSIMA, white, margined with blue; and MADAME CHEREAU, white, margined with pale blue.

I. arenaria minor (lesser). A dwarf variety, having much smaller flowers than those of the type.

I. asiatica (Asiatic). A form of *I. pallida.*

Iris—*continued.*

I. Barnumæ (Mrs. Barnum's). *fl.*, tube greenish, ¼in. long; limb dark uniform claret-purple; falls 2in. long, oblong-cuneate, with a soft, whitish beard down the haft; standards erect, 2½in. long, plain purplish-black; spathe one-flowered, 2in. to 2½in. long, the valves tinged with purple. *l.* weak, glaucous, 6in. long at flowering time, ¼in. to ½in. broad. Stem one-headed, 1in. to 6in. long, with a single leaf. Mountains of Armenia, 1888. (B. M. 7050.)

I. Bartoni (Col. Barton's). *fl.* two or three in a cluster, strongly scented; perianth tube greenish, 1in. long; falls creamy-white, veined greenish-yellow on the face, violet-purple on the claw, the beard white and orange; standards creamy-white, veined purple. June. *l.* ensiform, pale green, 1½ft. long, 1½in. to 2in. broad, strongly ribbed. Stem usually once-forked, overtopping the leaves. Afghanistan, 1886. (B. M. 6869.)

I. benacensis (Lake Garda). *fl.*, falls dark violet, with an obovate blade or haft veined with brownish-violet, and a yellowish-white beard; standards bright violet, oblong-unguiculate. *l.* ensiform, about 1ft. long. Stem about 1ft. long, three-headed. South Tyrol, 1887.

FIG. 466. A BED OF SPANISH IRIS.

I. Athoa (Mount Athoa). *fl.* of a brownish-red-purple. Mount Athoa, 1893. A more robust species than *I. biflora*, to which it is closely related.

I. atrofusca (dark fuscous). A form of *I. atropurpurea.*

I. atropurpurea (dark purple). *fl.*, tube green; limb purplish-black; falls oblong-cuneate, 2in. long, 1½in. broad; standards erect, 3in. long, orbicular-unguiculate; spathe one-flowered. *l.* linear, glaucous, 6in. long. Syria, 1889. (I. H. 1889, 51; R. G. 1361.)

I. a. atrofusca (dark fuscous). A distinct variety, as tall as *I. susiana*, but having the outer perianth segments much shorter and of a uniform brownish-black. Palestine, 1893. (B. M. 7379.)

I. atroviolacea (dark violet). *fl.* dark violet, very fragrant; tube less than 1in. long; falls 3in. long, obovate-cuneate, reflexed half-way down; beard white, tipped with yellow; standards as long as the falls, 2in. broad. May. *l.* ensiform, 1ft. long at flowering time, ¾in. to 1in. broad. Stem one-headed. Only known in cultivation; probably a hybrid between *I. Chamæiris* and *I. pallida.*

I. aurea intermedia (intermediate). A deep yellow variety having narrow standards. Intermediate between *I. aurea* and *I. orientalis.*

I. balkana is a distinct species, flowering in April and May.

I. Biliotti (Biliotti's). *fl.* sweet-scented; falls reddish-purple, with fine, blackish veins, bearded, 3½in. long, 1½in. broad, cuneate-spathulate; standards bluish-purple, with fine blue veins, 3½in. long, 2in. broad, connivent; styles white, ovate, with triangular, reddish-purple crests. June. *l.* darker green, more distinctly striated, and more rigid than in *I. germanica.* Trebizond, 1887. Habit as *I. germanica.*

I. Bismarckiana (Bismarck's). *fl.* as large as in *I. susiana*; falls ash-grey, with darker veins and a dark spot at base, orbicular; standards sky-blue, with blackish veins. *l.* ensiform, glaucous-green, 8in. long. Lebanon, 1890. Habit as *I. susiana.*

I. bosniaca (Bosnian). *fl.* citron-yellow, bearded, like *I. pumila.* Early spring. *h.* 1ft. to 1½ft. Bosnia, 1898.

I. bracteata (bracteate). *fl.*, tube nearly obsolete; limb pale yellow, 2in. long; falls veined with blue, having an ovate blade ½in. broad; standards shorter, oblanceolate; spathes two-flowered; peduncle one-headed, 2in. to 12in. long. *l.*, produced ones very few to a tuft, 1ft. to 2ft. long, ½in. to ¾in. broad. Oregon, 1888. (Gn. 1888, t. 8.)

I. caroliniana (Carolina). This is closely allied to *I. versicolor*, mainly differing in its erect, glaucous, much shorter leaves, and very much smaller seeds, arranged in two distinct rows. North Carolina, 1888. (G. & F. 1893, vi., p. 334, f. 51.)

Iris—*continued.*

I. Chamæiris italica.* A fine purple variety of dwarf habit.

I. ciengialti (Monte Ciengialto). *fl.* sky-blue, flushed violet; perianth tube, as well as the segments, short and broad, the beard white, tipped orange, short and dense, with thick, stunted hairs; scape about 1ft. high, usually four-flowered. May and June. *l.* yellowish-green, 6in. to 9in. long and ¼in. broad, or more. Stem about as long as the leaves, one- to three-headed. Monte Ciengialto. There are several varieties of this plant, including *Loppio*, with rich dark blue flowers.

I. cypriana (Cyprian). *fl.* bright lilac, fragrant, 6in. to 7in. in diameter; tube rather longer and segments more obovate than in *I. pallida* (to which this species is allied). Late June. *l.* glaucous, ensiform. Cyprus, 1888.

I. deflexa (deflexed). *fl.* fragrant; tube 1in. long; limb 2in. to 3in. long; falls dark purple, obovate-cuneate, reflexing half-way down; standards bright lilac, obovate-unguiculate; spathes two- or three-flowered. June. *l.* ensiform, glaucous, 1ft. to 1½ft. long, 1in. to 1½in. broad. Stem three- to five-headed, overtopping the leaves. Temperate Himalayas, 1833. SYN. *I. nepalensis*, of Wallich (B. R. 818).

FIG. 467. IRIS GERMANICA BLACK PRINCE.

I. Delavayi (Delavay's).* *fl.* of a beautiful violet, blotched with white; falls ovate-lanceolate, acute; standards reflexed, ovate, obtuse, emarginate. *l.* glaucous, 2½ft. long. Yunnan, China, 1895. A tall-growing, semi-aquatic species, nearly allied to *I. sibirica*. (B. M. 7661; R. H. 1895, p. 393, f. 128-9.)

I. Duthieii (Duthie's). *fl.* solitary, sessile; tube 3in. long or more; falls reddish-lilac with darker veins and blotches above, greenish-yellow beneath, nearly horizontal, lanceolate, bearded; standards paler reddish-lilac, with darker veins, connivent, 1½in. long, oblong-ovate; styles light reddish-lilac, with triangular, crenate crests. *l.* appearing after the flowers, five or six to a tuft, 2ft. long, ½in. broad, yellowish-green. Rhizome knotted. Kumaon, 1887.

I. ensata chinensis (Chinese). *fl.*, falls pale blue, the central part yellowish, veined with white; standards lilac, erect. (R. G. 1011.)

I. Eulefeldi (Eulefeld's). A variety of *I. scariosa*.

I. fimbriata (fringed). A synonym of *I. japonica*.

I. flavissima Bloudovii (Bloudow's bright yellow). The correct name of *I. Bloudovii*.

Iris—*continued.*

I. florentina albicans (whitish). *fl.* pure white, very fragrant; perianth tube and spathe valves shorter than in the type. Spain to Cyprus, 1888.

I. furcata (forked). A synonym of *I. aphylla*.

I. Gatesii (Rev. T. F. Gates').* *fl.*, falls reflexed, 3in. broad, of a delicate pale grey, formed by fine purple veins on a creamy-white ground, sometimes sky-blue with darker veins; throat densely hairy. June. *l.* (and habit) as in *I. susiana*. Armenia, 1889. (G. C. 1890, ii., 17; Gn. 1893, i., 897.) A robust species.

I. germanica. There are many improved varieties of this, the Common Blue Flag: BLACK PRINCE, deep purple (Fig. 467); FONTARABIA, deep blue; KHARPUT, deep blue and violet-purple; KOCHII, violet, white, and yellow; NEPALENSE, dark purple and violet, with red, yellow, and white stripes; and PURPLE KING.

I. g. gypsea (chalky). *fl.* pale pearly-white. 1893. (I. H. 1893, t. 182.)

I. g. semperflorens (ever-flowering). A variety raised in Italy, and described as "being constantly in flower and well adapted for forcing and pot culture." 1890.

I. g. Siwas (Siwas). *fl.*, falls dark indigo-purple; standards dark bluish-purple. Siwas, Asia Minor, 1887.

I. Grant-Duffi (Sir M. E. Grant-Duff's). *fl.*, tube ¼in. long; limb 2½in. long; falls with a yellow blade ½in. long, the haft yellowish-white veined with lilac; standards as long, similarly coloured, oblanceolate-unguiculate; spathes one-flowered. *l.* linear, less than 1ft. long, ½in. broad. Stem 6in. long, one-headed, about two-leaved. Palestine, 1888. (B. M. 7604.)

I. Guldenstädtiana. Of this species there are white, blue, and soft yellow forms—*alba*, *cærulea*, and *lutescens*.

I. Haynei (W. A. Hayne's). *fl.* dark grey, dotted with black; tube 1in. long; blade of the falls orbicular, 1½in. broad; standards 3in. long, orbicular, with a short claw; spathe one-flowered. *l.* weak, 6in. to 9in. long at flowering time, ¼in. to ½in. broad. Stem one-headed, 6in. to 8in. long. Palestine, 1893. Perhaps not distinct from *I. Sari*.

I. Helenæ (Helen's).* *fl.*, tube greenish, 1½in. long; limb pale lilac, veined with reddish-brown, 2in. to 2½in. long; falls dark purple and velvety at the throat, 1in. broad; spathes 2in. to 3in. long, one-flowered; peduncle one-headed, 3in. to 6in. long, with two to four short leaves. *l.* linear-complicate, very falcate, 3in. to 4in. long at flowering time. Palestine, 1894. (J. H. 1894, p. 227, f. 38.) SYN. *I. Mariæ*. A very beautiful species.

I. Hookeri (Hooker's). The correct name of *I. tridentata* (of Hooker). SYN. *I. tripetala* (of B. M.). *I. Hookeri* and *I. Hookeriana* are distinct species.

I. Hookeriana (Hooker's). *fl.* two to a stem; tube ½in. to ¾in. long; falls bluish-purple with darker blotches above, green with purple borders beneath, obovate-lanceolate, 1⅞in. long, ⅝in. broad, reflexed, densely bearded; standards bluish-purple, narrow-obovate, ⅝in. long, ¼in. broad; styles reddish-purple, very concave, with triangular, serrated, revolute crests. *l.* 1ft. long, ⅝in. to 1in. broad, appearing with the flowers. Stem about 5in. long. Lahul, 1887. (B. M. 7246.)

I. hybrida (*I. amœna*). Some good garden varieties are: ALICE BARR, white, with soft lavender shadings; DUC DE NEMOURS, purple, edged with white; MRS. H. DARWIN, white, with violet nettings; MRS. G. DARWIN, white, with gold and violet reticulations; and VICTORINE, white, netted blue, with deep blue falls having white mottlings.

I. iberica paradoxoides (*I. paradoxa*-like). *fl.* having a broad, purple beard on the spreading, yellow falls; standards purple, with darker veinings. 1890.

I. Ibparad.* A lovely hybrid between *I. iberica* and *I. paradoxa*. The flowers are vinous purple, veined with a darker colour and striped with red.

I. imbricata (imbricated). A synonym of *I. flavescens*.

I. kashmiriana (Kashmir). *fl.* sweetly scented; tube over 1in. long; limb pure white, 3in. long; standards and falls 1½in. to 1½in. broad, the beard white, tipped with yellow, 1½in. long; falls reflexing half-way down; spathes 3in. long, two- or three-flowered. May. *l.* ensiform, slightly glaucous, 1½ft. long, more than 1in. broad. Stem 3ft. long, bearing several clusters of flowers. Kashmir, 1875.

I. Kingiana (King's). A synonym of *I. kumaonensis*.

I. Kochii (Koch's). *fl.* dark violet; falls having an obovate blade, a haft veined with brown, and a yellow beard; standards obovate-unguiculate. *l.* entire, somewhat glaucescent. Stems 1ft. to 1½ft. long (about as long as the leaves), three- to four-headed. Southern Tyrol, 1887.

I. Korolkowi. Of this species there are a number of colour varieties, including *Leichtliniana*, *venosa*, and *violacea*, but the following is the most remarkable:

I. K. concolor (concolorous).* A fine variety, with almost concolorous, bright lilac-purple flowers. (B. M. 7025B.)

I. kumaonensis (Kumaon). *fl.*, perianth tube greenish, cylindrical, 2in. to 2½in. long; falls dark lilac, mottled paler

Iris—*continued.*

lilac, obovate-cuneate, with a white and yellow beard; standards paler lilac, unguiculate, erect; spathes single-flowered; peduncle very short. May. *l.* five or six in a rosette, three of them elongated, linear, erect, about 6in. long at flowering time. Central Himalayas, 1837. SYN. *I. Kingiana* (B. M. 6957).

I. lævigata. The Japanese Irises of garden origin are improvements upon the type, and should be grown in as great a variety as possible. The following are all good: CHIYO, lilac and white, with golden centre; DOROTHY DREW, lilac, with violet veinings and yellow centre; LADY SCOTT MONCRIEFF, white and rose-pink; MAJOR SHIBO, mauve, with yellow blotch; OKUBO, white, speckled rosy-lilac; OZAKA, pale blue, blotched deep yellow; QUEEN OF SPANGLES, pinkish-purple, with white mottlings and yellow centre; and TOMOZE, white, light blue ring, and spotted gold.

I. l. Schirnhoferi (Schirnhofer's). A yellow-flowered form. 1883.

I. Leichtlini (Leichtlin's). *fl.* yellowish, purple, and fuscous-red; standards broadly lanceolate, acute, erect; falls obovate-spathulate, with a bluish-white beard; spathe herbaceous, four-leaved, purplish at apex; scape three-flowered. *l.* ligulate-ensiform, acute, erect, slender, 1ft. to 1½ft. long. Stem 1½ft. long, one-headed. Rhizome stoloniferous. Turkestan, 1887. SYN. *I. vaga* (R. G. 1244, f. 7).

I. lineata (lined). A synonym of *I. Suwarowi.*

I. Lortetii (Lortet's).* *fl.*, tube 1½in. long; limb 4in. long; falls pale greyish-lilac, spotted and striped with reddish-brown, and with short yellow hairs down the haft, 3in. broad; standards pale grey, veined with reddish-brown, erect-inflexed; spathes 1in. to 6in. long, one-flowered; peduncle short, one-headed. *l.* thin, glaucous, ensiform, less than 1ft. long at flowering time. Lebanon, 1890. (B. M. 7251; Gn. 1893, ii., 897.) One of the best species.

I. L. alba (white). A variety with pure white flowers. 1896. Half-hardy.

I. lupina (wolf-bearded). *fl.* solitary; tube about 2in. long; falls greenish-yellow, veined brownish-red towards the margins, 3in. long, 1¾in. broad, broadly lanceolate, reflexed, serrated, bearded; standards the same colours, 3¾in. long, 2½in. broad, elliptic, connivent, crenate, heavily bearded; styles yellow, with brownish-red veins and dots, much recurved, with rounded crests. *l.* 9in. long or more, ½in. broad. Stem 6in. high. Kharput, 1887. A curious species.

I. lutescens Statellæ (Marquis Statella's). *fl.*, perianth segments broader than in the type; spathe valves shorter, less pointed, and more scariose. 1886. (B. M. 6894, under name of *I. Statellæ.*)

I. macrosiphon (large-tubed). *fl.*, tube slender, 1½in. to 3in. long; limb bright lilac, 2in. long; falls ¾in. broad, obovate-cuneate; standards rather shorter; spathes one- or two-flowered. *l.* linear, 1ft. long, finely-ribbed. Stem one-headed, 3in. to 6in. long. California and Oregon, 1890. (Gn. 1890, xxxviii., 462.)

I. Madonna (Madonna). This is stated to be "an evergreen species, with large, lilac-blue flowers." Arabia, 1892.

I. Mariæ (Maria's). A synonym of *I. Helenæ.*

I. Meda (Medean). *fl.*, tube green, less than 1in. long; falls greenish-yellow with a brown centre, copious brown veins, and a dense yellow beard; standards unguiculate; spathe one-flowered, 2in. to 2½in. long. *l.* glaucous, not rigid, 4in. to 5in. long at flowering time, ½in. broad. Persia, 1888. (B. M. 7040.)

I. Milesii (Miles'). *fl.* bright lilac, fugitive, inodorous, three or four in a cluster; perianth tube cylindrical, the limb about 2in. long; falls having darker lilac lines radiating from the yellow keel; standards shorter than the falls. May and June. *l.* seven or eight, distichous, ensiform, pale green, 1½ft. to 2ft. long, 1½in. broad, gradually tapering. Stem 3ft. long, bearing three or four clusters of flowers. Temperate Himalayas, 1831. (B. M. 6839.)

I. Monspur.* Of this lovely hybrid there are many forms, all some shade of blue. A. J. BALFOUR, DOROTHY FOSTER, LORD WOLSELEY, and PREMIER are all good.

I. neglecta. Very numerous are the varieties of this species, such as CLARISSIMA, lavender, netted crimson-purple on white; CORDELIA, pinkish-lilac, deep crimson, edged rose; KITTY KINGSBURY, lavender and deep purple; SULTANA, blue and maroon, netted white, and with an orange crest; and WILLIE BARR, French grey and white, suffused violet.

I. nepalensis. The plant figured in B. R. 818 as *I. nepalensis* is *I. deflexa.*

I. n. Letha (Letha). This form differs from the type in having sessile and very fragrant flowers. Birma, 1892.

I. pallida. The beautiful colour combinations and fragrance of the garden forms of this make them great favourites wherever Rhizomatous Irises are grown. Some of the most noteworthy kinds are: ALBERT VICTOR, pale blue and lavender; ASIATICA, pale purplish-blue; DALMATICA, lavender-blue; DALMATICA PRINCESS BEATRICE, lavender, very large flowers; LEONIDAS, soft mauve; and QUEEN OF MAY, rosy-lilac.

I. p. asiatica (Asiatic). *fl.*, standards greyish-blue; falls rich bluish-purple and yellow; veins brown. Asia Minor, 1892. (Gn. 1892, xli., p. 121, under name of *I. asiatica.*)

Iris—*continued.*

I. paradoxa (paradoxical). *fl.*, tube less than 1in. long; falls dark brown, lingulate, 1in. to 1½in. long, with a small blade ½in. broad and a diffusely-bearded claw; standards white, erect, 2in. to 3in. long, 1½in. to 2in. broad, with a short claw; spathe one-flowered, 2in. to 3in. long. *l.* linear-complicate, 3in. to 6in. long at flowering time, ¼in. broad, very falcate. Stem one-headed, 2in. to 6in. long. Georgia and North Persia, 1888. (B. M. 7081; R. G., t. 386, f. 3.)

I. p. violacea (violet). *fl.* having the standards dark violet and the falls tinged with violet.

I. Polakii (Polak's). *fl.*, tube ½in. long; falls obovate-cuneate, 2in. long, 1in. broad, deflexed from below the middle, with a dark violet beard and a dark violet spot above it; standards rather shorter, lilac, veined with violet; stem one-headed, 3in. to 4in. long. *l.* narrow-linear, as long as the stem. Rhizome very short. Persia (at 8000-9000ft.).

I. pratensis (meadow-loving). A synonym of *I. sibirica.*

I. pseudo-variegata (false variegated). *fl.*, falls brown, with yellow veins; standards bright deep yellow. 1899. This belongs to the *I. germanica* section.

I. Robinsoniana (Robinson's). A synonym of *Moræa Robinsoniana.*

I. Sari (Sar River). *fl.*, tube 1in. long; limb bright lilac, 3in. long; falls obovate-cuneate, 1½in. to 2in. broad, reflexed half-way, with a diffused beard down the haft; standards broader and a little longer, orbicular, with a short claw; spathe one-flowered, 2in. to 3in. long. *l.* pale, linear-complicate, about 6in. long at flowering time, ½in. to ¾in. broad. Stem one-headed, 3in. to 6in. long, with about two reduced leaves. Asia Minor, 1876.

I. S. lurida (lurid). *fl.*, falls pale brownish, with copious brownish-black spots and lines. 1887. (B. M. 6960.)

I. S. nazarene (Nazarene). *fl.*, falls straw-coloured, heavily marked with rows of brownish-purple spots, and with a large maroon blotch in the centre; standards creamy-white, with blue veins. Palestine, 1893.

I. scariosa (scarious). *fl.*, tube greenish, 1½in. to 2in. long; limb yellow or lilac, 2in. long; falls ¾in. to ⅞in. broad, reflexing half-way down; standards the same size; spathes two- to three-flowered; peduncle one-headed, 2in. to 6in. long. May. *l.* ensiform, 6in. to 12in. long at flowering time, ½in. to ⅞in. broad. Siberia, &c., 1826.

I. s. Eulcfeldi (Eulefeld's). *fl.* lilac, larger than in the type. *l.* broader. Stem about 1ft. long. (B. M. 6902; R. G. 954.)

I. sibirica acuta (acute). A variety with white reticulations.

I. s. alba (white). A white-flowered variety.

I. s. orientalis (oriental). A deep velvety-blue.

Of garden forms that may be recommended are: ATRO-PURPUREA, purple; BAXTERI, blue, with white falls; GEORGE WALLACE, pale blue and deep blue in combination, flaked with white; and GRANDIS, violet, with white nettings.

I. sofarana. *fl.* solitary; falls creamy-white, with dark purple reticulations, elliptic; standards orbicular, nearly white, marked with thin dark purple veins interspersed all over with purple dots; scapes about 10in. high. Lebanon, 1899. (G. C. 1899, xxvi., pp. 389, 391, f. 125.)

I. squalens. Of this species a host of garden forms have been raised, many of them of great merit: A. F. BARRON, dark bronze, white, with crimson tip; ARNOLS, reddish-bronze and dark purple; BRONZE BEAUTY, yellow, reddish-lavender, crested with gold; DR. BERNICE, coppery-bronze; LAVENDULACEA, lavender, tinged light yellow; M. CHEREAU, golden-bronze and deep crimson; SALAR JUNG, bronze, with deep maroon nettings on a white ground; and VAN GEERTII, lavender and deep purple.

I. Statellæ (Marquis Statella's). A form of *I. lutescens.*

I. Straussii (Strauss's). *fl.* of a brownish-violet tint. *l.* narrow. *h.* about 3in. Sultanabad, Persia, 1899.

I. Suwarowi (Suwarow's). *fl.* hyaline-greenish, with claret-purple veins; segments all elliptic-lanceolate, cuspidate; claw of the standards sometimes faintly bearded; falls bearded to the middle with blue. *l.* thin, linear, pale green, about 1ft. long at flowering time, ¼in. broad. Stem one-headed, as long as the leaves. Turkestan, 1885. (B. M. 7029.) SYN. *I. lineata* (R. G. 1244, f. 1-6).

I. tenuis (slender). *fl.*, tube very short; limb white, faintly veined with yellow and lilac, 1½in. long; blade of falls oblong, ½in. broad; inner segments rather shorter, oblanceolate-unguiculate; spathes one-flowered. *l.*, produced ones few in a tuft, ensiform, 1ft. to 1½ft. long, ½in. broad, gradually narrowed to the point. Stem 1ft. long, forked, two-headed. Oregon, 1883. (G. & F. 1883, i., f. 6; Gn. 1883, t. 1.)

I. tridentata. The correct name is *I. Hookeri.*

I. tridentata (three-toothed), of Pursh. A synonym of *I. tripetala.*

I. tripetala (three-petaled). *fl.*, tube less than 1in. long; limb bright lilac, 2½in. to 3in. long; blade of the falls 1in.

1.—Iris juncea (Bulbous Section).
2.—Iris variegata "Honorable" (Tall Bearded Flag Iris).
4.—Iris Monspur (Tall Beardless Flag Iris).
3.—Iris Kæmpferi, White (The Japanese Flag Iris).

Iris—*continued.*

or more across; standards cuspidate, erect, ¼in. long; spathe one-flowered, the outer much shorter than the inner. *l.* linear, 1ft. to 1½ft. long, ¼in. broad, finely ribbed. Stem 1½ft. to 3ft. long, one- to three-headed. Southern United States. SYN. *I. tridentata*, of Pursh (S. B. F. G., t. 274).

I. tripetala (of B. M.). A synonym of *I. Hookeri*.

I. trojana (Trojan). *fl.* sweet-scented; tube longer than the ovary; limb bright violet-purple; falls violet, obovate, the blade longer than the haft, which is white bordered with yellow and veined with reddish-brown; standards bright violet, suddenly unguiculate. *l.* ensiform, very acute, glaucescent. Stem above 3ft. long, with many branches, much overtopping the leaves. Troy, 1883.

I. tuberosa. This is now accorded generic rank. *See* **Hermodactylus.**

I. unguicularis alba (white). This variety differs from the type in having pearly-white flowers. 1883.

I. u. grandiflora (large-flowered).* *fl.* deep purple, very large. 1899.

I. u. lilacina (lilac). *fl.* of a tender lilac, smaller than in the type, with less pronounced yellow spots; crests of the stigma very upright. Atlas, 1888.

I. u. marginata (margined). *fl.* violet, edged with white. 1883.

I. u. pavonia (peacock-like). *fl.* having "a white, radiating area at base." 1883.

I. u. speciosa (showy). *fl.* brightly coloured, larger than in the type; falls violet, the basal part whitish veined with violet-purple; standards brownish-purple. Said to be only adapted for pot culture.

I. vaga (wandering). A synonym of *I. Leichtlini*.

I. Van Houttei (Van Houtte's).* *fl.* marked with reticulate veins of a dark brown or black. April. 1882. A handsome and distinct hybrid between *I. susiana* and *I. iberica*, having more resemblance to the former in the markings.

I. variegata. This species is rich in garden varieties, all of which have the standards same shade of yellow, the falls often differing considerably. Varieties to note are: AROU HASSAN, coppery-yellow, with darker mottlings; DARIUS, lilac, edged white, orange head; ED. SIMMONS, yellow, with purple blotches and deep purple falls; GRACCHUS, crimson, white nettings; HUMBOLDTII, yellow, with purplish-black tracings and edged with gold; MAORI KING, yellow and deep crimson, edged with gold; ROBERT BURNS, velvety-maroon, netted with white and edged with gold.

I. versicolor virginica. The correct name of *I. virginica*.

Sect. II. Xiphions.

Rootstock Bulbous.

I. Aitchisoni (Aitchison's). *fl.*, tube 1in. to 1¼in. long; limb bright lilac, 1½in. to 2in. long; falls with an obovate blade ½in. broad; standards spreading, tricuspidate, less than 1in. long; spathes one-flowered, 2in. to 2½in. long. March. *l.* linear, sub-terete, 1ft. to 1½ft. long at flowering time. Stem 6in. to 18in. long, one- to three-headed. Punjab and Afghanistan, 1893. (Gn. 1893, liv., p. 102, t. 1182.)

I. alata. There are a number of garden varieties of this species, including *alba* (white), *cinerea* (greyish), *cupreata* (coppery), *lilacina* (lilac), *magna* (large), *nigrescens* (blackish), and *speciosa* (showy). Several of them are figured in R. G. 1351.

I. argentea (silvery). A form of *I. xiphioides*.

I. assyriaca (Assyrian).* *fl.* white, much resembling those of a large *I. caucasica* in form. 1896.

I. Bakeriana (Baker's). *fl.* solitary, violet-scented; tube and limb each 3in. long; falls bright violet on the edges, white in the centre with violet spots, and having an inconspicuous yellow streak down the claw; standards plain lilac, erect, oblanceolate. February. *l.* three or four, subulate, hollow, 6in. to 9in. long at flowering time, with a horny tip. Mountains of Armenia, 1889. (B. M. 7084.)

I. Boissieri (Boissier's). *fl.* blue-purple and red-purple. May. South Portugal, 1876. This is closely allied to *I. filifolia*, "but differs in having a very distinct tube above the ovary, in having broader and more obovate inner perianth segments, in the claw of the outer perianth segment being long and narrow, and furnished with a very distinct beard which stretches far on into the lamina" (M. Foster).

I. Bornmulleri (Bornmuller's). A synonym of *I. Danfordiæ*.

I. caucasica cœrulea (blue). *fl.* pale lilac, lined with violet, and having a yellow patch on the falls. 1889.

I. c. oculata (eyed). *fl.* yellow with blue markings. 1889.

I. Danfordiæ (Mrs. Danford's).* *fl.*, tube 1½in. long; limb bright yellow, 1½in. long; falls spotted with brown, the blade ½in. broad; standards reduced to a spreading cusp; spathes 2in. long. February and March. *l.* produced after the flowers, hollow, tetragonal, 1ft. long. Stem very short, one-headed.

Iris—*continued.*

Cilician Taurus, 1889. (B. M. 7140.) SYN. *I. Bornmulleri* (Gn. 1890, i., 753, 2).

I. Fosteriana (Foster's). *fl.*, falls pale yellow, 1½in. to 2in. long, with an orbicular blade above ½in. broad; standards bright purple, 1in. long, with an obovate blade; spathes one-flowered. March. *l.* four to six, lanceolate, acuminate, falcate, 4in. to 6in. long at flowering time. Stem short, one- or two-headed. Afghan and Russian boundary. (B. M. 7215.)

I. juncea numidica (Numidian). *fl.* light yellow, having the falls veined with black. 1889. A handsome variety, "unlike any other Iris."

I. Kolpakowskiana (Kolpakowski's). *fl.* violet-scented, solitary; tube 2in. long; limb bright lilac, 1½in. to 2in. long; blade of the falls ½in. broad, with a yellow line at the throat, much shorter than the haft; standards oblanceolate-unguiculate. *l.* four to six, linear, sub-terete, channelled and white-striped, 2in. to 3in. long at flowering time. Mountains of Turkestan, 1888. (R. G. 939.) SYN. *Xiphion Kolpakowskianum* (B. M. 6489).

I. lusitanica (Portuguese). A form of *I. Xiphium*.

I. maricoides (Marica-like). A form of *I. Sisyrinchium*.

I. orchioides (Orchid-like). *fl.*, tube 1½in. to 2in. long; limb 2in. long; falls having an obovate blade ½in. across, bright yellow, with a blotch of purple on each side of a crest running down the claw; standards less than 1in. long, with a long, filiform claw; spathes one-flowered, 2in. long. April. *l.* about six, lanceolate, acuminate, 6in. to 9in. long at flowering time. Stem three- to six-headed, often 1ft. to 1½ft. long. Mountains of Turkestan, 1880. (B. M. 7111; R. H. 1880, p. 337, f. 68.)

I. o. cærulea (blue). *fl.* lilac, with a bright yellow blotch in the centre of the blade of the fall.

I. o. oculata (eyed). *fl.* having the blade of the falls more spotted than in the type.

I. persica mardinensis. An early variety of the type, having soft grey-purple spotted flowers. Mesopotamia.

I. reticulata alba (white). A form having white flowers, with orange-yellow crests. 1894.

I. r. cyanea (blue). *fl.* having the limb of the falls slate-blue, much variegated. (R. G. 797.)

I. r. histrioides (*I. Histrio*-like).* *fl.* having the falls much mottled with white and lilac, both on the claw and on the broader, orbicular blade. Eastern Anatolia, 1891. (J. H. 1891, p. 121, f. 18.)

I. r. sophenensis. *fl.* smaller, more spreading, and less turbinate than in the type; falls with a light reddish-purple blade and a long narrow claw with a wavy yellow crest. February. Kharput, Asia Minor, 1885.

I. Rosenbachiana (Rosenbach's).* *fl.*, outer perianth segments spreading or reflexed, emarginately bilobed at apex; claws of the standards erect, striped with yellow, 1½in. long, the lamina obovate, striped orange, dark purple above; style very long, with three terminal branches, petaloid; spathes two-leaved, one-flowered, very fragrant. March. *l.* three to five, linear-lanceolate, acute. Bulb ovate, one- to three-flowered. Stem very short, one- to three-headed. Turkestan, 1886. (B. M. 7135; Gn. 653, f. 2.) There are two varieties.

I. R. cærulea (blue). *fl.* pale violet within; standards and style dark violet at apex. (R. G. 1227 a.)

I. R. violacea (violet). *fl.* purplish-violet within; standards and style dark purplish-violet at apex. (R. G. 1227 b.)

I. sindjarensis.* *fl.* slate-lilac; tube 3in. long; falls oblong-cuneate, 2in. long, with radiating darker lilac lines and a small yellow crest; standards deflexed, 1in. long. March. *l.* about eight, crowded, lanceolate, distichous, 5in. to 6in. long at flowering time. Mesopotamia, 1890. (B. M. 7145; G. C. 1890, i., 365.)

I. Sisyrinchium (Sisyrinchium). *fl.* lilac, fugitive; tube 1in. long; limb 1in. to 1½in. long; falls having a yellow spot bordered with white in the centre; standards shorter, ½in. to ¾in. long; spathes two- or three-flowered. April and May. *l.* two, linear, arcuate, 6in. to 12in. long. Stem terete, 6in. to 12in. long; heads one to three. Mediterranean region to India. SYNS. *Moræa Sisyrinchium* (B. M. 1407), *M. Tenoreana* (S. B. F. G., t. 110), *Xiphion Sisyrinchium* (B. M. 6096). *I. S. maricoides* (of which there is a large purple-flowered form) differs slightly in the filaments.

I. sophenensis. A form of *I. reticulata*.

I. spectabilis (remarkable). Thunderbolt Iris. This is merely a form of *I. Xiphium*, of more robust habit than the type, and having darker yellow flowers flushed with brown.

I. Tubergeniana (Van Tubergen's). *fl.* having falls of a bright yellow colour and minute, three-toothed standards. 1899. Allied to *I. caucasica* and *I. orchioides*.

I. Vartani (Dr. Vartan's).* *fl.*, perianth tube nearly white, 2½in. long, the limb pale slaty-lilac; falls oblong-spathulate, ½in. broad, copiously veined lilac on a paler ground, with a yellow carinal crest; standards erect, ¼in. broad; peduncle very short. October to December. *l.*, produced ones usually two, 8in. to

Iris—*continued.*

12in. long, dark green. Palestine, 1835. (B. M. 6342.) A pretty species.

I. Viviani (Vivian's). A sub-variety of *I. Xiphium.*

I. xiphioides. English Iris. Well-known garden varieties are: BLANCHEFLEUR, white, tinged rose; GRAAF BENTINCK, magenta, flaked white, crimson spotted; KING OF THE BLUES; LA CHARMANTE, lavender-blue and white, margined soft blue; and LILACINA, deep lavender, violet spotted.

I. x. argentea (silvery). A garden variety having white falls blotched with purple. 1891. (R. H. 1891, p. 36.)

FIG. 468. SPANISH IRIS AVALANCHE.

I. Xiphium (Xiphion). The correct name of the well-known Spanish Iris of our gardens, *I. vulgaris.*

I. X. lusitanica (Portuguese). A variety with yellow flowers. (B. M. 679, under name of *I. lusitanica.*)

I. X. l. Viviani (Vivian's). *fl.* yellow, large, wax-like; falls sulphur-yellow, with transparent veins and a large, golden blotch. Portugal, 1889.

The following garden varieties of *I. Xiphium* are amongst the best grown: AVALANCHE (Fig. 468), white, blotched yellow, fringed; CALIFORNIA, deep yellow, with orange blotch; CATHERINA, deep blue, white, and orange; GOLDEN KING, deep yellow; PRINCESS IDA, white and primrose, blotched orange; SNOWBALL, pure white, blotched deep yellow; THE MOOR, reddish-purple and brown; and THUNDERBOLT, bronzy-purple and warm brown, blotched deep orange.

IRONBARK. *See* **Eucalyptus leucoxylon.**

IRON SHRUB. *See* **Sauvagesia erecta.**

IROUCANA. Included under **Casearia** (which *see*).

ISABELIA (named in honour of H.I.H. Isabel, Comtesse d'Eu, a great patroness of science and horticulture). ORD. *Orchideæ.* A monotypic genus. The species is a very peculiar, creeping, pseudo-bulbous, one-leaved, epiphytal Orchid, allied to **Maxillaria** (which *see* for culture).

I. virginalis (virgin-white). *fl.* white, solitary; sepals subequal, the lower ones connate at base and produced in a short spur; petals narrower; lip entire, somewhat obcordate. April. *l.* linear-aciculate, long, acute. Pseudo-bulbs small, covered with reticulated, fibrous bracts. Brazil.

ISABELLA GRAPE. *See* **Vitis Labrusca.**

ISATIS. To the species described on p. 200, Vol. II., the following should be added:

I. Boissieriana (Boissier's). *fl.* yellow; inflorescence racemose-corymbose. *fr.*, silicules heteromorphous, pubescent. *l.*, upper ones oblong, acute, cordate-sagittate at base, entire; lower ones cuneate-oblong, acute, sinuate-toothed. *h.* about 1ft. Turkestan, 1876. Hardy annual.

ISCHARUM. To the species described on p. 201, Vol. II., the following should be added:

I. eximium (choice). *fl.* having the spathe dark purple on the upper side, and green spotted with red on the under-surface. *l.* broad, simple. Western Cilicia, 1898. Hardy. (G. C. 1898, xxiii., p. 126, f. 49.)

ISCHNASPIS FILIFORMIS. A species of Thread Scale found upon Palms in this country, but very destructive abroad to coffee plantations. *See* **Scale Insects.**

ISCHNIA. A synonym of **Tamonea** (which *see*).

ISCHNOSIPHON (from *ischnos*, thin, and *siphon*, a tube; in allusion to the slender, cylindrical corolla tube). SYN. *Hymenocharis.* ORD. *Scitamineæ.* A genus embracing about sixteen species of mostly tall, stove herbs, closely allied to *Maranta*, natives of tropical America. *I. Arouma*, *I. Parkeri* (SYN. *Phrynium Parkeri*), and *I. smaragdinus* (I. H. 1870, t. 16) are grown at Kew, but none of the species are in general cultivation.

ISCHYROLEPIS. A synonym of **Restio** (which *see*).

ISCUROCHLOA. A synonym of **Bambusa** (which *see*).

ISOETES (from *isos*, equal, and *etos*, the year; in allusion to the evergreen nature of the plants). Quillwort. ORD. *Selaginellaceæ.* A genus embracing about fifty species of broadly-distributed, stove, greenhouse, or hardy, stemless perennials, aquatic or growing in damp ground, with a two- or three-lobed rootstock of firm texture, emitting dense tufts of root-fibres from its under-side. Leaves without any lamina, forming a dense rosette, subulate, rounded at back, dilated at base. Sporangia not arranged in spikes, but embedded in the base of the leaves; macrospores very numerous. The genus is represented in Britain by *L. lacustris* and its Irish variety *Morei* (J. B. 1878, p. 353, t. 199). *I. Druriæi* is grown at Kew.

ISOLOMA. Including *Moussonia* and *Sciadocalyx.* **Tydæa** (which *see*) is also included hereunder by Bentham and Hooker. To the species described on p. 201, Vol. II., the following should be added:

I. elegans (elegant). *fl.* purple, the throat and limb yellowish within, purple-spotted; corolla 1½in. long, slightly incurved; umbels three- to four-flowered. *l.* opposite, petiolate, ovate-oblong, acuminate, crenate-toothed. Guatemala. Plant densely and softly villous-tomentose, often reddish. SYNS. *Moussonia elegans* (F. d. S. v., t. 439; L. & P. F. G. i., p. 123, f. 83), *M. formosa* (R. G. 1854, t. 101).

I. hirsutum (hairy). *fl.* orange-scarlet, with the upper lip scarlet and the lower one and the throat spotted with scarlet, tubular, abundantly produced. Origin not recorded, 1831. Plant of free growth.

I. ignoratum (unknown). *fl.* cinnabar-red, villous-hairy outside, part of the limb slightly spotted with yellow; peduncles one-flowered, axillary, solitary or twin. *l.* ternate, oblong, slightly acuminate, narrowed to the petioles, deeply and simply crenate. Stem erect, fleshy, silky-pilose. Central America. SYNS. *Gesnera ignorata*, *Kœhleria ignorata.*

I. jaliscanum (Jalisco). *fl.* borne in umbels; corolla scarlet, 1in. long. *l.* oblong-lanceolate, 1in. to 3in. long. Stem decumbent, pubescent. Mexico, 1896.

I. longifolium (long-leaved). *fl.* orange-red, disposed in a terminal raceme; limb regular; peduncles whorled in the upper axils, much longer than the petioles. *l.* opposite or almost alternate, crenulate-toothed, much narrowed at both ends. Guatemala, 1840. SYN. *Gesnera longifolia* (Gn. 1883, i., 644).

I. tubiflorum (tube-flowered). *fl.* yellow, tinged with red, rough with hairs; peduncles axillary, much shorter than the petioles. *l.* large, ovate, acuminate, slightly toothed, reticulated, strongly veined and pale beneath. Colombia, 1846. SYN. *Gesnera tubiflora.*

I. Luciani (SYN. *Sciadocalyx Luciani*, I. H. 1874, p. 151, f. 182), *I. rupestre* (SYN. *Kœhleria rupestris*), and *I. Warscewiczii* (SYN. *Sciadocalyx Warscewiczii*, B. M. 4843) have also been introduced.

ISOLOPHUS. Included under **Polygala** (which *see*).

ISONANDRA. This is in part synonymous with **Dichopsis** (which *see*).

ISOSOMA ORCHIDEARUM. *See* **Cattleya Fly.**

ISOTOMA. Including *Hippobroma*. To the species described on pp. 202-3, Vol. II., the following should be added:

I. petræa (rock-loving). *fl.* white, verging to flesh-colour, 1½in. long, the segments horizontal or reflexed, the three lower ones yellowish at their junction. *l.* lanceolate or ovate-lanceolate, acuminate, unequally laciniate. Stems branched, often 1ft. long, and many-flowered. Flinders Range, Australia. Plant highly glabrous.

I. breviflora (SYN. *Hippobroma breviflorum*) has also been introduced.

ISOTYPUS. Included under **Onoseris** (which *see*).

ITALIAN OAK. *See* **Quercus Esculus.**

ITALIAN STARWORT. *See* **Amellus Lychnitis.**

ITHURIEL'S SPEAR. *See* **Triteleia laxa.**

IVESIA UNGUICULATA. A synonym of **Potentilla unguiculata** (which *see*).

IVIRA. Included under **Sterculia** (which *see*).

IVORY NUT PALM. *See* **Phytelephas macrocarpa.**

IVY-LEAVED FERNS. *See* **Hemionitis.**

IVY-LEAVED PELARGONIUM. *See* **Pelargonium peltatum.**

IVY-LEAVED TOADFLAX. *See* **Linaria Cymbalaria.**

IXIA. Though not hardy in all parts of England, yet so graceful as to form and beautiful as to colour, as well as fragrant, are the flowers, that the bulbs should be planted wherever possible. Speaking generally, the species have been largely ousted by the many garden varieties, but a distinct and uncommon species like *I. viridiflora*, with light-green, black-centred flowers (Fig. 469), will always hold a foremost place. Ixias when grown outside are best planted in November, or later, and their quarters protected with light litter until early spring. They should be lifted each season. It is, however, as pot-plants that they excel, and five or six bulbs in a 3in. pot will produce a pretty effect in the greenhouse.

To the species, &c., described on pp. 203-4, Vol. II., the following should be added. A number of species formerly included here will be found under **Geissorhiza, Romulea, Sparaxis, Tritonia,** and **Watsonia.**

I. aristata (pointed). *fl.* many in a loose spike; perianth tube ⅜in. long, with a whitish limb of the same length. April. *l.* three or four, linear, firm, strongly ribbed, 4in. to 6in. long. Stems 1ft. to 1½ft. long. 1800. (B. M. 589.)

I. a. elegans (elegant). *fl.*, perianth tube and limb each ½in. long. *l.* narrower than in the type and not so firm. (R. G. 46, under name of *Würthia elegans*.)

I. bicolor (two-coloured). A synonym of *Synnotia bicolor*.

I. capillaris is identical with *I. scariosa*.

I. paniculata (panicled). *fl.* many, in loose, erect spikes; perianth tube 3in. long, the cream-white segments 1in. long, often tinged with red. May. *l.* two or three, linear, glabrous, 6in. to 18in. long. 1774. SYNS. *I. longiflora* (B. M. 256), *Tritonia longiflora* (B. M. 1502). In the variety *rochensis* the perianth tube is much shorter than in the type, and more dilated at the throat. SYN. *Tritonia rochensis* (B. M. 1503).

I. scariosa (scarious). The correct name of *I. aulica*. SYN. *I. capillaris*.

Varieties. Some of the best are here enumerated:

AZUREA, deep blue, with paler centre; BEAUTY OF NORFOLK, light yellow, black centre; CRATEROIDES, rich scarlet; DONNATELLO, brick-red, brown centre; EXCELSIOR, crimson-scarlet; HUMBERT, coppery-rose, black centre; LADY SLADE, light pink, brighter and darker centre; PRÆSTANS, reddish-crimson; and WHITE QUEEN, pure white, crimson centre.

IXIANTHES (from *ixos*, birdlime, and *anthos*, a flower; in allusion to the very viscous corolla). ORD. *Scrophularineæ*. A monotypic genus. The species is a greenhouse, erect-branched, hairy shrub, with the habit of *Retzia*, and closely allied to **Halleria** (which *see* for culture).

I. retzioides (Retzia-like). *fl.* one to three on short, axillary peduncles; corolla yellow, very viscous, the tube inflated, nearly 1in. long, the limb bilabiate, five-lobed, spreading. *l.* crowded, 4in. long, ⅓in. broad, pubescent, serrated at apex. *h.* 7ft. South Africa, 1839. (B. M. 7403.)

IXIOLIRION. Perianth regular, without any tube above the ovary, the segments oblanceolate, ascending, acute; stamens shorter than the segments, to the claws of which they are attached. Rootstock a tunicated bulb.

I. montanum (mountain-loving). According to J. G. Baker, this is the correct name of the plant described on p. 204, Vol. II., as *I. tataricum*, and *I. m. tataricum* is the proper name of *I. t. Ledebourii*. The variety *macranthum* has deep blue flowers shaded with purple, and *Sintenisi* has flowers of a lighter blue.

FIG. 469. IXIA VIRIDIFLORA.

IXORA. To the species described on pp. 204-5, Vol. II., the following varieties, &c., should be added:

I. alba (white). *fl.* white, corymbose. *l.* lanceolate, acute, 4in. to 5in. long, 1½in. to 2in. broad. India. (R. G. 1037.)

I. armeniaca (orange-coloured). *fl.* pale yellow, flushed with salmon. 1890. Habit dwarf and compact.

I. bella (pretty). *fl.* salmon-pink. 1881.

I. Burbidgei (Burbidge's). *fl.* bright orange-scarlet, in dense, axillary and terminal, cymose clusters. 1882. Very similar to *I. salicifolia* in general habit.

I. conspicua (conspicuous). A handsome form, with large trusses of buff-yellow flowers, changing to bright orange. 1886.

I. eminens (eminent). *fl.* at first clear buff, afterwards changing to light salmon-pink, large. 1885.

I. eximia (choice). *fl.* buff, changing to salmon-pink, long-tubed, disposed in large trusses. 1881.

I. ferrea (iron-like). *fl.* pink, few, in axillary or lateral, sessile, contracted corymbs; tube ¼in. long. *l.* oblong, acute,

Ixora—*continued.*

4in. to 6in. long, shortly petiolate. *h.* 20ft. West Indies, 1793. SYN. *Siderodendron trifiorum.*

I. Findlayana (Findlay's). *fl.* white, very fragrant. East Indies, 1883. Shrub of free growth and short, stocky habit.

I. formosa (beautiful). *fl.* orange-red, freely produced in large, globose clusters. (F. M., t. 284.)

I. Gemma (gem). *fl.* rich orange-yellow, borne in large, compact trusses. 1885.

I. illustris (brilliant). *fl.* of a bright orange-salmon colour, produced in large trusses. 1881.

I. insignis (remarkable). *fl.* deep rosy-crimson, shaded orange, disposed in a compact truss. Habit dwarf.

I. Morsei (Morse's). *fl.* bright orange, sometimes shaded with scarlet; trusses large and well-formed. 1834.

I. ornata (adorned). A variety producing a profusion of flowers of a bright orange-salmon colour. 1881.

I. salicifolia variegata (Willow-leaved, variegated). *l.* marked with a feathered, greyish stripe along the midrib. Sumatra, 1882.

I. salmonea (salmon-coloured). *fl.* buff and salmon-coloured. 1892.

I. speciosa (showy). *fl.* buff, changing to orange-salmon. 1886.

I. splendida (splendid). *fl.* brilliant orange-crimson, in large corymbs. 1883. (I. H. 463.)

I. venusta (charming). *fl.* at first bright orange, afterwards becoming salmon-buff, large.

I. Westii (West's). *fl.* pale rose, becoming bright rose with age, disposed in large, sub-globose trusses, 4in. to 6in. in diameter. 1882. Hybrid.

JACA. *See* **Artocarpus integrifolia.**

JACARANDA. *J. ovalifolia* is the correct name of *J. mimosæfolia.*

JACOBÆA. Included under **Senecio** (which *see*).

JACOBEA LILY. *See* **Sprekelia formosissima.**

JACOBINIA. Including *Drejera.* **Libonia** (which *see*) is also included hereunder by modern botanists. To the species described on p. 206, Vol. II., the following should be added:

J. magnifica (magnificent). A synonym of *J. carnea.* SYN. *Cyrtanthera magnifica.*

J. Mohintli (Mohintli). *fl.* orange-yellow, axillary; corolla bilabiate, the elongated tube inflated above, the upper lip slightly arched, the lower one curved in a spiral and three-toothed at apex. *l.* opposite, elongate-ovate, entire, coriaceous. Mexico, 1886. A half-hardy under-shrub, of bushy habit. SYNS. *Dicliptera scorpioides* (of gardens), *Drejera Willdenowiana, Sericographis Mohintli.*

J. pauciflora (few-flowered). The correct name of *Libonia floribunda.*

J. Pohliana (Pohl's).* *fl.* scarlet, disposed in a compact thyrse; corolla 2in. long, glabrous, scarcely viscid. *l.* ovate-oblong or ovate, 6in. long, cuneate at base, narrowed to the petioles. *h.* 3ft. to 9ft. Brazil. SYNS. *Cyrtanthera Pohliana, Justicia carnea.* The form *velutina* has pink flowers and velvety-pubescent bracts and leaves. There is another variety, *nana.*

J. sericea (silky). *fl.* red, disposed in terminal spikes; corolla 2in. long, very pubescent; pedicels axillary, very short, opposite, one-flowered. *l.* costate; lower ones oblong, acuminate at both ends; floral ones ovate. Peru, &c., 1819. Plant whitish-silky.

JACOB'S STAFF. *See* **Verbascum Thapsus.**

JACQUINIA. *Bonellia* is synonymous with this genus.

JACUANGA. A synonym of **Costus** (which *see*).

JALAMBICEA. A synonym of **Limnobium** (which *see*).

JALAPA. A synonym of **Mirabilis** (which see).

JALAP-PLANT. *See* **Ipomœa Purga.**

JAMAICA DOGWOOD. *See* **Piscidia.**

JAMAICA HONEYSUCKLE. *See* **Passiflora laurifolia.**

JAMAICA HORSE BEAN. *See* **Canavalia ensiformis.**

JAMAICA PAROQUET BUR. *See* **Triumfetta.**

JAMAICA PLUM. *See* **Spondias lutea.**

JAMAICA ROSE. *See* **Meriania.**

JAMBOLIFERA. A synonym of **Acronychia** (which *see*).

JAMESONIA. *J. imbricata* and its varieties all succeed well under greenhouse treatment. A compost of an open nature made of two parts fibrous peat, one part chopped sphagnum, and one part silver-sand, suits them best. They require copious watering at the roots, but should not be syringed overhead. Propagation is usually effected by division of the rhizomes, but they may also be increased by spores, which are abundantly produced, and germinate freely when sown in a warm temperature. Not being of a very decorative character, these Ferns, though thoroughly distinct, are not extensively found in private collections; their culture is generally limited to botanic gardens.

To the species described on p. 206, Vol. II., the following varieties should be added:

J. imbricata canescens (hoary). *fronds*, upper part so densely clothed with long, yellowish-brown hairs as to quite hide the hoary pinnæ. Habit stouter than the type.

J. i. Pearcei (Pearce's). *fronds* rather more than 1in. broad; pinnæ ¼in. long, oblong, densely hairy beneath, with revolute edges. Andes of Ecuador (at 10,000ft.).

J. i. verticalis (vertical). *sti.* wiry, 1ft. long. *fronds* 6in. to 9in. long, ¼in. broad; pinnæ oblong-triangular, naked; rachis covered with very short down.

JANIA. A synonym of **Bæometra** (which *see*).

JANKÆA. Included under **Ramondia** (which *see*), the correct name of *J. Heldreichii* being *R. serbica.*

JANTHE. A synonym of **Celsia** (which *see*)

FIG. 470. JAPANESE DWARFED TREE THUYA OBTUSA (286 Years Old).

JAPAN LACQUER or VARNISH TREE. *See* **Rhus vernicifera.**

JAPAN WAX. *See* **Rhus succedanea.**

JAPANESE ARBORICULTURE. An art of producing replicas in miniature of many of the largest and most decorative of landscape trees—Cedars and Oaks, for instance—ornamental trees of the garden proper, fruit-trees, and Palms, practised with great success by the Japanese. In Japan, miniature gardens, laid out with a scrupulous exactness as to detail in the landscape and its accessories, are common, and occupy but a few square feet. In this country the trees are comparative novelties, though the numerous ways in which they may be employed as dinner-table, conservatory, and outdoor subjects should ensure for them a measure of popularity—at least, with those to whom money is not an object, and providing our uncertain climate is suitable. When correctly treated, these trees are properly proportioned as regards trunk and branch, leaf and flower, and not mere outrages upon Nature. Many, too, are of great antiquity—centuries, in fact (Fig. 470 represents a specimen of *Thuya obtusa*, 286 years old, and standing but 3½ft. in height)—and the greater the age, the more expensive they are. The trees are sometimes raised from seed, at others from cuttings. At Kew a collection of these dwarfed trees may be found.

The method of dwarfing varies considerably with individuals, all of whom carefully guard their secrets. The chief subjects on which the art is practised are: Conifers, Maples, Beeches, Oaks, Pears (Fig. 471), Plums, Cherries,

FIG. 471. JAPANESE DWARFED TREE PYRUS SPECTABILIS (Height 2ft.).

Privets, Bamboos, Cycads, Wistarias, Podocarpuses, Magnolias, Orange-trees, and even Ferns. The dwarfing is brought about by root and branch restriction, whether the tree be raised from seed or from cuttings. Such restriction of the roots is commenced at the very outset, and may

Japanese Arboriculture—*continued.*

consist of either pinching or cutting. Very small pots and a very shallow rooting surface are employed, and generally the process is one of starving. Only when a

FIG. 472. JAPANESE DWARFED TREE PINUS DENSIFLORA.

tree is observed to be failing is a slight stimulant allowed, and potting shifts are not frequent. In some cases the dwarfing, after a time, becomes hereditary, when no restriction is of course necessary.

Apart, too, from the actual dwarfing of the trees, there are elaborate if fantastic systems of training, as in Fig. 472, which represents *Pinus densiflora*, specially trained by the late Mr. Mogi, of Tokio, and considered a marvellous example of the art; while still further variety is lent by colour-grafting, some of the Maples being very effective when thus treated. The illustrations (Figs. 470 to 473) represent some of the more popular subjects and methods, and for them we are indebted to Mr. Eida, of Conduit Street, and Messrs. Yamanaka and Co., of Japan, respectively. In Fig. 473 may be seen (1) a fine example of *Pinus densiflora* combined with a large rock, some shoots of variegated Bamboo, and a tiny bronze tea-house to form a Bonsai: it is an example of the Japanese skill in Bonkai gardening; (2) *Cryptomeria japonica* (height 14in.), surrounding a large rock, with a tiny bronze temple at the base and a quaint pagoda at the back, another example of Bonkai gardening (that is, the production of a landscape view in a very small space); 3 represents a golden variety

Japanese Arboriculture—*continued.*

of the *Thuya obtusa* (height 7in., length of branch 14in., age about thirty-five years)—a handsome example.

The treatment each subject requires to maintain it in health varies with the individual. According to Messrs. Yamanaka, several hours of sunshine each day is an important factor. Pines, for instance, need four or five hours' sun a day, to be watered every other day, and once a week to be thoroughly sprinkled. Maples also require the sun at least half of each day, to be watered once a day until the leaves fall, when they should be kept warm and only receive water twice a week until the new leaves are pushed in the spring.

1 2 3

FIG. 473. JAPANESE DWARFED TREES.
1, PINUS DENSIFLORA; 2, CRYPTOMERIA JAPONICA; 3, THUYA OBTUSA.

JAPANESE OAK. *See* **Quercus glabra.**

JAPANESE PAGODA-TREE. *See* **Sophora japonica.**

JAPANESE PEPPER. *See* **Zanthoxylum piperitum.**

JAPANESE TOAD LILY. *See* **Tricyrtis hirta.**

JAPANESE YEW. *See* **Cephalotaxus.**

JASIONE. SYN. *Ovilla.* To the species described on p. 206, Vol. II., the following should be added:

J. humilis (dwarf). *fl.* blue, rather pretty, on short, terminal peduncles. July and August. *l.* linear-obovate, flat, entire; radical ones approximate, disposed in a rosette. Stems simple, ascending. *h.* about 6in. Pyrenees, &c., 1824.

JASMINE, BOX. *See* **Phillyrea.**

JASMINE, ROCK. *See* **Androsace.**

JASMINUM. The hardy summer-flowering kinds should have their shoots thinned out in early summer, so that the remaining ones may have ample opportunity of becoming thoroughly matured, by which they are enabled to carry a goodly display of blossom. The winter-flowering sorts should be attended to in February, soon after the floral display is over. Cut away the old, exhausted wood and weakly shoots to make room for vigorous growths, as it is on the young wood that the flowers are produced. When plants are trained to walls, arbours, &c., a pleasing effect is obtained by planting some of the small, green-leaved Ivies in association, as the latter form an admirable setting for the rich golden-yellow flowers of the Jasmine; and if the vigorous shoots of the latter are secured to the wall, &c., and the young growths allowed to hang gracefully, the effect at flowering-time is very fine.

To the species described on pp. 207-8, Vol. II., the following should be added:

J. affine (related). A form of *J. officinale.*

J. angulare (angular-stemmed). *fl.* white, disposed in terminal cymes; calyx teeth short, ovate, acute; corolla tube 1in. to 1¼in. long, the limb of five or six spreading, lanceolate lobes. *l.* trifoliolate. Stems angular. South Africa, 1886. An ornamental, scrambling, greenhouse shrub. (B. M. 6865.)

J. luteum (yellow). A synonym of *J. fruticosum.*

J. nitidum (shining). *fl.* white, fragrant, ¾in. long; racemes short, few-flowered. *l.* simple, lanceolate, 3in. long. Stems thin. Admiralty Islands, 1898. Stove climber.

J. polyanthum (many-flowered). *fl.* pink outside, white within, very strongly scented; corolla about 1¼in. long, with a long tube. *l.* opposite, pinnate; leaflets five to seven, lanceolate, acuminate, coriaceous. Stems long, sarmentose. Yunnan, China, 1891. Greenhouse shrub. (R. H. 1891, f. 69.)

JATEORHIZA. Male flowers in long, slender, axillary, racemose panicles, usually sessile on the short lateral branches; females in simple or nearly simple racemes. Leaves large, membranous, palmately lobed. *J. Columba* is the correct spelling of *J. Calumba.*

JATROPHA. Physic Nut. To the species described on p. 209, Vol. II., the following should be added:

J. gossypiifolia (Gossypium-leaved). *fl.* of a beautiful reddish-purple, many in paniculate cymes. May to August. *l.* lobed above the middle, 5in. to 6in. broad; segments usually obovate, acuminate, the margins doubly serrated or crenate, densely glandular. Warm regions of America, 1690. (B. R. 745; L. B. C. 117.)

J. hastata (halberd-shaped). The correct name of *J. panduræfolia.*

J. integerrima. The correct name is *Manihot diversifolia.*

J. Manihot (of Linnæus). A synonym of *Manihot utilissima.*

JEFFERSONIA. *J. binata* is the correct name of the plant described on p. 208, Vol. II., as *J. diphylla.*

JEHLIA. Included under **Lopezia** (which *see*), the correct name of *J. fuchsioides* being *L. macrophylla.*

JERUSALEM CHERRY. *See* **Solanum Pseudocapsicum.**

JESSENIA (named in honour of Dr. Carl Jessen, Professor of Botany). ORD. *Palmæ.* A small genus

Jessenia—*continued.*

(three species) of stove, unarmed Palms, allied to *Euterpe*, natives of South America. Flowers mediocre, monœcious on the same spadix; spathes two, fusiform; spadices pendulous, shortly pedunculate. Leaves terminal, very numerous, equally pinnatisect; segments crowded, opposite, ensiform. *J. amazonum* is grown at Kew, but it is not in general cultivation.

JESUIT'S NUT. *See* **Trapa natans.**

JEW BUSH. *See* **Pedilanthus tithymaloides.**

JEW'S APPLE. *See* **Aubergine** and **Solanum Melongena.**

JEZABEL. A synonym of **Freycinetia** (which *see*).

JOCASTE. A synonym of **Smilacina** (which *see*).

JOE PYE WEED. *See* **Eupatorium purpureum.**

JOHNIA. Included under **Salacia** (which *see*), the correct name of *J. coromandeliana* being *S. prinoides*.

JOINT FIR. *See* **Ephedra.**

JOLIFFIA. A synonym of **Telfairia** (which *see*).

JOSEPHA. A synonym of **Bougainvillæa** (which *see*).

JOSEPHIA. A synonym of **Dryandra** (which *see*).

JOSEPH'S COAT. *See* **Amarantus splendens.**

JOSSINIA. Included under **Eugenia** (which *see*).

JUANIA (in allusion to the habitat of the plant). ORD. *Palmæ*. A monotypic genus. The species is an elegant, slender, unarmed, stove Palm, allied to **Ceroxylon** (which *see* for culture).

J. australis (Southern). *fl.* small, solitary. *fr.* globose, as large as a Cherry. *l.* terminal, pinnatisect; segments elongated, narrow, ensiform, acuminate, striate-nerved, silvery beneath, thickened on the margins, recurved at base; petioles slender, squamose-scurfy. Juan Fernandez.

JUANULLOA. *J. aurantiaca* (SYNS. *Brugmansia floribunda*, *B. parviflora*) is the correct name of *J. parasitica*.

JUGLANS. To the species and varieties described on pp. 210-11, Vol. II., the following should be added. Several species formerly classed hereunder are now referred to **Carya** and **Pterocarya.**

J. regia. The following varieties may be mentioned: *heterophylla*, leaflets laciniate; *maxima* (SYN. *macrocarpa*), nut very large; *monophylla*, leaves with only one leaflet, a curious form; and *serotina*.

J. Sieboldiana (Siebold's). The correct name of *J. ailantifolia*.

J. Vilmoriniana (Vilmorin's). *fr.* globular. *l.* having about five pairs of ovate, coriaceous, glabrous leaflets. The origin of this tree is uncertain; but it is said to be a hybrid between *J. regia* and *J. nigra*. (G. & F. 1891, p. 52, f. 11, 12.)

JUJUBE LOTUS. *See* **Zizyphus Lotus.**

JULIANA. A synonym of **Choisya** (which *see*).

JULIDÆ. This is one of the families into which the Order *Chilognatha* is split up by naturalists. It contains the very familiar **Millipedes** (which *see*), and is characterised by having a cylindrical body; by the possession of more than thirty rings, and many eyes in a cluster. All the species usually met with are more or less injurious. The best known is *J. terrestris*.

JUNCAGINEÆ. Included under **Naiadaceæ** (which *see*).

JUNCUS. Including *Tenageia*. According to Hooker, sixteen species of this genus are natives of Britain.

JUNGIA (named in honour of Joachim Jung, of Lübeck). SYNS. *Dumerilia* (of Lagasca), *Martrasia*, *Rhinactina*, *Trinacte*. ORD. *Compositæ*. A genus comprising about a dozen species of stove or greenhouse, erect or somewhat climbing, sub-shrubs or tall herbs, natives of South America from Chili to Brazil, and extending as far as Colombia. Flower-heads yellow or pink, small or mediocre, homogamous, paniculate at the

Jungia—*continued.*

tips of the branches; involucre cylindrical or campanulate, the bracts in one or two series. Leaves alternate, varying from orbicular to linear. It is doubtful if *J. rugosa* (*J. spectabilis* of gardens), the only species introduced, is still in cultivation.

JUNIPERUS. Junipers may be increased by grafting on the common species in spring, and plants so raised make good-sized specimens in less time than those raised from cuttings. Young, well-ripened shoots of the previous summer's growth should be selected, and if they are placed in a warm close case a union will be effected in a few weeks' time, after which they should be gradually hardened off, neatly staked, and grown on in cold frames until ready for planting out the following spring in nursery rows in the open ground, the soil most suitable being composed of fibrous loam and leaf-mould. Some of the dwarf-growing forms are well suited for planting on rockeries. A few of the best are *J. sabina* and its varieties, *J. procumbens*, *J. littoralis*, *J. communis*, and *J. c. aureus*.

DISEASES. Junipers are attacked by several species of fungi, one of the worst being *Trametes radiciperda* (*Fomes annosus*), which causes the well-known Root-Rot upon *J. communis* and certain other Conifers (*see* **Pinus —Fungi,** Vol. III.). A very distinct species causing great destruction on the Continent is *Herpotricha nigra* (*see* **Pine-Leaf Fungi**). Then there are no fewer than four species of very complex fungi belonging to the genus **Gymnosporangium** (which *see*), whose teleutospore stage is passed upon the Common Juniper or some of its near allies. *G. clavariæforme* produces in late spring somewhat leathery yellow masses from swollen spots on the branches; the æcidium, or cluster-cup, stage is passed upon the Hawthorn or upon the Pear or a close ally. *G. sabinæ* is found upon several species of Juniper, the teleutospores being of a dirty-brown colour; the æcidium-stage causes the disease known as Pear-Leaf Rust (*Roestelia cancellata*), described and illustrated in Vol. III. *G. confusum*, as regards its æcidium-stage, is passed upon the Medlar and the Quince, and the shredded cluster-cups may be found on the hardened orange spots on the infested leaves. *G. juniperinum* forms its teleutospores upon the Common Juniper and *J. c. nanus*, but passes its æcidium-stage upon Mountain Ash foliage, where the torn cluster-cups are found upon deep orange spots. In all these cases the remedy is to get rid of one or other of the host-plants, often a most difficult matter, as they may be situate some distance from the infested area.

To the species and varieties described on pp. 211-14, Vol. II., the following should be added:

J. communis aureus (golden). An elegant, drooping form, golden-tinted. 1896.

J. conferta (crowded). A synonym of *J. littoralis*.

J. davurica (Dahurian). *l.* opposite or in whorls of three; those on the male plant very small, imbricated in four rows, shortly pointed; those on the females whorled, linear, awl-shaped, spreading, sharp-pointed, densely disposed, channelled and whitish above, convex at back. Branches terete, forked, widely spreading. Dahurian Mountains, 1791.

J. fœtidissima (very fœtid). *l.* on the branches and primary branchlets ovate or lanceolate, acuminate, quadrifariously opposite; those on the secondary branchlets ovate-rhomboid, slightly acute, convex on the back. Branches terete, erect; branchlets somewhat tetragonal. Orient. A shrub (10ft. to 12ft. high) or tree, often confused with *J. excelsa*.

J. littoralis (shore-loving). *fr.* tawny-brown, with a violet bloom, globose, rather above ¼in. long. *l.* thickly placed in threes, linear, three-sided, rigid, openly imbricated, sharp-pointed, ¼in. long, half a line wide; upper side channelled and longitudinally white-marked, the under one convex and keeled. Japan. Allied to *J. rigida*, but the leaves are more crowded. SYN. *J. conferta*.

J. mexicana (Mexican). *l.* in opposite pairs, only ⅛in. long, ovate, closely imbricated on the small branches in four rows, dull greyish; those on young plants mostly in threes. Branches angular, horizontal, ascending at the ends. *h.* usually 20ft. to 30ft. Mexico. Only hardy in warm situations.

J. pseudo-Sabina (false Savin). *l.*, those on the lower branches linear, pungent, those on the terminal branchlets quadrifarious, closely imbricated, appressed, the largest ⅛in. long, rather spreading, the smallest ⅛in. long, rhombic-ovate. Temperate Himalayas, &c. A robust shrub or tree.

J. Sanderi (Sander's). A compact, dense-growing, dwarf species, said to have been introduced from Tibet. 1899.

Juniperus—*continued.*

J. taxifolia (Yew-leaved). *l.* sessile, in whorls of three, linear, slightly rounded at apex, rigid, spreading, glaucous above, dark green below, with a strong rib ending in a point. Branches few, scattered, somewhat spreading, pendulous at apex. *h.* 8ft. to 10ft. Japan and China.

J. virginiana reptans (creeping). A prostrate variety, suitable for rockeries, &c. 1896.

J. v. turicensis (Zurich). A variety of compact, pyramidal habit and with bluish-grey leaves. 1896.

The following species are also grown at Kew: *J. Cedrus* and *J. flaccida* (under glass), *J. Henryana*, *J. littoralis*, *J. macropoda*, *J. procera*, and *J. tetragona.*

JUNO'S TEARS. *See* **Verbena officinalis.**

JUPITER'S BEARD. *See also* **Sempervivum tectorum.**

JUPITER'S DISTAFF. *See* **Salvia glutinosa.**

JURINEA. *J. cyanoides* (Syns. *J. Pollichii*, *Serratula cyanoides*), *J. linearifolia* (Syns. *Serratula linearifolia*, *S. multiflora*), and *J. mollis* (Syn. *Serratula transylvanica*) have been introduced, but are probably no longer grown.

JUSSIÆA. *Jussieua* is, according to the "Index Kewensis," the correct name. To the species described on p. 214, Vol. II., the following should be added:

J. macrocarpa ciliata (large-fruited, ciliated). A synonym of *J. peruviana ciliata.*

J. natans (swimming). *fl.* white, pedunculate; calyx lobes four or five, acute, shorter than the ovate petals. *l.* petiolate, sub-orbicular, entire or toothed. Colombia (in stagnant water). A glabrous, stove, aquatic perennial.

J. peruviana ciliata (ciliated). *fl.* yellow, 2in. across, axillary. *l.* alternate, ciliated. Stems hairy, with five winged angles. Colombia, 1880. Half-hardy. Syn. *J. macrocarpa ciliata.*

JUSTICIA. Including *Rostellaria.* To the species described on p. 214, Vol. II., the following should be added. *See also* **Aphelandra, Chætothylax, Dianthera, Echolium, Jacobinia, Peristrophe, Schaueria, Sphinctacantha,** and **Thyrsacanthus,** for species formerly included under *Justicia.*

J. campylostemon (curved-stamened). *fl.* white, small, with some purple spots on the disk of the middle lobe of the lower lip; peduncles axillary, mostly shorter than the leaves, one- to several-flowered. Winter. *l.* ovate or ovate-lanceolate, acuminate, glabrous except on the nerves beneath. *h.* 2ft. Natal, 1883. An unattractive species.

JUTE-PLANT. *See* **Corchorus capsularis.**

KADSURA. Flowers unisexual; sepals and petals nine to fifteen. *K. propinqua* is synonymous with *Schizandra propinqua*, and *K. chinensis* (of Hance) is identical with *Schizandra Hanceana.*

KÆMPFERA. A synonym of **Tamonea** (which *see*).

KÆMPFERIA. To the species described on p. 214, Vol. II., the following should be added:

K. angustifolia (narrow-leaved). *fl.* few, in a central, sessile spike; corolla tube (and staminodes) white, twice as long as the segments; lip lilac, deeply cut into two lobes. *l.* many, ascending, lanceolate, 6in. to 8in. long. Root tuberous. Eastern Himalayas.

K. atrovirens (dark green).* *fl.* violet-purple, 1¼in. in diameter, the lip spotted yellowish at base; spike few-flowered, shortly exserted from the sheath. *l.* 2in. to 5in. long, 1½in. to 2in. broad, obliquely elliptic-oblong, acute, dark green above, rather paler towards the margins, more or less suffused with purple beneath; petioles 4in. to 5in. long, channelled, sheathing at base. *h.* 9in. Borneo, 1886. (I. H. 1886, t. 610.)

K. Ethelæ (Mrs. Ethel Beningfield).* *fl.* rose-purple, with a blotch of yellow on the lip-like lower segments, solitary, 4in. across. Spring. *l.* oblong-lanceolate, 1ft. long. Stem at first 8in. high, afterwards lengthening to 2ft. Natal, 1898. Allied to *K. Kirkii.* (G. C. 1898, xxiii., p. 94, f. 34.)

K. Kirkii (Kirk's). The correct name of *Cienkowskia Kirkii.* (R. G. 1364.)

K. longa (long). A synonym of *K. rotunda.*

K. macrosiphon (large-tubed). *fl.* numerous, on short peduncles; corolla tube long and slender; lobes blue, 1in. long, the lower one 1in. broad. *l.* tufted, lanceolate, 1ft. long. German East Africa, 1898. Allied to *K. Kirkii.*

Kæmpferia—*continued.*

K. ovalifolia (ovate-leaved). The correct name of *K. Parishii.*

K. pandurata (fiddle-shaped). *fl.* in a peduncled spike, hidden in the dilated bases of the petioles; corolla tube 2in. to 2½in. long, the segments whitish; lip tinged with red, 1in. long. *l.* oblong, 9in. to 12in. long, erect. Ceylon, &c. Cultivated in India, &c., for its Ginger-like rootstock.

K. secunda (side-flowering). *fl.*, calyx tubular, slender, split above; corolla tube reddish, nearly 1in. long, very slender, curved, the lobes elliptic-oblong, acuminate; lateral staminodes broadly oblong or rounded, spreading, rather reflexed; lip rounded, shortly bifid or notched at end; spike terminal, few-cleft. September. *fr.* three to four lines long, ovoid, many-seeded. *l.* 3in. to 3½in. long, the lower ones smaller, membranous, obliquely lanceolate, caudate-acuminate. Assam and Khasia Mountains, 1873. (B. M. 6999; Gn. 1873, iv., p. 154.) Syn. *Monolophus secunda.*

K. speciosa (showy).* *fl.* pure white, disposed in a sessile head; corolla tube 3in. long, the segments, staminodes, and lip about 1in. long. *l.* sub-orbicular, erect, shortly petiolate, 5in. to 6in. long, plain green or variegated. Birma.

K. vittata (striped). *fl.* not very conspicuous; inflorescence central. August. *l.* 3½in. to 4½in. long, elliptic, slightly oblique, rounded at base, dark green above, with a feathery grey stripe ¼in. broad along the midrib; under-surface greyish-green; petioles 3½in. to 5in. long, vaginate for half their length. *h.* 9in. Sumatra, 1881. A pretty foliage plant.

KAFFIR BEAN-TREE. *See* **Schotia.**

KAFFIR LILY. *See* **Schizostylis coccinea.**

KAGENECKIA. *K. cratægoides* is identical with, or a form of, *K. oblonga.*

KAHIRIA. A synonym of **Ethulia** (which *see*).

KAINIT. A cheap form of potassic fertiliser. The crude Kainit found in commerce contains 12 per cent. to 13 per cent. of potash, 27 per cent. to 30 per cent. of magnesia, and 30 per cent. of common salt. It is more valuable in light loam than in heavier soils, which it makes more sticky. A fair dressing per acre would be from 3cwt. to 6cwt., mixed with other fertilisers, and worked well into the soil.

KAKI. *See* **Diospyros.**

KALANCHOE. To the species described on p. 216, Vol. II., the following should be added:

K. acutiflora (acute-flowered). *fl.* whitish; corolla segments rather acute; cymes paniculate. August. *l.* broadly lanceolate, crenate. *h.* 2ft. Habitat not known, 1805. Stove. Syn. *Vareia acutiflora* (A. B. R. 560).

K. ægyptiaca (Egyptian). A synonym of *K. crenata.*

K. Bentii (M. Theodore Bent's).* *fl.* white, in an erect loose panicle; calyx consisting of four fleshy, spreading lobes; corolla inflated at base, distinctly four-angled. *l.* sub-cylindrical, rigid, narrowed gradually to an acute point, arranged decussately in pairs at top of the stem. *h.* 3ft. Hadramaut, 1894. The largest flowered of all the Kalanchoes known to cultivation.

K. carnea (flesh-coloured).* *fl.* pink, fragrant, ½in. in diameter, disposed in corymbose cymes. *l.* fleshy, petiolate, elliptic-ovate, obtuse, crenate, brownish-green, 3in. to 5½in. long, 1½in. to 3in. broad. Stem, when old, forming a large bole. South Africa, 1886. An attractive, greenhouse, glabrous succulent. (G. C. 1887, i., p. 211, f. 48.)

K. Cassiopeia (Cassiopeia). This is described as a dwarf, greenhouse species with Echeveria-like, bluish-green, toothed leaves. Abyssinia, 1894. Greenhouse.

K. flammea (flame-coloured). *fl.* bright scarlet, tubular, numerous in an erect, long-stalked, corymbose cyme. *l.* fleshy, crenate, shorter than in *K. glaucescens* (which this species resembles). Stems 1ft. high. Somaliland, 1897. Greenhouse.

K. glaucescens (glaucescent). *fl.* red or dark yellow, in compact di- or trichotomous panicles, or on few-flowered peduncles from the upper nodes. *l.*, lower ones narrow-ovate, crenate, obtuse, glabrous, 5in. long, narrowed to amplexicaul petioles. Stem terete, glabrous, with ascending, pubescent branches 2ft. to 3ft. in height. Abyssinia, 1894. Greenhouse.

K. grandiflora (of gardens). A synonym of *K. marmorata.*

K. laciniata (torn). *fl.* yellow; sepals lanceolate, somewhat spreading; cymes glabrous. July and August. *l.* once-pinnatifid; segments ¼in. to 1in. broad, flat, incised-crenate, sometimes bipinnatifid. *h.* 2ft. India and tropical Africa, 1781. Stove. There is a form having pubescent cymes and leaves twice or thrice pinnatifid.

K. marmorata (marbled).* *fl.* white; corolla tube 2in. long, the limb 2in. in diameter; cymes few-flowered. *l.* obovate-

Kalanchoe—*continued.*

(of gardens).

KALMIA. Few hardy subjects are more valued than these dwarf-growing shrubs, and especially *K. latifolia* (American Mountain Laurel), which is attractive either for its flowers or its foliage. It is, as stated in Vol. II., largely employed for forcing; but, after flowering, plants so employed should be placed in gentle heat, and freely syringed. This will induce the pushing of new growths, when the plants should be gradually hardened off and planted out on a warm, sunny border to ripen their wood. *K. latifolia* (Fig. 475) is also an exceedingly good subject for winter beds.

To the species described on p. 216, Vol. II., the following varieties should be added:

K. latifolia myrtifolia (Myrtle-leaved). A dwarf, garden form. 1883. SYN. *K. myrtifolia* (R. H. 1883, p. 10).

K. l. Pavarti (Pavart's). A variety with very bright-coloured flowers. 1883. (R. H. 1883, p. 540.)

K. myrtifolia (Myrtle-leaved). A dwarf form of *K. latifolia*.

KALOROCHEA LANGLEYENSIS. This name has been given to a hybrid between *Crassula coccinea* and *C. falcata*. *C. langleyensis* is, however, its correct name.

KALOSANTHES VERSICOLOR. A synonym of **Rochea versicolor** (which *see*).

KAMBALA-TREE. *See* **Sonneratia apetala.**

KANGAROO APPLE. *See* **Solanum aviculare.**

KARATAS. According to the latest classification by Mr. J. G. Baker, this genus embraces about three dozen ies. Flowers red, violet, or white; sepals free down the ovary; petals united in a distinct tube, the nents lingulate or ovate; stamens inserted in the lla tube, not reaching to the tips of the segments; ls usually sessile, each subtended by a bract, and shortened inner leaves usually bright-coloured. Fruit ate. To the species described on pp. 216-7, Vol. II., following should be added:

acanthocrater (strong-spined). *fl.* purplish or bluish, in a nse head in the centre of the leaves. May. *l.* forming a nse rosette, spreading, obtuse, with spiny margins, dark en above, greyish-banded beneath; inner ones brownish-otted. Brazil, 1885. A large species, 2½ft. to 3ft. in diameter. . M. 6904.) SYN. *Nidularium acanthocrater* (B. H. 1884, 9).

agavæfolia (Agave-leaved). *fl.* white, in a nearly sessile, ntral head, overtopped by the bright red inner leaves; petals lf as long again as the sepals. *l.* thirty to forty in a dense sette, lanceolate, 2ft. to 3ft. long, 2in. to 3in. broad, ch narrowed to the base, armed with large, pungent ickles. Cayenne, 1853.

amazonica (Amazons). *fl.* white, with a greenish tube, sposed in a dense, sessile head in the centre of the rosette; acts greenish-brown. June. *l.* rosulate, 1ft. to 1½ft. long, . to 3in. broad, greenish-brown on the face, glossy claret-own on the back, without markings or scales, the margins ely serrated. Amazons, 1870. SYNS. *Echmea amazonica*, *omelia amazonica.*

ampullacea (pitcher-like).* *fl.* about twelve in a head; pals and bracts green; corolla blue, white at the throat. *l.* v, short, obtuse, acuminate, green, spotted with reddish-own, especially beneath. Brazil, 1881. A distinct and pretty ecies, producing numerous suckers; it is remarkable for the nner in which the long sheaths of the leaves are collected o a sort of ovoid pitcher. SYN. *Nidularium ampullaceum* . H. 1886, p. 296).

antiacantha (opposite-spined). This is described as omething in the way of *K. Legrellæ*, but larger; the ves are brownish at the base, and the bracts of a deeper

FIG. 475. KALMIA LATIFOLIA.

Juniperus—*continued.*

J. taxifolia (Yew-leaved). *l.* sessile, in whorls of three, linear, slightly rounded at apex, rigid, spreading, glaucous above, dark green below, with a strong rib ending in a point. Branches few, scattered, somewhat spreading, pendulous at apex. *h.* 8ft. to 10ft. Japan and China.

J. virginiana reptans (creeping). A prostrate variety, able for rockeries, &c. 1896.

J. v. turicensis (Zurich). A variety of compact, pyran habit and with bluish-grey leaves. 1896.

The following species are also grown at Kew: *J. Cedrus J. flaccida* (under glass), *J. Henryana, J. littoralis, J. macro J. procera,* and *J. tetragona.*

JUNO'S TEARS. *See* **Verbena officinalis.**

JUPITER'S BEARD. *See also* **Semperviv tectorum.**

JUPITER'S DISTAFF. *See* **Salvia glutinos**

JURINEA. *J. cyanoides* (Syns. *J. Pollichii, Se tula cyanoides*), *J. linearifolia* (Syns. *Serratula line folia, S. multiflora*), and *J. mollis* (Syn. *Serra transylvanica*) have been introduced, but are probably longer grown.

JUSSIÆA. *Jussieua* is, according to the "In Kewensis," the correct name. To the species descri on p. 214, Vol. II., the following should be added:

J. macrocarpa ciliata (large-fruited, ciliated). A syno of *J. peruviana ciliata.*

J. natans (swimming). *fl.* white, pedunculate; calyx lo four or five, acute, shorter than the ovate petals. *l.* petiol sub-orbicular, entire or toothed. Colombia (in stagn water). A glabrous, stove, aquatic perennial.

J. peruviana ciliata (ciliated). *fl.* yellow, 2in. acr axillary. *l.* alternate, ciliated. Stems hairy, with winged angles. Colombia, 1880. Half-hardy. Syn. *J. ma carpa ciliata.*

JUSTICIA. Including *Rostellaria.* To the spec described on p. 214, Vol. II., the following should be add *See also* **Aphelandra, Chætothylax, Dianthe Echolium, Jacobinia, Peristrophe, Schauer Sphinctacantha,** and **Thyrsacanthus,** for spec formerly included under *Justicia.*

J. campylostemon (curved-stamened). *fl.* white, small, w some purple spots on the disk of the middle lobe of the lo lip; peduncles axillary, mostly shorter than the leaves, one- several-flowered. Winter. *l.* ovate or ovate-lanceolate, a minate, glabrous except on the nerves beneath. *h.* 2ft. Nat 1823. An unattractive species.

JUTE-PLANT. *See* **Corchorus capsularis.**

KADSURA. Flowers unisexual; sepals and petals ni to fifteen. *K. propinqua* is synonymous with *Schizand propinqua,* and *K. chinensis* (of Hance) is identical with *Schizandra Hanceana.*

KÆMPFERA. A synonym of **Tamonea** (which *see*).

KÆMPFERIA. To the species described on p. 214, Vol. II., the following should be added:

K. angustifolia (narrow-leaved). *fl.* few, in a central, sessile spike; corolla tube (and staminodes) white, twice as long as the segments; lip lilac, deeply cut into two lobes. *l.* many, ascending, lanceolate, 6in. to 8in. long. Root tuberous. Eastern Himalayas.

K. atrovirens (dark green).* *fl.* violet-purple, 1½in. in diameter, the lip spotted yellowish at base; spike few-flowered, shortly exserted from the sheath. *l.* 2in. to 5in. long, 1½in. to 2in. broad, obliquely elliptic-oblong, acute, dark green above, rather paler towards the margins, more or less suffused with purple beneath; petioles 4in. to 5in. long, channelled, sheathing at base. *h.* 9in. Borneo, 1886. (I. H. 1886, t. 610.)

K. Ethelæ (Mrs. Ethel Beningfield).* *fl.* rose-purple, with a blotch of yellow on the lip like lower segments, solitary, 4in. across. Spring. *l.* oblong-lanceolate, 1ft. long. Stem at first 2in. high, afterwards lengthening to 2ft. Natal, 1888. Allied to *K. Kirkii.* (G. C. 1893, xxiii., p. 94, f. 34.)

K. Kirkii (Kirk's). The correct name of *Cienkowskia Kirkii.* (R. G. 1364.)

K. longa (long). A synonym of *K. rotunda.*

K. macrosiphon (large-tubed). *fl.* numerous, on short peduncles; corolla tube long and slender; lobes blue, 1in. long, the lower one 1in. broad. *l.* tufted, lanceolate, 1ft. long. German East Africa, 1890. Allied to *K. Kirkii.*

Kæmpferia—*continued.*

K. ovalifolia (ovate-leaved). The correct name of *K. Parishii.*

K. pandurata (fiddle-shaped). *fl.* in a peduncled spike, hidden in the dilated bases of the petioles; corolla tub

KALANCHOE MARMORATA.

By an unfortunate error, which was not discovered in time, the printers used a wrong block for illustrating Kalanchoe Marmorata. It should have been as above; that which was given was of *Incarvillea Delavayi*

the largest flowered of all the Kalanchoes known to cultivation.

K. carnea (flesh-coloured).* *fl.* pink, fragrant, ½in. in diameter, disposed in corymbose cymes. *l.* fleshy, petiolate, elliptic-ovate, obtuse, crenate, brownish-green, 3in. to 5½in. long, 1½in. to 3in. broad. Stem, when old, forming a large bole. South Africa, 1886. An attractive, greenhouse, glabrous succulent. (G. C. 1887, i., p. 211, f. 48.)

K. Cassiopeia (Cassiopeia). This is described as a dwarf, greenhouse species with Echeveria-like, bluish-green, toothed leaves. Abyssinia, 1894. Greenhouse.

K. flammea (flame-coloured). *fl.* bright scarlet, tubular, numerous in an erect, long-stalked, corymbose cyme. *l.* fleshy, crenate, shorter than in *K. glaucescens* (which this species resembles). Stems 1ft. high. Somaliland, 1897. Greenhouse.

K. glaucescens (glaucescent). *fl.* red or dark yellow, in compact di- or trichotomous panicles, or on few-flowered peduncles from the upper nodes. *l.*, lower ones narrow-ovate, crenate, obtuse, glabrous, 5in. long, narrowed to amplexicaul petioles. Stem terete, glabrous, with ascending, pubescent branches 2ft. to 3ft. in height. Abyssinia, 1894. Greenhouse.

K. grandiflora (of gardens). A synonym of *K. marmorata.*

K. laciniata (torn). *fl.* yellow; sepals lanceolate, somewhat spreading; cymes glabrous. July and August. *l.* once-pinnatifid; segments ¼in. to 1in. broad, flat, incised-crenate, sometimes bipinnatifid. *h.* 2ft. India and tropical Africa, 1781. Stove. There is a form having pubescent cymes and leaves twice or thrice pinnatifid.

K. marmorata (marbled).* *fl.* white; corolla tube 2in. long, the limb 2in. in diameter; cymes few-flowered. *l.* obovate-

Kalanchoe—*continued.*

FIG. 474. KALANCHOE MARMORATA.

cuneate, 4in. long, green, blotched with brown. Stems leafy. Abyssinia, 1892. Greenhouse. See Fig. 474. (B. M. 7333.) SYN. *K. grandiflora* (of gardens).

K. spathulata (spathulate). *fl.* orange-yellow, in loose, paniculate cymes. July and August. *l.* glabrous, obovate-spathulate, crenulate; lower ones obtuse; upper ones acute. *h.* 2ft. to 2½ft. China, 1820. Greenhouse. SYN. *Cotyledon hybrida* (of gardens).

KALMIA. Few hardy subjects are more valued than these dwarf-growing shrubs, and especially *K. latifolia* (American Mountain Laurel), which is attractive either for its flowers or its foliage. It is, as stated in Vol. II., largely employed for forcing; but, after flowering, plants so employed should be placed in gentle heat, and freely syringed. This will induce the pushing of new growths, when the plants should be gradually hardened off and planted out on a warm, sunny border to ripen their wood. *K. latifolia* (Fig. 475) is also an exceedingly good subject for winter beds.

To the species described on p. 216, Vol. II., the following varieties should be added:

K. latifolia myrtifolia (Myrtle-leaved). A dwarf, garden form. 1883. SYN. *K. myrtifolia* (R. H. 1883, p. 10).

K. l. Pavarti (Pavart's). A variety with very bright-coloured flowers. 1883. (R. H. 1883, p. 540.)

K. myrtifolia (Myrtle-leaved). A dwarf form of *K. latifolia*.

KALOROCHEA LANGLEYENSIS. This name has been given to a hybrid between *Crassula coccinea* and *C. falcata*. *C. langleyensis* is, however, its correct name.

KALOSANTHES VERSICOLOR. A synonym of **Rochea versicolor** (which *see*).

KAMBALA-TREE. *See* **Sonneratia apetala.**

KANGAROO APPLE. *See* **Solanum aviculare.**

KARATAS. According to the latest classification by Mr. J. G. Baker, this genus embraces about three dozen species. Flowers red, violet, or white; sepals free down to the ovary; petals united in a distinct tube, the segments lingulate or ovate; stamens inserted in the corolla tube, not reaching to the tips of the segments; heads usually sessile, each subtended by a bract, and the shortened inner leaves usually bright-coloured. Fruit baccate. To the species described on pp. 216-7, Vol. II., the following should be added:

K. acanthocrater (strong-spined). *fl.* purplish or bluish, in a dense head in the centre of the leaves. May. *l.* forming a dense rosette, spreading, obtuse, with spiny margins, dark green above, greyish-banded beneath; inner ones brownish-spotted. Brazil, 1885. A large species, 2½ft. to 3ft. in diameter. (B. M. 6904.) SYN. *Nidularium acanthocrater* (B. H. 1884, 9).

K. agavæfolia (Agave-leaved). *fl.* white, in a nearly sessile, central head, overtopped by the bright red inner leaves; petals half as long again as the sepals. *l.* thirty to forty in a dense rosette, lanceolate, 2ft. to 3ft. long, 2in. to 3in. broad, much narrowed to the base, armed with large, pungent prickles. Cayenne, 1853.

K. amazonica (Amazons). *fl.* white, with a greenish tube, disposed in a dense, sessile head in the centre of the rosette; bracts greenish-brown. June. *l.* rosulate, 1ft. to 1½ft. long, 2in. to 3in. broad, greenish-brown on the face, glossy claret-brown on the back, without markings or scales, the margins finely serrated. Amazons, 1870. SYNS. *Æchmea amazonica*, *Bromelia amazonica*.

K. ampullacea (pitcher-like). *fl.* about twelve in a head; sepals and bracts green; corolla blue, white at the throat. *l.* few, short, obtuse, acuminate, green, spotted with reddish-brown, especially beneath. Brazil, 1831. A distinct and pretty species, producing numerous suckers; it is remarkable for the manner in which the long sheaths of the leaves are collected into a sort of ovoid pitcher. SYN. *Nidularium ampullaceum* (B. H. 1836, p. 296).

K. antiacantha (opposite-spined). This is described as "something in the way of *K. Legrellæ*, but larger; the leaves are brownish at the base, and the bracts of a deeper

FIG. 475. KALMIA LATIFOLIA.

Karatas—*continued.*

scarlet." 1833. According to the "Kew Bulletin," 1889, however, the plant intended is "probably *Bromelia antiacantha*, which is a synonym of *B. fastuosa*."

K. Binoti (Binot's). *fl.* in a sub-sessile, central head; sepals green; petals white. *l.* fifteen to twenty in a rosette, lorate, not rigid, 9in. to 12in. long, 2in. to 2½in. broad, with a few transverse bands of paler green, rounded suddenly to a small cusp and tipped with red at apex, the marginal prickles very small. South Brazil, 1817. Plant stemless. SYN. *Nidularium Binoti*. *K. sanguinarium* only differs from this in its larger prickles.

K. Carolinæ (Caroline's). The correct name of *K. olens*. SYNS. *Bromelia Carolinæ* (R. G. 211), *Nidularium Meyendorfi* (R. G. 1859, p. 266, f. 5-8; I. H. 245). Brazil, 1856.

K. Chantrieri (Chantrier's). A garden hybrid between *K. fulgens* and *K. Innocentii*. 1895.

K. cyanea (dark blue). *fl.* violet, in a small head in the centre of the rosette. July. *l.* about a dozen, rosulate, ensiform, 1½ft. to 2ft. long, 1in. broad, firm, with distinct transverse bands of paler and darker green. Probably Brazil, 1872. Plant stemless. SYN. *Nidularium cyaneum*.

K. denticulata (slightly toothed). *fl.* dull violet, in a small head in the centre of the reduced inner leaves. *l.* ten to fifteen in a rosette, lanceolate, 6in. to 8in. long, ½in. broad, with distant, minute marginal prickles. South Brazil, 1865. Plant stemless. SYNS. *Nidularium agavæfolium* (of gardens), *N. denticulatum*.

K. digeneum (bigeneric). A garden hybrid between *K. Innocentii* and a species of Bromelia. 1893.

K. fulgens (brilliant).* *fl.* thirty to forty in the centre and a few usually in the axils of the six to ten brilliant scarlet reduced inner leaves; corolla ½in. to 1½in. long, violet, with a white tube. *l.* fifteen to twenty in a short, dense rosette, lorate, spreading, the outer ones 1ft. long, 1½in. to 2in. broad, copiously mottled with darker green, sharply toothed on the edges. South Brazil, 1849. SYNS. *Guzmannia picta* (of gardens), *Nidularium fulgens* (L. J. F. 411), *N. pictum* (of gardens).

K. guianensis (Guiana). A synonym of *Bromelia laciniosa*.

K. Innocentii foliis luteo-variegatis (having yellow-variegated leaves).* This variety differs from the type in having the leaves marked with longitudinal lines and bands of yellowish-white. 1894. (L. H. 1894, p. 73, t. 5, under name of *Nidularium*.)

K. I. striata (striated). *l.* 8in. to 12in. long, bright green, striped or striated with a central white variegation, deepening off to creamy-yellow, the margins freely furnished with small, spinose teeth. Brazil, 1883. SYN. *Nidularium striatum*.

K. Johannis (Johanni Sallier's). *fl.* white, small; inflorescence immersed in the centre of the leaves. *l.* spreading, about 1½ft. long, obtuse and channelled down the face, very pale green, slightly marbled, reddish at the apex, the margins armed with fine, distant spines. Brazil, 1835. Habit vigorous. SYN. *Nidularium Johannis*.

K. Makoyana (Makoy's). *fl.*, petals whitish, slightly violet towards the acuminate tips, free to the base; bracts green, narrow, linear-lanceolate. *l.* green on both sides, but obscurely white-banded beneath. Otherwise like *K. spectabilis*. Tropical America, 1837. SYN. *Nidularium Makoyanum*.

K. olens. The correct name is *K. Carolinæ*.

K. Paxianum (Pax's). This is closely related to *K. Innocentii*, but has white flowers, red-tipped bracts, and peculiar yellowish-green leaves. Brazil. (R. G. 1415.)

K. princeps (first). *fl.* violet, in a globose head in the centre of six to ten bright red reduced leaves. *l.* fifteen to twenty in a short rosette, lorate, about 1ft. long, 1½in. to 2in. broad, pruinose beneath, the marginal teeth small. South Brazil, 1858. SYN. *Nidularium spectabile* (of gardens).

K. p. magnifica (magnificent).* *l.*, lower ones shorter and broader than in the type, dark vinous purple; upper ones elongated, narrower, green, with bright rosy tips, lepidote beneath. 1889. Garden variety. SYN. *Nidularium princeps magnificum* (R. G. 1223).

K. purpurea (purple). *fl.* red, in a dense, central rosette, the reduced inner leaves scarcely changed in colour; corolla segments ½in. long. *l.* ten to fifteen in a short rosette, 1ft. or more in length, 1in. to 1½in. broad, more or less flushed with purple- or claret-brown, the marginal prickles minute. Brazil, before 1830.

K. rutilans (ruddy).* *fl.* vermilion-red, disposed in a contracted panicle nestling among the bract-leaves, which are of a beautiful red, shaded with rose. *l.* about twenty in a long, utricular rosette, above 1ft. long, 1½in. broad, smooth, spotted dark green. South Brazil, 1885. SYN. *Nidularium rutilans*.

K. sanguinarium (bloody). A form of *K. Binoti*.

K. striata (striated). A variety of *K. Innocentii*.

K. tristis (sad). *fl.*, sepals purplish-brown; corolla violet, with a white tube. April. *l.* ten to twelve in a rosette, ensiform, 8in. to 12in. long, 1in. broad, mottled with brown, especially towards the base, with minute marginal prickles. South Brazil, 1857. SYNS. *Nidularium marmoratum* (of gardens), *N. triste*.

KAULFUSSIA. *K. assamica* (a synonym of *K. æsculifolia*) is very easily grown; it requires a substantial mixture of two parts fibrous loam, one part peat, and one part sand, with abundance of water at the roots all the year round. It is usually propagated from spores.

KAULFUSSIA (of Nees). A synonym of **Charieis** (which *see*).

KEDROSTIS (derivation uncertain). SYNS. *Æchmandra, Coniandra, Cyrtonema, Rhynchocarpa*. ORD. *Cucurbitaceæ*. A genus embracing about fourteen species of stove or greenhouse, prostrate or climbing herbs, with perennial roots, natives of tropical and sub-tropical Asia and Africa, closely allied to *Melothria* (*Zehneria*). Flowers small, monœcious or dicœcious, the males racemose or corymbose, the females solitary or aggregate. Fruit small, baccate, ovoid, beaked, shortly pedunculate. Leaves entire, lobed, toothed, or parted. For culture of *K. africana*, *see* **Gourds.**

K. africana (African). *fl.* greenish, small, monœcious, the females solitary at the base of the male racemes. July and August. *fr.* as large as a small Olive, reddish at maturity (in September). *l.* shortly petiolate, soft and glabrous, decompound. *h.* 15ft. to 20ft. South Africa. SYNS. *Bryonia africana, B. dissecta, Coniandra dissecta, Rhynchocarpa dissecta*.

KEEL. This term is specifically applied to the two lower petals of a papilionaceous flower, which are joined into a Keel-shaped body.

KEERLIA (of De Candolle). A synonym of *Aphanostephus*. *See* **Leucopsidium.**

KEITIA. A synonym of **Eleutherine** (which *see*).

KELLAUA. A synonym of **Euclea** (which *see*).

KENDRICKIA (a commemorative name). ORD. *Melastomaceæ*. A monotypic genus. The species is a stove climber, ascending to the tops of the highest trees in its native place, and when in blossom tinging the forest red; it has been described as "one of the most beautiful of Ceylon plants." It will probably thrive under the same treatment as that recommended for **Melastoma** (to which it is allied).

K. Walkeri (Walker's).* *fl.* bright red, large, terminal, in few-flowered umbels or solitary; calyx urn-shaped; petals four, fleshy; stamens eight; peduncles stout. *l.* opposite, petiolate, oblong or obovate, obtuse, greyish-green, fleshy, distichous, pendent at the ends of the stems, which in their lower part creep like Ivy. Ceylon, 1896.

KENNEDYA. Including *Amphodus, Physolobium*, and *Zichya*. To the information given on p. 217, Vol. II., the following should be added:

K. coccinea. (B. M. 2664; L. B. C. 1126.) SYNS. *K. dilatata* (B. R. 1525), *K. inophylla* (B. R. 1421), *Zychia coccinea* (B. 120). *Z. tricolor* (B. R. 1839, t. 52).

K. Marryattæ (Mrs. Marryatt's). A variety of *K. prostrata*.

K. rubicunda. *Amphodus ovatus* (B. R. 1101) is a synonym of this species.

KENTIA. To the species described on p. 218, Vol. II., the following should be added. *K. australis* is a good species, according to the Kew authorities.

K. elegans (elegant), of Brongniart. A synonym of *Cyphophœnix elegans*. The name is also applied to *Veitchia Storckii*.

K. Kersteniana (Kersten's). This is described as a "striking-looking Palm with leaves widely pinnate, the wedge-shaped leaflets curiously erose and of a dark green tint." It is probably a species of *Ptychosperma*. 1893. (G. C. 1893, xxiv., p. 391, f. 113.)

K. Luciani (Lucian's). *l.* large, thick, coriaceous, bright green, borne on golden-yellow petioles. 1885. (I. H. 1885, t. 451.)

K. rubricaulis (red-stemmed). *l.* pinnate, ovate, borne on red petioles. 1876.

K. australis, K. elegantissima, and *K. Sanderiana* have also been introduced.

KENTIOPSIS. It is doubtful if *K. divaricata* belongs to this genus. *K. olivæformis* is in cultivation at Kew.

KENTRANTHUS. A synonym of **Centranthus** (which *see*).

KEPPLERIA (of Martius). A synonym of **Bentinckia** (which *see*).

KERCHOVEA. Included under *Stromanthe*. The plant described as *K. floribunda* is identical with **S. Porteana** (which *see*).

KEROSENE EMULSION. *See* **Insecticides.**

KERRIA, WHITE. *See* **Rhodotypos kerrioides.**

KETELEERIA (named in honour of Keteleer, a Parisian gardener). ORD. *Coniferæ*. A small genus (three species) of hardy, evergreen trees, with flat leaves and scaly buds, natives of China, included by Bentham and Hooker under *Abies*, but regarded as distinct by Dr. Masters, in his "List of Conifers and Taxads," and by the compilers of the "Index Kewensis." For culture, *see* **Pinus.**

K. Davidiana (Abbé David's). *l.* sub-distichous, 1½in. to 2in. long, ⅛in. broad, keeled below, broadly channelled above, with folded edges. *cones* long-stalked, pendent, 5in. to 6in. long, 2½in. in diameter when opened; scales slightly recurved. Branches spreading horizontally and ramifying laterally. 1873. A large tree. SYN. *Pseudotsuga Davidiana* (F. & P. 1874, pp. 124-5).

K. Fortunei (Fortune's). The correct name of *Abies Fortunei*. (G. C., March 15, 1884; J. L. S. xxii., p. 197.)

KIBATALIA. A synonym of **Kickxia** (which *see*).

KICKXIA (named in honour of Jean Kickx, author of "Flore Cryptogamique des Flandres"). SYNS. *Hasseltia, Kibatalia*. ORD. *Apocynaceæ*. A genus embracing only a couple of species of glabrous, stove trees, one Javanese, the other a native of Western tropical Africa, closely allied to *Mascarenhasia*. Flowers yellowish or greenish; corolla with five twisted lobes. Leaves opposite, penniveined. For culture of *K. africana*, *see* **Dipladenia.**

K. africana (African). *fl.* yellow, about 1in. long including the lobes, salver-shaped, numerous, in short, axillary cymes. *l.* oblong-lanceolate, 4in. to 9in. long. Western tropical Africa, 1895. A valuable rubber-tree, attaining 60ft. in its native place. Probably the plant in cultivation under this name is *K. elastica*.

KIDNEY BEAN OF MALACCA. *See* **Semecarpus Anacardium.**

KIESERIA. A synonym of **Bonnetia** (which *see*).

KILMARNOCK WEEPING WILLOW. *See* **Salix Capræa pendula.**

KING OF THE WOODS or KING PLANT. *See* **Ancectochilus regalis.**

KING OF THE WOODS, STRIPED. *See* **Zeuxine regium.**

KINKIANA. A synonym of **Cinchona** (which *see*).

KIRENGESHOMA (name of Japanese origin). ORD. *Saxifrageæ*. A monotypic genus. The species is a hairy, hardy perennial, allied to *Hydrangea* and *Philadelphus*. Probably it is not yet in general cultivation.

K. palmata (palmate). *fl.* stalked; calyx short, cup-like; petals yellow, oblong, 1in. to 1½in. long; stamens fifteen; inflorescence loosely cymose-paniculate. *l.* stalked, palmately lobed; lobes acute. Mount Ishizuchi (at 5000ft.).

KLATTIA (named in honour of F. G. Klatt, a contributor to "Flora Brasiliensis," 1840, &c.). ORD. *Iridæ*. A monotypic genus. The species is a greenhouse, bulbous plant, allied to **Aristea** (which *see* for culture).

K. partita (parted). *fl.* bright blue, ten to fifteen in a dense, oblong, terminal head; perianth tube ¼in. long, the segments 2in. to 2½in. long, with a lanceolate blade ¼in. long. April. *l.* crowded, alternate, ensiform, amplexicaul, ascending, 6in. to 9in. long, firm, closely ribbed. Stems woody, much-branched, 1ft. to 2ft. high; branches ancipitous, leafy to the top. South Africa, 1822. SYN. *Witsenia partita*.

KLUGIA. *K. zeylanica* is the correct name of *K. Notoniana* (of B. M.). The true *K. Notoniana* (of A. de Candolle) is probably not in cultivation.

KNAUTIA. Included under **Scabiosa** (which *see*).

KNEE PINE. *See* **Pinus Mughus nana.**

KNIGHT'S STAR. *See* **Hippeastrum.**

KNIPHOFIA. Torch Lily. According to J. G. Baker, upwards of thirty species are now referred to this genus. At one time it was practically restricted to kinds which were generally regarded as hardy in the southern half of England. As now understood, it embraces both greenhouse and stove species. The former require to be just kept from frost, and the latter to be treated like Strelitzias. Even the reputed hardy species are safer if covered with light litter during very severe weather. These latter include some of the showiest plants for the late spring and autumn decoration of the lawn, borders, and shrubberies. They should be planted in bold clumps and left undisturbed.

Kniphofia—*continued.*

Kniphofias vary greatly in height, 18in. or so, as in

FIG. 476. KNIPHOFIA MACOWANI.

the case of *K. Macowani* (Fig. 476), to 4ft. or more in the case of *K. aloides* and its varieties, and 6ft. in Lachesis and Monarch; but the colours are mostly some shade of yellow or red. Drought is fatal to the chances of these plants, and must be guarded against alike by copious waterings and mulching.

Many new species have been introduced of recent years, but in the majority of cases they are far inferior to the garden varieties and hybrids now so plentiful, and the best of which will be found below. Mixed seedlings are also very decorative. To those described on pp. 219-20, Vol. II., the following should be added. Except where otherwise indicated, they are practically hardy.

K. aloides glaucescens (glaucescent).* A garden variety with very large spikes of flowers. 1889. (Gn. 1889, xxxvi., p. 458.) *K. a. grandis* (Fig 477, for which we are indebted to Messrs. Veitch and Sons) is another large-flowered form. The type is well known as the Common Red-hot Poker.

K. a. nobilis (noble).* *fl.* at first red, afterwards bright orange, very numerous, disposed in a large, compact spike. July to October. *l.* dark green, 2½ft. to 3ft. long. *h.* 6ft. A robust and highly decorative garden plant.

K. a. Saundersii (Saunders').* *fl.* of an intense orange-red, disposed in ovoid spikes as much as 10in. long. *l.* 3ft. to 4½ft. long. A magnificent garden plant.

K. breviflora (short-flowered). *fl.* all yellow; perianth cylindrical, ¼in. long; raceme 4in. long; peduncle slender, terete, as long as the leaves. *l.* linear, not rigid, 1ft. to 1½ft. long, ½in. broad. South Africa, 1897. Greenhouse. Allied to *K. modesta*. (B. M. 7570.)

K. citrina (Citron-yellow). *fl.* pale yellow, in an oblong, dense raceme 2in. long; perianth sub-cylindrical, ¾in. long; stamens and style much exserted; peduncle shorter than the leaves. *l.* many, linear, 1½ft. to 3ft. long, ¼in. across, triquetrous at back. *h.* 2ft. South Africa, 1892. (Gn. 1892, ii. 861.)

K. Kirkii (Sir John Kirk's). *fl.* in a dense raceme; perianth reddish-orange, sub-cylindrical, sixteen to seventeen lines long, ¼in. in diameter in the upper half; peduncle 4ft. long, bearing

Kniphofia—*continued.*

two large bract-leaves. Winter. *l.* ensiform, 5ft. to 6ft. long, 1½in. broad low down, gradually tapering to a long point, acutely keeled. South-eastern tropical Africa, 1887.

K. longicollis (long-necked). *fl.* lemon-yellow, tinged with orange-yellow when young; perianth nearly cylindrical, 1¼in. to 1½in. long; raceme dense, short, oblong. *l.* ensiform, acutely keeled, 2ft. long, 1in. broad. Natal, 1893. A very late-flowering species. (B. M. 7623.)

K. longistyla (long-styled). *fl.*, perianth cylindrical, nearly 1in. long; style much exserted; raceme dense, finally 6in. long. *l.* numerous, erect, linear, 1½ft. to 2ft. long, ½in. to ¾in. broad. British Central Africa. Stove.

K. modesta (modest). *fl.* white, funnel-shaped, ½in. long; raceme cylindrical, dense, 6in. to 12in. long; peduncle erect, about 2ft. long. October. *l.* few in a cluster, linear, pale green, 2ft. to 3ft. long, ¾in. broad. Natal and Griqualand, 1889. (B. M. 7293.)

K. multiflora (many-flowered). *fl.* white, comparatively small, thickly disposed in spikes about 7ft. high, with long, protruding stamens. *l.* about 6ft. long, 3in. broad. South Africa, 1899.

FIG. 477. KNIPHOFIA ALOIDES GRANDIS.

K. natalensis (Natal). *fl.* mostly yellow, in a raceme 6in. to 8in. long; perianth about 1in. long. *l.* linear, 1½ft. to 2ft. long. South Africa, 1889. A rather pretty species.

K. n. condensata (condensed). Raceme denser than in the type. Scape and leaves shorter. 1895. SYN. *K. Woodii.*

K. Nelsoni (Nelson's).* *fl.* in a dense, oblong raceme, 2in. to 3in. long, all deflexed when expanded; perianth bright scarlet, with sometimes a tinge of orange, 1¼in. long; peduncle 1½ft. to 2ft. long. October. *l.* 1½ft. to 2ft. long, narrow-linear, with serrulated edges. Orange River Colony, 1892. (G. C. 1892, xi., p. 554, f. 83.)

K. Northiæ (Miss North's).* *fl.* in a very dense raceme over 1ft. long, the lower ones yellow, the upper ones red towards the tip; perianth 1in. long; peduncle shorter than the leaves, more than 1in. thick. *l.* thirty to forty in a dense rosette, lanceolate, acuminate, broadly channelled down the face. Stem short, 2in. to 3in. thick. South Africa, 1889. (B. M. 7412.)

K. pallidiflora (pale-flowered). *fl.*, perianth white, rather more than ½in. long and ¼in. in diameter, somewhat funnel-shaped, with short, obtuse lobes; raceme at first short and dense, but elongating and becoming lax as the flowers open;

Kniphofia—*continued.*

stem terete, 1ft. to 2ft. high. Autumn. *l.* 6in. to 12in. long, one line broad, semi-terete, minutely serrulated. Ankaratra Mountains, Central Madagascar, 1887.

K. pauciflora (few-flowered).* *fl.* pale lemon-yellow, less than 1in. long; perianth narrow-funnel-shaped; raceme few-flowered, 3in. to 4in. long. July. *l.* few in a tuft, linear, firm, 1ft. to 1½ft. long, acutely keeled. Natal, 1860. Greenhouse. (B. M. 7269.)

K. primulina (Primrose-yellow). *fl.* all pale yellow, in a dense, oblong raceme 3in. to 4in. long; perianth 1in. long; peduncle stout, stiffly erect, 3ft. to 4ft. long. *l.* many, ensiform, 3ft. to 4ft. long, ½in. to 1in. broad, acutely keeled. Natal, &c., 1897. Greenhouse.

K. pumila. This is sometimes called *Tritoma maroccana*, and is synonymous with *K. quartiniana.*

K. sarmentosa (sarmentose). *fl.* red in the upper half, red or tinged with red below, in a dense, cylindrical raceme 6in. to 12in. long; perianth ¾in. to 1in. long. *l.* ensiform, acuminate, 2ft. to 3ft. long, ¾in. to 1in. broad, glaucous-green, acutely keeled. South Africa. There is a hybrid between this plant and *K. aloides* (to which it is closely allied).

K. Tuckii (Tuck's).* *fl.* yellow, tinged with bright red when young, all deflexed; pedicels very short; perianth ¾in. long; raceme very dense, 5in. to 6in. long; peduncle shorter than the leaves. June. *l.* ensiform, 1ft. to 1½ft. long, ¾in. broad, tapering gradually to the apex. *h.* 4ft. to 5ft. South Africa, 1892.

K. Woodii (Wood's). A synonym of *K. natalensis condensata.*

K. zombensis (Mount Zomba). *fl.*, perianth cylindrical, narrowed towards the base, 1in. long; pedicels very short; raceme dense, 3in. to 4in. long; bracts white, with a brown keel. *l.* many, ensiform, 1ft. to 3ft. or more in length. British Central Africa. Stove.

Varieties and Hybrids. The following is a list of the best-known varieties and hybrids up to date:

AUTUMN GLORY, bright crimson; CHLORIS, apricot-yellow; CITRINA, canary-coloured; CLOTO, brilliant scarlet; CORALLINA, bright scarlet, shading to orange-red, 2ft.; CORALLINA SUPERBA, coral-scarlet, 3ft.; DIANA, rich yellow, with prominent scarlet anthers; H. CANNELL, carmine-red, 5ft.; HEROINE, pale yellow, 3ft. to 4ft.; LACHESIS, rich yellow, 6ft.; MATADOR, deep crimson; METEOR, bright yellow; MONARCH, orange-scarlet, 6ft.; OBELISK, bright yellow; OPHIR, rich orange; PAUCIFLORA-MACOWANI, intermediate between the parents suggested; PFITZERI, bright crimson, with long anthers, 4ft.; PHŒBUS, clear primrose-yellow; R. C. AFFOURIT, bright coral-red; SOLFATERRE, pale yellow; STAR OF BADEN-BADEN, yellow, shaded orange, strong grower, 6ft.; STELLA, lemon-yellow; TRIUMPH, orange-yellow, 4ft.

KNOL-KOHL. Another name for **Kohl-Rabi** (which *see*).

KNOT. A swollen joint or node.

KNOT GRASS or WEED. *See* **Polygonum.**

KOELREUTERIA. Flowers in ample, terminal, branched panicles, irregular, polygamous. Capsule rather large, inflated, three-lobed, three-valved. Leaves alternate, exstipulate, deciduous, bipinnate or impari-pinnate; leaflets opposite and alternate. This genus now embraces two species. To that described on p. 221, Vol. II., the following should be added:

K. bipinnata (bipinnate).* *fl.* bright yellow, with a purple spot at the base of the petals, resembling those of *K. paniculata. fr.* purple when ripe, broadly elliptic, 2½in. long. *l.* bipinnate, 2ft. or more in length and nearly as broad; leaflets few, each with nine or ten ovate, acute, toothed divisions. Yunnan, China, 1888. An ornamental, hardy, free-flowering tree. (Gn. 1888, ii., p. 305; R. H. 1888, p. 393, f. 93.)

K. paniculata japonica (Japanese). An interesting variety, but less hardy than the type.

KŒNIGA. *Glyce* is synonymous with this genus. To the species described on p. 221, Vol. II., the following variety should be added:

K. maritima nana compacta (dwarf, compact).* A very dwarf and compact variety; its white flowers are succeeded by an abundance of pretty berries. This is a charming subject for small borders, and can be effectively employed in carpet bedding.

KŒRNICKIA. Included under **Achimenes** (which *see*).

KÖHLERIA. Included under **Isoloma** (which *see*).

KOLBEA. A synonym of **Bæometra** (which *see*).

KOLPAKOWSKIA. A synonym of **Ixiolirion** (which *see*).

KOPSIA. To the species described on p. 222, Vol. II., the following should be added:

K. ornata (ornamental). *fl.* white, with a red centre, salver-shaped, disposed in corymbose panicles. *l.* large, oblong-lanceolate, glossy green. Ceram, 1884. A handsome shrub.

KORDELESTRIS. A synonym of **Jacaranda** (which *see*).

KOROLKOWIA DISCOLOR. A synonym of **Fritillaria Sewerzowi bicolor** (which *see*).

KORSARIA. A synonym of **Dorstenia** (which *see*).

KORTHALSIA. *Ceratolobus* (of Blume) is synonymous with this genus. The species are climbing, spiny Palms, with more or less cuneate or trapezoid leaflets.

KOSARIA. A synonym of **Dorstenia** (which *see*).

KOSTELETZKYA (named in honour of V. F. Kosteletzky, author of "Allgemeine Medizinisch-pharmazeutische Flora," &c., published in 1831-6). ORD. *Malvaceæ*. A small genus (five or six species) of stove or greenhouse herbs or shrubs, often hispid or scabrous, natives of the warmer parts of America, and closely allied to *Hibiscus*. Flowers pink, purple, or white; petals spreading or erecto-convolute; staminal column entire or five-toothed; peduncles one- to many-flowered, axillary or in paniculate, terminal racemes. Leaves sagittate or angular-lobed. Only one species calls for mention here. For culture, *see* **Hibiscus.**

K. virginica (Virginian). *fl.* pink, more than 2in. across; petals obovate-cuneate, hairy externally on one side; racemes paniculate, nodding; peduncles 1in. to 2in. long. August. *l.* cordate-ovate, acuminate, 2in. to 2½in. long, unequally serrate-toothed; lower ones three-lobed. Stem 2ft. to 4ft. high. Virginia, 1793. Hardy perennial. SYN. *Hibiscus virginicus.*

KRAMERIA. *K. lanceolata* is the correct name of *K. pauciflora.*

KRASCHENINNIKOVIA. A synonym of **Eurotia** (which *see*).

KRYNITZKIA BARBIGERA. *See* **Eritrichium barbigerum.**

KUHLIA (of Blume). A synonym of **Fagræa** (which *see*).

KUNZEA. Including *Salisia* (of Lindley). To the species described on p. 222, Vol. II., the following should be added. *K. sericea* (SYN. *Salisia pulchella*) has also been introduced, but is not in general cultivation.

K. pomifera (pome-bearing). *fl.* white or yellowish, sessile, forming dense, terminal heads. *fr.* a blue berry ½in. in diameter, crowned by the calyx lobes. *l.* ¼in. to ½in. long, variable in shape. 1889. A rigid, prostrate shrub. The fruits, which are called Muntries by the Australian natives, are largely used in jam-making. (G. C. 1889, v., p. 201, f. 36.)

KUNZIA. A synonym of **Purshia** (which *see*).

KURRIA. A synonym of **Hymenodictyon** (which *see*).

KYDIA. *K. fraterna* is now regarded as identical with *K. calycina.*

KYRTANTHUS. A synonym of **Posoqueria** (which *see*).

LABIA MINOR. *See* **Earwigs,** in present volume.

LABISIA. To the species described on p. 223, Vol. II., the following should be added:

L. alata (winged). *fl.* white within, flesh-coloured outside, small; thyrse spike-formed, axillary, 4in. to 6in. long; peduncle minutely rusty-scurfy. *l.* alternate, sessile, 6in. to 12in. long, 3in. to 4in. broad, lanceolate, obtuse, acuminate, long-attenuated at base, the margins slightly crenulate, the upper surface calcareous-green. *h.* 1ft. Borneo, Sumatra, and Malacca, 1886. (I. H. 1886, 605.)

Labisia—*continued.*

L. Malouiana (Malou's).* *l.* sub-sessile, 8in. to 10in. long, 2¾in. to 3¼in. broad, lanceolate, acuminate, velvety, dark green, irregularly marked pale green down the middle, red and purple when young; petioles very short, sheathing at base. Stem short, erect, warted, slightly copper-coloured, spotted white. Borneo, 1885. (I. H. 1885, t. 580.)

L. smaragdina (emerald-green). *fl.* pink, elegant, disposed in panicles. *l.* in a rosette, oblanceolate, obtuse, bright green. Plant nearly stemless. Borneo, 1892. (I. H. 1892, t. 160.)

LABURNUM. Including *Podocytisus.* The seed is ripe in autumn, and may be sown in light soil in spring in the open air and covered with fine soil. The seedlings should be lifted carefully, and transplanted into nursery rows, allowing sufficient room for each plant to develop. The Laburnum is a valuable tree for landscape planting, provided it is used with discretion. It looks best in groups, and if associated with the Flowering Thorn the effect is remarkably pretty.

To the species and varieties described on p. 224, Vol. II., the following should be added:

L. Adami pendulus (pendulous). A variety with drooping branches. 1871.

L. Alschingeri (Alschinger's). A synonym of *Cytisus Alschingeri.*

L. anagyroides (Anagyris-like). According to the "Index Kewensis," this is the correct name of *L. vulgare. L. autumnalis, L. bullatum, L. grandiflorum, L. monstruosum fastigiatum, L. serotinum,* and *L. tardiflorum* are forms of the common species.

LABURNUM, NATAL. *See* **Calpurnia lasiogyne.**

LABURNUM MOTH (*Leucoptera laburnella*). This is one of the *Tineidæ*, and its larva is responsible for the disfiguring blisters found upon Laburnum foliage. Apart, too, from the appearance of the trees, the general health suffers, especially in bad attacks. The Moth is a very common and an abundant one, not only in England, but over the whole of Central Europe, and being double-brooded it is capable of inflicting much damage.

The Moths are only about 8mm. in the stretch of the wings, and fly in May and again in August. Though so minute, they are delicately beautiful. The fore-wings are white, with yellow bars and spots, and elegantly fringed; the hind-wings are whitish. The body is grey, with two spots on each segment. The eggs are deposited upon the leaves, and the caterpillars hatch out in June. They quickly mine the leaves, causing spiral, blister-like blotches, which in some cases coalesce. They are green-whitish, and about ¼in. long when full-fed. The pupal state of the first brood is passed in a whitish cocoon upon the under-surface of the leaves. From these pupæ the second brood of Moths hatch out in August, and act similarly to the first brood. The pupal state, however, of this latter brood is passed beneath the food-plant, from which the larvæ descend by a cord, and the insects remain in that condition all winter, to appear as Moths in spring of the following year.

Where trees were known to be affected one season it would be a good plan to spray the food-plant with some objectionable substance in April and May. This might act as a deterrent to the females when egg-laying. Once the larvæ have mined the foliage, little can be done except pinching affected leaves between finger and thumb, or removing the foliage and burning it. The later brood may, however, be more easily dealt with by placing tarred boards beneath the infested tree and jarring it, when the insects will let themselves down by the silken threads and be readily captured. Further measures consist in removing the soil to a depth of several inches, burying it deeply, and then replacing it with fresh. Lime and soot in mixture would also prove distasteful if liberally dusted upon the soil just prior to the time when the second brood of larvæ descend for pupating.

LACÆNA. SYN. *Navenia.* Flowers rather large, loosely racemose, shortly pedicellate; lip continuous with the foot of the column; scape below the pseudo-bulbs, recurved, many-sheathed. Leaves ample, plicate-veined, contracted into the petioles.

LACATHEA. Included under **Gordonia** (which *see*), the correct name of *L. florida* being *G. pubescens.*

LACE BARK. *See* **Lagetta.**

LACE BARK PINE. *See* **Pinus Bungeana.**

LACE-LEAF PLANT. *See* **Ouvirandra fenestralis.**

LACHENALIA. Including *Brachyscypha*. According to J. G. Baker, this genus now embraces forty-two species.

CULTIVATION. One of the chief errors in the culture of Lachenalias is giving them too much heat. All that is necessary to a sturdy growth is sufficient heat to keep out frost; air should be admitted whenever favourable. A very effective way of growing these bulbs is in baskets. *L. pendula* is especially suited to such a mode of culture. An ordinary hanging wire basket should be lined at the bottom and sides with moss. Over this the bulbs may be planted, bottom upwards, and 2in. apart. Fill with good fibrous loam, putting in more bulbs just below the surface of the soil at the top of the basket. This should be done in autumn, and plenty of water should be given. The bulbs will soon grow away, and the flowers and foliage will not only cover the top of the basket, but the sides and bottom as well.

To the species and hybrids described on p. 225, Vol. II., the following should be added:

L. aurea is a form of *L. tricolor*.

L. aureo-reflexa (hybrid).* *fl.* bright yellow, the outer segments slightly tinged green, fading to reddish-brown; perianth 1in. to 1¼in. long; raceme eight- to twelve-flowered. April. *l.* two, unspotted, lanceolate, 6in. to 8in. long. 1887. A hybrid between *L. tricolor aurea* and *L. reflexa*.

L. bicolor (two-coloured). A synonym of *L. violacea*.

L. bifolia is a synonym of *L. rosea*.

L. Cammi (Camm's).* A fine garden hybrid between *L. tricolor aurea* and *L. pendula*.

L. Comesii (Comes'). This differs from *L. tricolor Nelsoni* by the outer segments being rather longer in proportion to the inner. 1891. A hybrid between *L. reflexa* and *L. tricolor quadricolor*. (R. G. 1891, p. 358, f. 77.)

L. fragrans (of A. B. R.) is a synonym of *L. violacea*.

L. lanceæfolia (lance-leaved). A synonym of *Scilla lanceæfolia*.

L. lucida is a synonym of *L. pallida*.

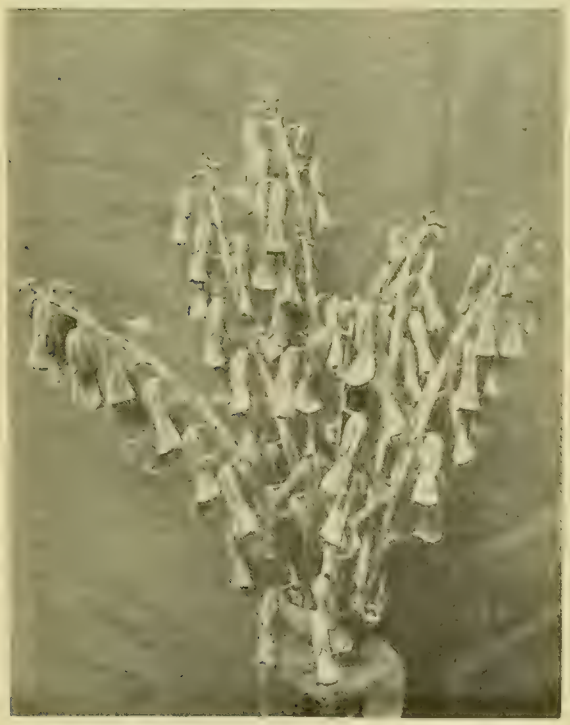

FIG. 478. FLOWERS OF LACHENALIA TRICOLOR NELSONI.

Lachenalia—*continued*.

L. Nelsoni,* described in Vol. II. and illustrated at Fig. 478, is now regarded as a form of *L. tricolor*.

L. odoratissima is a synonym of *L. pallida*.

L. pendula aureliana (aurelian).* A robust, garden variety, with large, red flowers. 1890. (R. H. 1890, p. 376.)

L. pusilla (small). *fl.* six to twelve in a dense corymb; perianth pale lilac, ¼in. to ⅓in. long; peduncle ¼in. to 1½in. long. *l.* about four, lanceolate, 2in. to 3in. long, gradually narrowed to the clasping petiole, spotted with brown or becoming reddish-brown. SYN. *Brachyscypha undulata*.

L. quadricolor is a form of *L. tricolor*.

L. racemosa is a synonym of *L. pallida*.

L. reflexa (reflexed). *fl.* all erecto-patent; perianth bright yellow, tipped green, about 1in. long, the segments being of unequal length. *l.* in pairs, recurved, 6in. to 8in. long, 1in. broad, dark green, channelled, the tissue thickening towards the tip, which becomes almost horny. 1883.

L. reflexa (of A. B. R.). A synonym of *Scilla lanceolata*.

L. Regeliana (Regel's). A garden hybrid between *L. reflexa* and *L. tricolor aurea*. 1891. (R. G. 1891, p. 356, f. 76.)

L. rosea (rosy). *fl.* all ascending; perianth bright red, ⅓in. long; raceme lax, 2in. to 3in. long; peduncle as long as the leaves. May. *l.* one or two, smooth, lanceolate, 6in. to 9in. long. This is a distinct species, and not a synonym of *L. isopetala*. SYN. *L. bifolia* (B. M. 1611; L. B. C. 920).

L. rubida Warei (Ware's).* *fl.* ten to twelve in a dense raceme; perianth 1¼in. long, the outer segments bright red at base, bright yellow in the middle, tipped green, the inner ones greenish-yellow, with a reddish-brown margin. *l.* two, 4in. to 5in. long, dark-spotted. 1884.

L. superba (superb). A garden synonym of *L. tricolor quadricolor*.

L. tigrina Warei (tiger-marked, Ware's). A synonym of *L. rubida Warei*.

L. tricolor aurea (golden). *fl.*, perianth bright orange-yellow. (B. M. 5992; G. C. 1856, p. 404, f. 176, 1872, p. 291, f. 109.) The form *gigantea* has spikes nearly 20in. high, with close upon thirty flowers. 1893.

L. t. lutea gigantea (gigantic). *fl.* of a rich orange colour, produced on a spike fully 1ft. long. 1893.

L. t. præcox (early). A variety that flowers as early as Christmas. 1889. (R. G. 1312, f. 1, under name of *L. quadricolor præcox*.)

L. t. quadricolor (four-coloured).* *fl.*, perianth having a red base and a greenish-yellow middle; outer segments tipped with green, the inner ones with reddish-purple. (A. B. R. 143; L. B. C. 746.) SYN. *L. superba* (of gardens).

Varieties. Besides the species and hybrids named, there are some excellent garden varieties, as follow:

CAWSTON GEM, yellow, tipped pink; GARNET, yellow, edged with dark red; RECTOR OF CAWSTON, deep yellow, tipped with red; RUBY, a combination of scarlet, yellow, and green; and TOPAZ, deep yellow, edged purple.

LACHNÆA. *L. eriocephala* and *L. purpurea* are now classed under **Lasiosiphon** (which *see*).

LACHNAGROSTIS. A synonym of **Deyeuxia** (which *see*).

LACHNUS. *See* **Pinus—Insects.**

LACHUZA DE PASTOR. *See* **Sonchus Jacquini.**

LACINIA. The segment of a Laciniate leaf or other body, such as the three-parted lip of an Orchid.

LACTARIA. A synonym of **Ochrosia** (which *see*).

LACTUCA. Including *Agathyrsa*. To the species described on p. 227, Vol. II., the following should be added:

L. albana (Albanian). A synonym of *L. racemosa*.

L. gigantea (gigantic).* *fl.* bluish-violet, disposed in panicles. 1889. A hardy perennial, of imposing appearance. Garden variety. SYN. *Mulgedium giganteum*.

L. racemosa (racemose). *fl.-heads* azure-blue, disposed in panicles. Summer and autumn. Caucasus, 1897. Perennial. SYNS. *L. albana*, *Mulgedium albanum*.

LADDER FERN. *See* **Nephrolepis.**

LADY TULIP. *See* **Tulipa Clusiana.**

LADY'S LACES. *See* **Arundo.**

LADY'S SEAL. *See* **Polygonatum multiflorum** and **Tamus communis.**

LADY'S SLIPPER, SOUTH AMERICAN. *See* **Selenipedium.**

LADY'S TRESSES. *See* **Spiranthes.**

LÆLIA. The following corrections of, and additions to, the information given on pp. 227-30, Vol. II., are based upon the monograph of the genus published by Messrs. James Veitch and Sons, in Part II. of their "Manual of Orchidaceous Plants." Several species formerly included under *Brassavola* are now referred to this genus.

Many of the Lælias do well under the same conditions as the Cattleyas. Some of the Mexican species, however, such as the various forms of *L. anceps*, *L. albida*, *L. autumnalis*, *L. majalis*, and others of this section, thrive more satisfactorily when grown under more exposed and brighter conditions than those usually recommended for Cattleyas. If a house cannot be set apart for the culture of this section, the plants should be placed under such circumstances that they can obtain the maximum amount of bright light, only sufficient shade being required to prevent the direct rays of the sun from scorching the foliage. Where a house is devoted to their culture, no shade whatever is required. A liberal use of the ventilators during the hottest part of the day affords free circulation of fresh air, which counteracts the scorching powers of the sun. Under these conditions the plants should be freely syringed in the morning when the conditions are favourable, and again early in the afternoon, at the same time closing the ventilators, thereby procuring a hot, humid temperature, which is essential during the growing-season. If this is done, very little fire-heat will be required, and it should only be used during the coldest parts of the night and in unfavourable weather through the summer months. As the shorter days of autumn arrive, more fire-heat will be necessary, and the overhead moisture must be correspondingly reduced. The plants require a liberal amount of water at the roots until the flower-spikes have been removed; damping between the pots on the staging and floors must be continued until this season arrives. After the flower-spikes have been removed, drier, more airy, and cooler conditions should be maintained; a temperature of 50deg. is quite sufficient during the resting period.

The plants may be grown in pots, pans, or baskets. When placed in the two receptacles last-named, they may be more easily suspended and brought up to the light, where a house is not set apart for their culture. The best season in which to re-pot the plants is when the new roots are commencing to be emitted from the base of the new growth. The potting compost should consist of good fibrous peat and living sphagnum in about equal proportions; this should be pressed moderately firm. The drainage should be ample.

L. acuminata. The correct name of this species is *L. rubescens.*

FIG. 479. LÆLIA ANCEPS SANDERIANA.

Lælia—*continued.*

L. albida bella (beautiful). The correct name of *L. a. rosea.* (W. O. A., t. 239.)

L. a. salmonea (salmon-coloured). *fl.* having salmon-red sepals and petals.

L. a. Stobarti (Stobart's). *fl.*, sepals and petals tipped rose-purple; anterior lobe of the lip bright purple.

L. a. sulphurea (sulphur-coloured).* *fl.* pale sulphur-yellow, having a light mauve hue on each side of the front lobe of the lip and dark purple marks at its base. 1884. A striking variety.

L. anceps Amesiana (Hon. F. L. Ames').* *fl.*, sepals and petals white, firm, the former having a green dot at apex, the latter feathered with crimson at the tips; lip violet-crimson, the tube yellow inside, streaked with purple, white outside, with a three-ridged, orange keel. 1883. A fine variety. The form *Thomsoniana* is similar.

L. a. Ashworthiana (Ashworth's). *fl.* snow-white, with bluish veins on the lip. 1894. (G. C. 1894, xv., pp. 84, 103, f. 10.)

L. a. Hyeana (Jules Hye-Lessen's). *fl.* white, large, having a stripe of light yellow on the disk of the lip and some purple veins on the side lobes. 1890. (L. v., t. 226.)

Lælia—*continued.*

L. a. Kienastiana (Kienast-Zölly's). *fl.*, sepals white; petals and side lobes of the lip rosy; otherwise like those of *L. a. Dawsonii*. 1886.

L. a. leucosticta (white-spotted). A variety with white or whitish-pink markings on the darker rosy sepals and petals.

L. a. munda (beautiful). *fl.*, lip having white side lobes, marked with purple veins, the yellow confined to three keels. 1886.

L. a. Oweniana (Owen's). *fl.* richly coloured, flaked with white. 1892. (J. H. 1892, xxv., p. 569, f. 77.)

L. a. Percivaliana (Percival's). *fl.*, sepals and petals palest rose-purple, suffused white; lateral angles of the lip warm mauve-purple, the anterior portion purple-magenta only at the extreme anterior third, the posterior two-thirds white; disk light orange, the tips of the three crests sulphur-yellow, the disk having some purple lines over the nerves. Mexico. (R. i. 36; W. O. A. vi. 256.)

L. a. Sanderiana (Sander's). A trifling form of *L. a. Dawsonii*; the transverse purple zone on the lip is divided into two blotches by a white area. 1885. See Fig. 479. (G. C. 1877, i., p. 281, f. 59.)

L. a. Schrœderæ (Baroness von Schrœder's). *fl.*, sepals and petals satiny-rose, the latter tipped purple; disk of the lip orange-red, with a yellow blotch on each side, the side lobes bordered with purple, the anterior one with maroon-purple.

L. a. Schrœderiana (Baron von Schrœder's). *fl.* white, with an orange disk to the lip and some crimson-purple radiating lines upon it. 1885.

L. a. Stella (star-like). *fl.* very large; sepals and petals white, stellate; side laciniæ of the lip remarkably curved, porrect, and angled, the middle lacinia long, narrow at base, dilated and often emarginate at the top, part of the base and the disk orange. 1887. (G. C. ser. iii., vol. i., p. 280.)

L. a. Veitchiana (Veitch's).* *fl.*, sepals and petals white; disk of the lip bright yellow, with brown veins, the angles of the side lobes and front part of the middle lobe purple-mauve with darker stripes. 1883.

L. a. virginalis (virgin-white). A synonym of *L. a. alba.*

FIG. 480. FLOWER OF LÆLIA ANCEPS WADDONENSIS.

L. a. waddonensis. A splendid white form, allied to *L. a. Schrœderiana.* The sepals and petals are unusually large and of good substance. The front lobe of the lip is exceptionally broad, white, becoming yellow on the disk; there are a few bright purple lines on the side lobes. 1898. See Fig. 480.

Lælia—*continued.*

L. a. Williamsii (Williams'). *fl.* white, the lip having a yellow disk, and a yellow throat distinctly striped deep crimson-purple. Winter. Mexico. (W. O. A. iv. 190.)

L. autumnalis alba (white). A pure white form. 1889.

L. Boothiana (Booth's). A synonym of *L. lobata.*

L. crispa. The correct name of *Cattleya crispa.*

L. Dayana. This is now regarded as a variety of *L. pumila.*

FIG. 481. FLOWER OF LÆLIA DIGBYANA.

L. Digbyana (Digby's). The correct name of *Brassavola Digbyana.* See Fig. 481. (B. R. 1846, 53; F. d. S. 1847, 257; W. O. A. vi. 241.)

L. Dormaniana is synonymous with *Cattleya Dormaniana.*

L. euspatha (beautiful-spathed). A synonym of *Lælio-Cattleya Schilleriana.*

L. glauca (glaucous). The correct name of *Brassavola glauca.*

L. grandiflora (large-flowered). A synonym of *L. majalis*

L. grandis tenebrosa (dark). *See* **L. tenebrosa.**

FIG. 482. LÆLIA HARPOPHYLLA.

Lælia—*continued.*

L. harpophylla. A few years ago this species was very rare: now it is somewhat common. Fig. 482 gives an idea of the habit and general aspect of the plant.

L. lobata (lobed). The correct name of *Cattleya lobata*. SYNS. *L. Boothiana*, *L. Rivieri*.

L. longipes (long-stalked). *fl.* 2in. across; sepals and petals pale mauve-purple, spreading; lip golden-yellow, rather shorter than the sepals, three-lobed; peduncles flexuous, two- or three-flowered. July. *l.* solitary, sessile, 5in. to 6in. long, narrowly elliptic-oblong, obtuse. Brazil, 1893. (B. M. 7541.)

L. Lucasiana (Lucas's). This species is closely allied to *L. crispilabia*, from which it mainly differs in having a yellow lip; the other parts of the flower are purplish-mauve. Brazil, 1893.

L. pachystele (thick-columned). This is probably synonymous with *Lælio-Cattleya elegans*.

L. peduncularis. This is now regarded as a variety of *L. rubescens*, and its correct name is *L. r. rosea*.

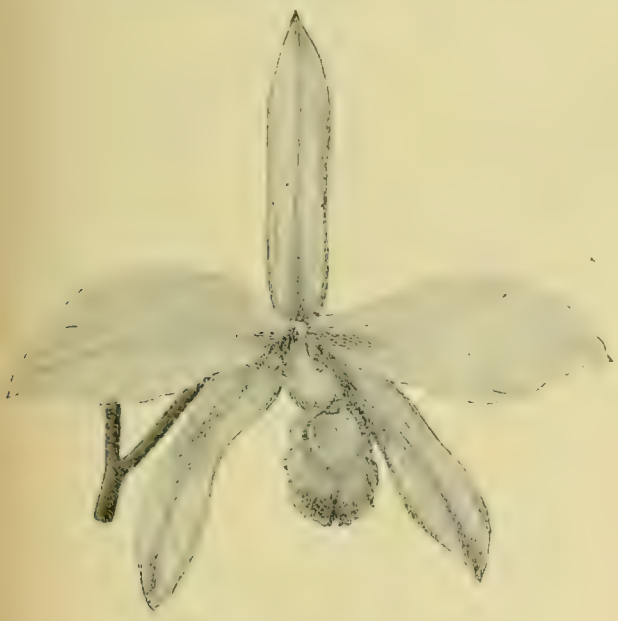

FIG. 483. FLOWER OF LÆLIA PERRINII.

L. Perrinii (Perrin's). A flower of this beautiful species, described in Vol. II., is shown at Fig. 483.

L. P. alba (white). *fl.* white, with a tinge of yellow on the disk of the lip. 1838.

L. Pilcheriana lilacina (lilac). This is merely a small-flowered form. 1886.

L. Pinelii (Pinel's). A synonym of *L. pumila præstans*.

L. præstans (excelling). (F. d. S. xviii. 1900; R. X. O. ii. 114.) SYNS. *L. Pinelii*, *Cattleya Pinelii*.

L. pumila (dwarf). The correct name of *Cattleya marginata*. (M. O. ii. 78.) SYN. *C. pumila*. There is a white-flowered form, *candida*.

L. purpurata Russelliana (Russell's). *fl.* large; sepals white, suffused lilac, rather narrow; petals slightly deeper-coloured and broader; lip rosy-lilac, large, with a band of light rose near the yellow, rose-pencilled throat. Brazil. Very rare. (W. O. A. vi. 269.) SYN. *L. Russelliana*.

L. p. Schrœderii (Baron von Schrœder's). *fl.*, sepals and petals pure white; inner surface of the tube of the lip pale ochreous-yellow, with radiating lines of deep purple, the anterior lobe mauve-purple, bordered with white. (W. O. A. i. 2.)

L. Rivieri (Rivière's). A synonym of *L. lobata*.

L. rubescens (reddish). The correct name of *L. acuminata*. (B. R. 1845, 69; M. O. iii. 81; W. O. A. iv. 163.)

L. r. alba (white). *fl.* white, with a yellow stain on the lip.

L. r. rosea (rosy). The correct name of *L. peduncularis*.

L. rupestris (rock-loving). *fl.* violet; sepals and petals oblong, acute; lip circular, the middle lobe obtuse, crisped, with straight, elevated lines; scape racemose, many-flowered. November. *l.* oblong, erect, channelled. Pseudo-bulbs one-leaved. Brazil, 1840. Allied to *L. flava*. SYN. *Bletia rupestris*.

Lælia—*continued.*

L. Russelliana (Russell's). A variety of *L. purpurata*.

L. Schilleriana (Schiller's). A synonym of *Lælio-Cattleya Schilleriana*.

L. Schrœderii (Baron von Schrœder's). A variety of *L. purpurata*.

L. tenebrosa (dark).* *fl.*, sepals and petals coppery-bronze; lip purple, of a lighter shade at the margin, darker in the throat, and having a dark blotch on either side of the disk. Bahia, 1891. Allied to *L. grandis*, of which it is by some authorities classed as a variety. (L. vii., t. 290; R. ser. ii., p. 69, t. 33; W. O. A., t. 437.) There are several named forms of this beautiful plant.

L. Wallisii is a form of *Cattleya labiata*.

L. Warneri (Warner's). A synonym of *Lælio-Cattleya Schilleriana*.

Lælias, like the closely-allied Cattleyas, have lent themselves readily to the skill of the hybridist, with the result that many charming plants have been produced. We append a list of all those recorded, with their parents, to date. Many of the hybrids which were originally described as Lælias have now been removed, and are classed under the name of **Lælio-Cattleya,** under which heading they will be found.

Hybrids.

NAME.	PARENTAGE AND RAISER.
Amœna	*anceps* and *pumila* (Ingram).
Briseis	*harpophylla* and *purpurata* (Douglas).
cinna-brosa	*cinnabarina* and *tenebrosa* (Charlesworth).
Clarinda	*Perrinii* and *pumila* (Veitch).
Digbyano-purpurata	*purpurata* and *Digbyana* (Veitch).
Edissa	*anceps* and *purpurata* (Veitch).
Euterpe	*Dayana* and *crispa* (Veitch).
Exquisite	Syn. *Juvenilis*.
flammea	*cinnabarina* and *Pilcherii* (Veitch).
Gravesiæ	Syn. *Euterpe*.
Iona	*tenebrosa* and *Dayana* (Charlesworth).
Juvenilis	*Perrinii* and *pumila* (Bleu).
Latona	*cinnabarina* and *purpurata* (Veitch).
Lucy Ingram	*purpurata* and *Perrinii* (Ingram).
Mrs. M. Gratrix	*cinnabarina* and *Digbyana* (Veitch).
nigrescens	*pumila* and *tenebrosa* (Maron).
Olivia	*crispa* and *xanthina* (Veitch).
Omen	*autumnalis* and *purpurata* (Veitch).
Oweniana	*Dayana* and *xanthina* (Sander).
Pilcheri	*crispa* and *Perrinii* (Veitch).
pulcherrima	*lobata* and *purpurata* (Sander).
Ragotiana	*grandis* and *cinnabarina* (Ragot).
splendens	*crispa* and *purpurata* (Veitch).
Yula	Syn. *Latona*.

Natural Hybrids.

NAME.	PARENTAGE.
amanda	*crispa* and *lobata*.
Crawshayana	*autumnalis* and *albida*.
Eyermaniana	*grandiflora* (*majalis*) and *albida*.
Finckeniana	*albida* and *anceps alba* var.
Gouldiana	*autumnalis* and *anceps*.
Leeana	*pumila* and unrecorded.
leucoptera	*furfuracea* and *albida*.
lilacina	*crispa* and *Perrinii*.
Lindleyana	See *Brassio Cattleya Lindleyana*.
venusta	*furfuracea* and *grandiflora* (*majalis*).

LÆLIO-CATTLEYA. These are bigeneric hybrids derived from the intercrossing of the two species *Cattleya* and *Lælia*, and through the compounding of these specific names the bigeneric name is founded. The cultural requirements are the same as those recommended for Cattleyas.

NAME.	PARENTAGE AND RAISER.
Ada	Syn. *Mardelli* (Leemann).
Admiral Dewey	*C. Warnerii* and *L.-C. elegans* (Maron).
Adolphus	*L. cinnabarina* and *C. Aclandiæ* (Paynter).
Alcides	*C. Dowiana aurea* and *L.-C. elegans* (Thornton).
Amazone	*C. maxima* and *L. purpurata* (Ingram).
Amelia	*C. intermedia* and *L. cinnabarina* (Gratrix).
Amesiana	*C. maxima* and *L. crispa* (Veitch).
amœna	*C. Loddigesii* and *L. Perrinii* (Bleu).
Andreana	*C. bicolor* and *L.-C. Schilleriana* (Maron).
Antimachus	*C. Warscewiczii* and *L.-C. Dominiana* (Leemann).
Aphrodite	*C. Mendelii* and *L. purpurata* (Lee).

Lælio-Cattleya—*continued.*

NAME.	PARENTAGE AND RAISER.
Apollonia	*L. purpurata* and *C. Dowiana aurea* (Douglas).
Arnoldiana	Syn. *eximia.*
Ascania	*C. Trianæi* and *L. xanthina* (Veitch).
Aurora	*C. Loddigesii* and *L. pumila* (Veitch).
Aylingii	Parentage unrecorded (Hollington).
Baroness Schroder	*C. Trianæi* and *L. Jongheana* (Baron Schroder).
Behrensiana	*L.-C. Schilleriana* and *C. Loddigesii* (Sander).
belairensis	*L. autumnalis* and *C. Bowringiana* (Mantin).
bella	*L. purpurata* and *C. labiata vera* (Veitch).
Berthe Fournier	*L.-C. elegans* and *C. aurea* (Maron).
Bertie Walberton	Syn. *Canhamiana.*
blessensis	*L. Dayana* and *C. Loddigesii* (Maron).
bletchleyensis	*L. tenebrosa* and *C. Warscewiczii* (Leon).
Borellii	Syn. *C. G. Roebling.*
Boweringiana-blessensis.	*Boweringiana* and *blessensis* (Maron).
broomfieldiensis	Syn. *Ingramii.*
Bryan	*C. Gaskelliana* and *L. crispa* (Cookson).
Brymeriana	*L.-C. amanda* and *C. Warscewiczii* (Brymer).
callistoglossa	*L. purpurata* and *C. Warscewiczii* (Veitch).
callistoglossa, var. *ignescens*	*L. purpurata* and *C. Warscewiczii*, var. *Sanderiana* (Veitch).
calloglossa	*C. labiata vera* and *L. lobata* or *L. crispa* (Veitch).
Canhamiæ	*C. Mossiæ* and *L. purpurata* (Veitch).
Canhamiana	*L. purpurata* and *C. Mossiæ* (Veitch).
Cappeii	*L. cinnabarina* and *C. Warscewiczii* (Cappe).
Captain Scott	*L.-C. elegans* and *C. labiata* (Leemann).
Cassandra	*C. Loddigesii* and *L.-C. elegans* (Veitch).
Cassiope	*L. pumila* and *L.-C. exoniensis* (Veitch).
Ceres	*C. Mossiæ* and *L.-C. Hippolyta*, var. *Phœbe* (Peeters).
C. G. Roebling	*L. purpurata* and *C. Gaskelliana* (Sander).
Charles Darwin	*L.-C. elegans Turnerii* and *C. maxima* (Ingram).
Charlesworthii	*L. cinnabarina* and *C. Dowiana aurea* (Charlesworth).
Cicero	*C. intermedia* and *L.-C. elegans Turnerii* (Ingram).
claptonensis	*L.-C. elegans* and *C. Dormaniana* (Low).
Clive	*C. Dowiana* and *L. præstans* (Cookson).
Clonia	*C. Warscewiczii* and *L.-C. elegans Turnerii* (Veitch).
corbelliensis	Syn. *Aurora.*
Cornelia	*L. pumila* and *C. labiata* (Veitch).
Cranstonæ	*C. Harrisonæ* and *L. tenebrosa* (Cranston).

Lælio-Cattleya—*continued.*

NAME.	PARENTAGE AND RAISER.
Cypherii	*L. purpurata* and *C. Forbesii* (Cypher).
Cythera	*L. purpurata* and *C. Trianæi* (Veitch).
Daphne	Syn. *Miss Harris.*
Decia	*L. Perrinii* and *C. Dowiana aurea* (Veitch).
Decia alba	*L. Perrinii* and *C. Dowiana aurea* (Veitch).
devoniensis	*L. crispa* and *C. guttata* (Veitch).
Diarmid	*L. Perrinii* and *L.-C. elegans Turnerii* (Ingram).
Digbyano-Mossiæ	*L. Digbyana* and *C. Mossiæ* (Veitch).
Digbyano-Trianæ	*C. Trianæi* and *L. Digbyana* (Veitch).
Dominiana (see Fig. 434)	*L. purpurata* and *C. Dowiana* (Veitch).
Doris	*L. harpophylla* and *C. Trianæi* (Cookson).
Doris, var. *xantho*	*C. Trianæi* and *L. harpophylla* (Veitch).
D. S. Brown	*C. Trianæi* and *L.-C. Schilleriana* (Sander).
Duchess of York	Syn. *Bryan.*
Duke of York	*L.-C. elegans* and *C. Brymeriana* (Sander).
Duvaliana	*L. purpurata* and *C. Luddemanniana* (Maron).
Edouard Andre	Syn. *Canhamiana.*
Electra	*C. Percivaliana* and *L. purpurata* (Ingram).
Elstead Gem	*C. bicolor* and *L. xanthina* (Ingram).
Empress of India	Syn. *Dominiana.*
Epicasta	*L. pumila* and *C. Warscewiczii* (Veitch).
Ernestii Princess Olga	*C. Percivaliana* and *L. flava* (Maron).
Ethelwald	*C. Gaskelliana* and *L. Boothiana* (*lobata*) (Paynter).
Eudora	Syn. *Aphrodite.*
Eunœa	*C. Trianæi* and *L. grandiflora* (*majalis*) (Veitch).
Eunomia	*L. Dayana* and *C. Gaskelliana* (Veitch).
Euphrosyne	*L. Dayana* and *C. Warscewiczii* (Veitch).
eximia	*C. Warnerii* and *L. purpurata* (Veitch).
exoniensis (see Fig. 435)	*C. Mossiæ* and *L. crispa* (Veitch).
Fanny Leon	*C. labiata* and *L.-C. exoniensis* (Leon).
Fascinator	*L. purpurata* and *C. Schroderæ* (Ingram).
fausta	*C. Loddigesii* and *L.-C. exoniensis* (Veitch).
Felix	*L. crispa* and *C. Schilleriana* (Veitch).
Fortuna	*C. Mossiæ* and *L.-C. elegans alba* (Veitch).
Frederick Boyle	*C. Trianæi* and *L. anceps* (Sander).
Galatea	*C. granulosa Schofieldiana* and *L. Dayana* (Charlesworth).
Gazelle	*C. bicolor* and *L.-C. elegans Turnerii* (Ingram).
Ghislainiæ	*L. harpophylla* and *C. amethystoglossa* (Maron).
G. S. Ball	*L. cinnabarina* and *C. Schroderæ* (Veitch).
Harold Morris	*C. Schilleriana* and *L.-C. Schilleriana* (Sander).
Harrisii	*L.-C. Schilleriana* and *C. Mossiæ* (Harris).
Harrisonæ-præstans	*C. Harrisonæ* and *L. præstans* (Sander).
Henry Greenwood	*L.-C. Schilleriana* and *C. Hardyana* (Maron).
Herode	*C. O'Brieniana* and *L.-C. elegans Turnerii* (Peeters).
H. Hanningtton	*C. Leopoldii* and *L.-C. Marion* (Measures).
highburyensis	*C. Lawrenceana* and *L. cinnabarina* (Chamberlain).
Hippolyta	*L. cinnabarina* and *C. Mossiæ* (Veitch).
Homere	*L. Perrinii* and *C. Percivaliana* (Ingram).
Hon. Mrs. Astor	*L. xanthina* and *C. Gaskelliana* (Sander).
Horniana	*L. purpurata* and *L.-C. elegans* (Horn).
Hurstii	*C. Skinnerii* and *L. purpurata* (Hurst).
Hycana	*L. purpurata* and *C. Lawrenceana* (Veitch).
illuminata	Parentage unrecorded (Briggs-Bury).
illustris	*L. Dayana* and *C. Warscewiczii* (Ingram).
Imperatrice de Russie	*C. Mendelii* and *L. Digbyana* (Maron).
Ingramii	*L. Dayana* and *C. Dowiana aurea* (Ingram).
Ino	*C. Loddigesii* and *L.-C. elegans* (Veitch).

FIG. 434. LÆLIO-CATTLEYA DOMINIANA.

Lælio-Cattleya—*continued.*

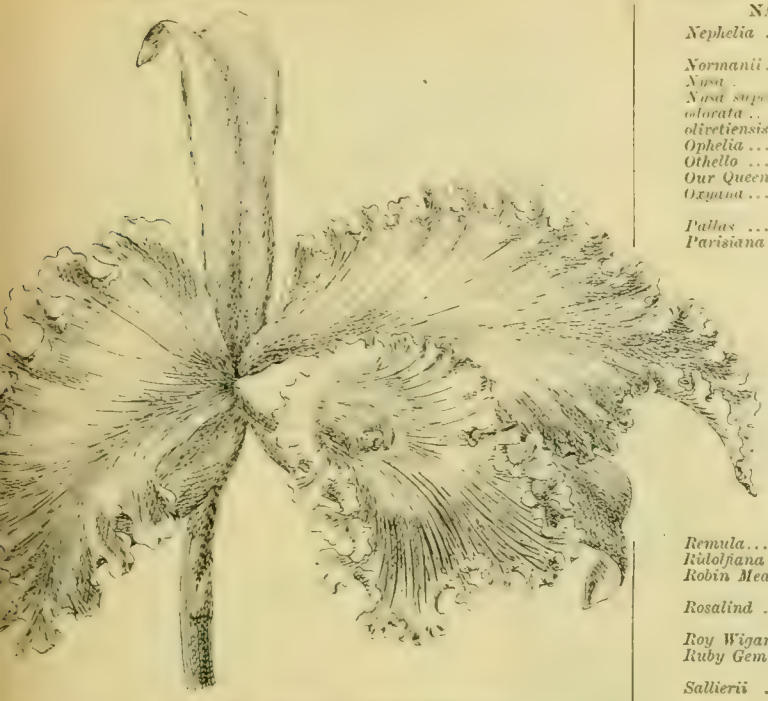

FIG. 485. LÆLIO-CATTLEYA EXONIENSIS.

NAME.	PARENTAGE AND RAISER.
intermedio-cinnabarina.	*C. intermedia* and *L. cinnabarina* (Charlesworth).
intermedio-flava	*C. intermedia* and *L. flava* (Maron).
Isabella	Syn. *Fascinator.*
Isis	*L. pumila* and *C. Marstersoniæ* (Veitch).
Janet	*C. intermedia violacea* and *L. pumila* (Lawrence).
Josephine	*L. purpurata* and *C. chocoënsis* (Chamberlain).
Juno	*C. Mossiæ* and *L. majalis* (Cookson).
Kranzlinii	*C. Mossiæ Wagnerii* and *L.-C. elegans prasiata* (Sander).
Lady Miller	*L. cinnabarina* and *C. granulosa Schofieldiana* (Miller).
Lady Rothschild	*L. Perrinii* and *C. Warscewiczii* (Veitch).
Lady Wigan	Syn. *Canhamiana.*
La France	*L. tenebrosa* and *C. bicolor* (Mantin).
leucoglossa	*L.-C. Fausta* and *C. Loddigesii* (Veitch).
Lily Measures	*L.-C. Arnoldiana* and *L.-C. Gottoiana* (Sander).
lunasta	*C. bicolor* and *L. harpophylla* (Veitch).
Lucia	*C. Mendelii* and *L. cinnabarina* (Clarke).
Lucilia	*L.-C. elegans* and *C. Dowiana* (Veitch).
Ludovaci	*C. Mossiæ* and *L.-C. elegans* (Perrenoude).
Major-General Baden-Powell	*L. tenebrosa* and *C. Lawrenceana* (Hye).
Mardellii	*C. Luddemanniana* and *L.-C. elegans* (Veitch).
Marriottiana	*L. flava* and *C. Skinnerii* (Marriott).
Martineti	*C. Mossiæ* and *L. tenebrosa* (Maron).
Massangeana	*L. tenebrosa* and *C. Schilleriana* (Peeters).
massiliensis	*L. crispa* and *C. Trianæi* (Chamberlain).
Mauve Queen	*C. Warnerii* and *L. crispa* (Sander).
Maynardi	*L. Dayana* and *C. dolosa* (Sander).
Meteore	*L. Dayana* and *C. Bowringiana* (Ingram).
Minerva	*L. Perrinii* and *C. Lawrenceana* (Ingram).
Miss Harris	*C. Mossiæ* and *L.-C. Schilleriana* (Harris).
Mulameana	*C. granulosa* and *L. crispa* (Rollison).
Myra	*C. Trianæi* and *L. flava* (Veitch).

Lælio-Cattleya—*continued.*

NAME.	PARENTAGE AND RAISER.
Nephelia	*C. Mossiæ* and *L.-C. Amesiana* (Veitch).
Normanii	Syn. *Clive.*
Nysa	*L. crispa* and *C. Warscewiczii* (Veitch).
Nysa superba	*L. crispa* and *C. Warscewiczii* (Veitch).
odorata	*C. eldorado* and *L. xanthina* (Ingram).
olivetiensis	*L. pumila* and *C. Leopoldii* (Mantin).
Ophelia	Syn. *Tiresias* (Charlesworth).
Othello	Syn. *Charles Darwin* (Ingram).
Our Queen	Syn. *C. G. Roebling* (Sander).
Oxyana	*L. harpophylla* and *C. Leopoldii* (Peeters).
Pallas	*L. crispa* and *C. Dowiana* (Veitch).
Parisiana	Syn. *eximia* (Hye).
Parysatis	*C. Bowringiana* and *L. pumila* (Veitch).
Philbrickiana	*C. Aclandiæ* and *L.-C. elegans* (Veitch).
Phœbe	*C. Mossiæ* and *L. cinnabarina* (Cookson).
Phryne	*C. Warscewiczii* and *L. xanthina* (Veitch).
Pisandra	*L. crispa* and *C. eldorado* (Veitch).
Proserpine	*L. Dayana* and *C. velutina* (Veitch).
Pytho	*L.-C. elegans* and *C. Loddigesii* (Ingram).
Radiance	Syn. *L.-C. Dominiana* (Ingram).
radiata	*L. purpurata* and *C. dolosa* (Maron).
regalis	Syn. *L.-C. Aphrodite* (Maron).
Regina	Syn. *Cicero* (Maron).
Reginæ	*L. purpurata* and *C. Forbesii* (Cypher).
Remula	*C. Aclandiæ* and *L. tenebrosa* (Veitch).
Rüdolfiana	Syn. *Canhamiana.*
Robin Measures	*C. granulosa* and *L. xanthina* (Sander).
Rosalind	*C. Trianæi* and *L.-C. Dominiana* (Veitch).
Roy Wigan	Syn. *bletchleyensis.*
Ruby Gem	*C. Lawrenceana* and *L.-C. elegans* (Ingram).
Sallierii	*L. purpurata* and *C. Loddigesii* (Maron).
Sanderæ	*L. xanthina* and *C. Dormaniana* (Sander).
Sanderiana	*L. xanthina* and unknown (Sander).
Schutzeriana	*L.-C. elegans* and *C. labiata* (Linden).
Sedenii	*C. superba* and *L.-C. devoniensis* (Veitch).
Semiramis	*L. Perrinii* and *C. Gaskelliana* (Veitch).
Sereph	*L.-C. elegans* and *C. citrina* (Ingram).
Sir William Ingram	*L. purpurata* and *C. Dowiana aurea* (Ingram).
Stanleyensis	Syn. *Ingramii* (Statter).
Statteriana	*L. Perrinii* and *C. labiata* (Veitch).
Stella	*L. crispa* and *L.-C. elegans* (Veitch).
Stella	*L. grandis* and *C. intermedia* (Thornton).
Stelznero-Hardyana	Syn. *Henry Greenwood* (Maron).
Sunray	*L. cinnabarina* and *C. superba* (Charlesworth).
Superbo-elegans	*C. superba* and *L.-C. elegans* (Maron).
Templeæ	Syn. *Mardellii.*
The Hon. Mrs. Astor	*L. xanthina* and *C. Gaskelliana* (Sander).
Thetis	*L.-C. exoniensis* and *L. pumila* (Lawrence).
Thorntonii (see Fig. 486)	*C. Gaskelliana* and *L. Digbyana* (Thornton).
Timora	*L. Dayana* and *C. Luddemanniana* (Veitch).
Tiresias	*C. Bowringiana* and *L.-C. elegans* (Veitch).
trentoniensis	Syn. *Novelty.*
Tresideriana	*L. crispa* and *C. Loddigesii* (Heath).
triophthalma	*C. superba* and *L.-C. exoniensis* (Veitch).
T. W. Bond	*C. labiata vera* and *L. purpurata* (Ingram).
Tydea	*L. pumila* and *C. Trianæi* (Veitch).
tyntesfieldiensis	*L. purpurata* and *C. Dowiana* (Hardy).
Vadaste	Syn. *aurora.*
Valvassori	Syn. *eximia.*
Varjenevskyana	Syn. *albanensis.*
Veitchiana	*C. labiata vera* and *L. crispa* (Veitch).
velutino-elegans	*C. velutina* and *L.-C. elegans* (Maron).
Venus	*L.-C. elegans Turnerii* and *L. Percivaliana* (Ingram).
Victoria	*L. crispa* and *L.-C. Dominiana* (Schroder).
Violetta	*C. Gaskelliana* and *L. purpurata* (Veitch).
vitellina	*L. harpophylla* and unrecorded (Schroder).

Lælio-Cattleya—*continued.*

NAME.	PARENTAGE AND RAISER
warnhamensis	*L. cinnabarina* and *C. Trianæi Normanii* (Lucas).
weedoniensis	Syn. *Gallierii* (Thornton).
Wellsiæ	Syn. *eximia* (Sander).
Wellsiana	*C. Trianæi* and *L. purpurata* (Sander).
Wellsiana langleyensis	*C. Trianæi* and *L. purpurata* (Veitch).
Wiganiæ	*L.-C. Gottoiana* and *C. Mossiæ* (Maron).
Wiganiana	*L. purpurata* and *L.-C. Dominiana* (Wigan).
Wilsoniæ	*C. labiata* and *L. Dayana* (Sander).
Wrigleyana	*L. anceps* and *C. Bowringiana* (Wrigley).
Yellow Prince	Syn. *The Hon. Mrs. Astor* (Leemann).
Zenobia	*C. Loddigesii* and *L.-C. elegans* (Veitch).
Zephyra	*C. Mendelii* and *L. xanthina* (Veitch).

FIG. 486. LÆLIO-CATTLEYA THORNTONII.

Natural Hybrids.

NAME.	PARENTAGE.
albanensis	*C. Warnerii* and *L. grandis.*
amanda	*C. intermedia* and *L. crispa* or *L. lobata.*
Broomiana	*L.-C. elegans* and unknown.
elegans	*L. purpurata* and *C. Leopoldii*
Gottoiana	*C. Warnerii* and *L. tenebrosa.*
Gottoiana rosea	*C. labiata* and *L. tenebrosa.*
intricata	*C. intermedia* and *L.-C. elegans.*
Oweniæ	*L. Perrinii* and unknown.
Pittiana	*G. guttata Prinzii* and *L. grandis.*
porphyritis	*L. pumila* and *C. Dormaniana.*
purpurato-intermedia ..	Syn. *L.-C. Schilleriana.*
purpurato-Leopoldii	Syn. *L.-C. elegans.*
Schilleriana	*L. purpurata* and *C. intermedia.*
verellii	*L. lobata* and *C. Forbesii.*

LÆLIOPSIS. The correct name of *L. domingensis* is *Broughtonia lilacina.*

LÆSTADIA BIDWELLII. *See* **Black Rot of Vines.**

LÆSTADIA VIOLÆ. *See* **Violet Fungi.**

LAFOENSIA. *L. Vandelliana* is the correct name of *L. microphylla.*

LAGASCEA. SYN. *Nocca. L. suaveolens* is the correct name of *L. latifolia.*

LAGENARIA. *L. virginalis* is a variety of *L. vulgaris,* having waxy white flowers. (G. C. 1892, p. 85, f. 16.)

LAGENIFORM. Shaped like a Florence flask.

LAGERSTRÖMIA. *L. elegans* (P. M. B. xiv., p. 269) is synonymous with *L. indica.*

LAHAYA. A synonym of **Polycarpæa** (which *see*).

LALLEMANTIA. To the species described on p. 231, Vol. II., the following should be added:

L. iberica (Iberian). *fl.* blue, rarely yellowish; limb small. July and August. *l.*, lower ones shortly petiolate, oblong, obsoletely repand-crenate; floral ones sessile, linear-lanceolate, obtuse. Stems erect, simple or branched below. *h.* 1ft. to 1½ft. Orient, &c., 1711. Annual or biennial.

LAMARCKIA. *Pterium* and *Tinæa* are synonymous with this genus.

LAMARCKIA (of gardens). A synonym of **Elæodendron** (which *see*).

LAMELLA. A thin plate; a small Lamina.

LAMINA. This term is applied to the limb of a sepal or petal as well as to the blade of a leaf.

LAMINATE, LAMINATED. Consisting of plates or layers.

LAMIUM. Bentham and Hooker include *Orvala* in this genus, and the correct name of *O. lamioides* is *L. Orvala. L. Galeobdolon* is commonly known as the Yellow Archangel. In addition to the two species described on p. 232, Vol. II., we may mention *L. garganicum,* which, with *L. Orvala,* may be used to clothe dry and impoverished soils where little else will thrive.

LAMOUROUXIA. The following species may be described (*see* p. 232, Vol. II.):

L. Pringlei (Pringle's). *fl.* crimson, tubular, bilabiate, 1½in. long. *l.* small, ovate, sessile. *h.* 3ft. to 5ft. Mexico, 1895. A much-branched, erect shrub. (G. & F. 1895, p. 273, f. 39.)

LAMPRA. A synonym of **Weldenia** (which *see*).

LAMPROCOCCUS. *L. Jacksoni* is a synonym of **Pitcairnia Jacksoni,** and *L. Vallerandi* is a species of **Streptocalyx.**

LAMPRONIA RUBIELLA. *See* **Raspberry—Insects.**

LAMP-WICK. *See* **Phlomis lychnitis.**

LAMPYRIS NOCTILUCA. *See* **Beetles,** and **Glow-worm,** in present Volume; and **Insects,** in Vol. II.

LANCEWOOD. *See* **Guatteria.**

LANCISIA (of Lamarck). A synonym of **Lidbeckia** (which *see*).

LANCISIA (of Pontedera). A synonym of **Cenia** (which *see*).

LANCRETIA. A synonym of **Bergia** (which *see*).

LANDOLPHIA. SYN. *Willughbeia* (of Klotzsch). To the species described on p. 232, Vol. II., the following should be added:

L. florida (flowery).* Indiarubber-tree of Tropical Africa. *fl.* white, orange-stained towards the centre, scented, shortly pedicellate; calyx small; corolla tube straw-yellow, 1in. long, the lobes 1in. long, linear-oblong, obtuse; cymes pedunculate, many-flowered. June. *l.* ample, shortly petiolate, ovate-oblong, obtuse or acute, entire, rounded or sub-cordate at base, with six to eight nerves on either side the midrib. Tropical Africa, 1878. (B. M. 6963.) A handsome climber.

LANDSCAPE GARDENING. In the formation of a garden or park there are certain rules which must guide the Landscape-gardener. These vary according to the situation, size, and purpose of the garden whose creation they are intended to control. In any case, however, good taste must prevail. A garden cannot be laid out according to a set pattern; it must be as natural as possible, and the different parts must harmonise in every detail with the environment. Advantage may be taken of the existing Landscape, and its aspect may be improved; but the general character of a situation must not be changed. All creations must remain true to natural laws. In a flat country one must not endeavour, for instance,

Landscape Gardening—*continued.*

to give to a garden a mountainous aspect by creating a rushing stream, dashing in cascades over rocks: it would be offensive to both the sight and the imagination. The Landscape-gardener must study the general aspect of the situation, the nature of the soil, the altitude, the climate, and the local vegetation. He must think what will be the aspect of his creation thirty or forty years hence, when the trees will be in the fulness of their development, in order to be able to judge of the correctness of his conceptions. Full attention must be devoted to the views which may be commanded over the neighbourhood, or in the garden or park itself. Everything which he considers pleasant and picturesque—as, for instance, a view of a church, a ruin, water, or any agreeable feature of a landscape—must be utilised to the best advantage. He can heighten the effect of such views by directing the line of sight between narrow openings amongst trees. The area of a garden may be made to appear larger than it really is, and boundaries may be so dissimulated that the garden may appear to embrace the whole of the surrounding Landscape. The boundary walls and fence may be clothed with Ivy: hedges may be kept low; or again, they may be set in a ditch so as to be completely hidden when viewed from a certain distance.

The gardener should bear in mind that trees serve to frame the view, and give, by the variation of their

Landscape Gardening—*continued.*

forms and colours, light and shade to the picture. By these helps the lines of sight may be broken, thus imparting life to a Landscape, and preventing even the most beautiful views from becoming monotonous. In some cases a view hidden by trees may be brought into sight, while at the same time the most charming effects may be created, by making openings amidst the trees by cutting down branches, or, when necessary, by altogether removing the trees which intercept the view. If recourse be had to the latter expedient, the gardener must make sure before sacrificing a tree that the general aspect will benefit thereby, as any mistake in that direction cannot afterwards be easily rectified; he should well consider, too, the number of years a tree takes to attain its full development.

The choice of a site for the house in respect to the points of the compass is of the greatest importance. It must come before every other consideration; it must even take precedence of the view, as the comfort of the dwelling, which must never be undervalued, depends largely on its aspect. It is not easy to state the best position to meet every case; but, all things considered, perhaps a south-easterly one presents the most advantages. A house facing the south on that side gets too much sun in the summer, while the side facing north gets none in the winter. With a south-easterly position, however, every side gets the benefit of the sun. Fig. 487 gives the plan of a country residence, embodying the usual accessories.

The gardener has also to consider the approaches in their relation to public roads leading to, say, the railway-station, the post-office, or the church. They must appear to lead as directly as possible to the intended points.

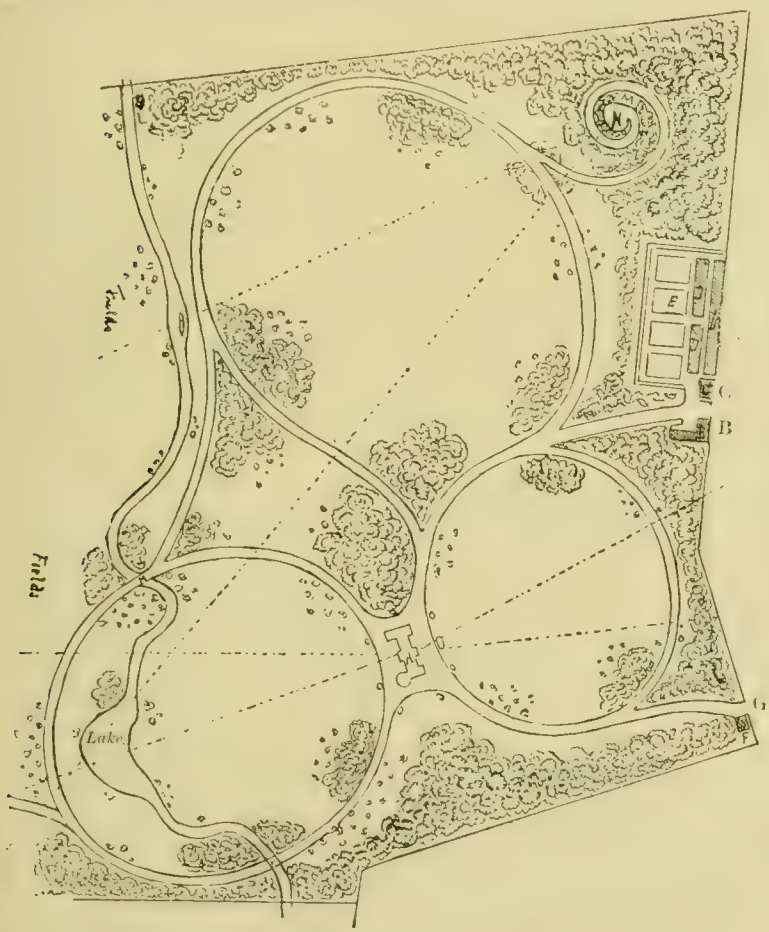

FIG. 487. PLAN OF A COUNTRY RESIDENCE.

A, Mansion; B, Stables, close to the servants' entrance, hidden from the Mansion by thick plantations; C, Gardener's Cottage, opposite to the Stables; D, Greenhouses, one lean-to and two span-roof houses; E, Kitchen Garden, surrounded by walls, against which are trained fruit-trees; F, Lodge; G, Main Entrance; H, Bridges; I, Water Pump and Engine House; M, Reservoir; N, Summer-house. (The dotted lines are the lines of sight.)

PRELIMINARY OPERATIONS. When the formation of a garden has been decided upon, the first operation will be a careful study of the ground, with the plan of the site at hand. If such a plan does not exist, one must be made before any other work can proceed. The plan is taken off after the manner adopted by surveyors. It is not proposed here to go into a detailed description of this operation. Suffice it to say that, in the ordinary way, a line is first staked which will serve as a working-base. From this line the surface is measured out, transforming it, according to requirements, into squares, trapeziums, and triangles, and the results are taken note of, and drawn. The situation and area of any existing buildings, the exact position of the trees, &c., must all be noted. When this has been done, the levels of the ground have to be similarly dealt with, sections being taken of the principal parts of the area, both longitudinally and transversely; well-defined figures of the lines followed by the surface of the ground being thus obtained.

The best position for the house, if it has to be erected, must be fixed in relation to the point of the compass, the outlook, the natural shelter, the surrounding views, and the height of the situation. The conveniences of communication with the neighbourhood, the form and the nature of the soil, and the sites of the various buildings which it is intended to erect, have all to be considered. The natural advantages of the situation, which will

Landscape Gardening—*continued.*

facilitate the creation of picturesque effects, will have to be well studied, as well as the best methods of remedying any defects.

TRACING. The necessary appliances required for tracing the design of the future garden or park are an optical square, a chain, a rule, a garden line, and some sticks and pegs. With the pegs will be marked the positions of the buildings, trees, &c., the outlines of the alleys, water, and beds, and the heights of the levels of the earthwork to be thrown up. Two different kinds of pegs will be required: (1) Long poles to indicate the positions of the buildings to be erected; (2) Pegs 2ft. long, 1½in. to 2in. square, thick, and pointed at one end, for marking the outlines. The sticks should be as straight as possible, 3ft. to 4ft. long, with a slight slit in the centre of the top. In this should be inserted pieces of white paper; these are used for tracing the lines of sight and are the bases to work upon in the general tracing.

The outlines of the house have first to be traced as exactly as possible, the situation of the principal rooms being marked, as according to their disposition the lines of view will have to be arranged. The greatest number of lines of view will be concentrated at the centre of the principal front. From these points the gardener must start to stake, taking, one after the other, the different objects which it is decided to include in the picture—such as a church steeple, a ruin, water, rockery, &c. Sometimes these views may be hidden by trees, through which openings will have to be made, or by other obstacles, which will likewise have to be overcome. Their positions will be found on the plan by taking the angle formed by two lines, of which one will mark the future opening, and this will then be noted on the ground by the aid of the compass.

The different views and aspects, regarded from other parts of the garden or park, must afterwards be fixed with exactness. For this purpose the lines used and marked on the plan of situation will be reproduced on the ground, and with some perpendiculars and angles measured and traced from them the gardener will arrive at the required situation. The start and the direction of the view will then be found. In fixing these lines of sight the peculiarity of the angle of sight must be taken into consideration. The object to be set in view must be seen in all its width: it must not be concentrated into a narrow opening; such an opening must be wider at its extremity than at its start, close to the point of observation. If the view is to be reciprocal—that is,

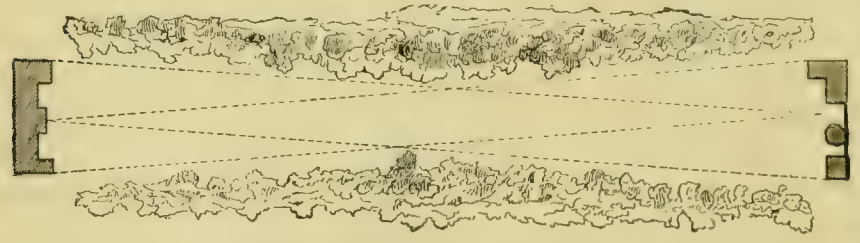

FIG. 488. DIAGRAM OF RECIPROCAL VIEW.

if the two ends become each in turn top and base of the triangle—the opening must not be bounded by two parallel lines, but must be managed as shown in Fig. 488.

The outline of a lake, river, &c., must be pleasing, and in harmony with the situation. Very often the agreeable forms given to creations on paper will have to be altered on the ground. It must be remarked here that a curve appears much more accentuated when traced on the ground. It will be well, after the principal points of the lake have been determined, to join them by inserting intermediate pegs at short distances from each other, say every 14ft., or every 6ft. when the curves are short.

The tracing of the alleys is most important, as it is in fact the reproduction on the ground of the design of the garden. The tracing of an avenue or of a straight alley,

Landscape Gardening—*continued.*

or, indeed, of any other straight line which may occur in the design of a garden, is such an easy operation, that it hardly requires any description. The extremities are fixed, and intermediate pegs inserted upright in the line at equal distances. The curved lines are more difficult to trace. Geometrical curves may be calculated and traced with invariable precision, but generally speaking they only occur in geometrical or formal gardens, or in flower-beds. In the tracing of gardens or parks, one has generally to deal with fantastic curves with long, sweeping lines, and contra-curves with ever-changing centres. Their execution requires great practice, as they are traced by sight, without the help of any instrument. Their outlines, so long as they are pleasing, do not require to be traced with mathematical precision. Though this could be obtained, it would entail considerable trouble and great loss of time without giving any appreciably better result.

We will begin by demonstrating the principle employed in tracing a regular curve with only one centre, an operation which may be done in two different ways. In

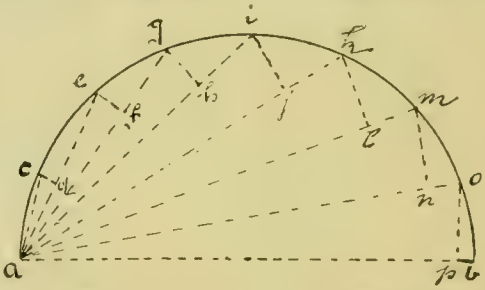

FIG. 489. TRACING A CURVE FROM A FIXED POINT.

the first, shown at Fig. 489, the worker stands at *a*, and directs the operation without moving from that spot. The pegs are set at equal distances, and the *apparent* interval between them increases with the distance from the point *a*. The represented curve is divided into eight parts, and the apparent distance between each peg, as seen from *a*, will be respectively *cd* for *ce*, *ef* for *eg*, *gh* for *gi*, &c.; that is, the intervals seen between those pegs are equal to the lengths of the perpendiculars *dc*, *fe*, *hg*, &c., erected on the straight lines *ac*, *ae*, and *ag*. From the point *a*, situated on an eminence, the worker could see all the different points of the curve, whereas, if he were standing in a hollow of the ground, one part would be hidden.

By the second method the curve is traced by what is known, in French, as *cheminement*, and differs from the first in that the operator, instead of directing the work from one point, goes forward as it proceeds. It is based on the principle that if the perimeter of a circle is divided into equal parts the abscissæ are all equal to each other. In Fig. 490 the curve is equally divided in *a*, *c*, *e*, *g*, and *i*; the abscissæ of the chords Ac, *ae*, and *cg* will be equal to *ba*, as all the arcs of the circle are equal to each other. Starting at the point A, the operator has the pegs at *a* and *c* inserted, and notes the length of the abscissa *ba*, keeping it in mind. Going forward to *a*, he has the peg *e* inserted, reproducing in *dc* the length of the abscissa *ba*, and so on. Irregular curves, with several centres, are those which occur most frequently in tracing a garden; they are also traced by *cheminement*, as just explained.

Fig. 491 represents a parabolic curve equally divided. In working gradually forward from *c'* to *d'* it will be seen that the abscissæ *e'e*, *f'f*, and *g'g*, gradually lengthen,

Landscape Gardening—*continued.*

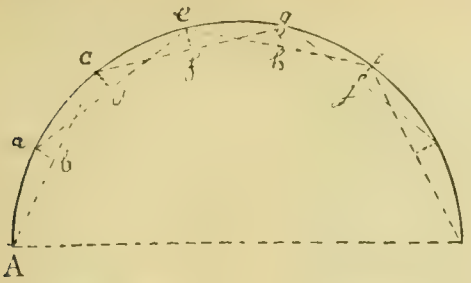

FIG. 490. TRACING A CURVE BY CHEMINEMENT.

and that the flatter the curves the shorter they become. The operator, therefore, as he proceeds, must remember

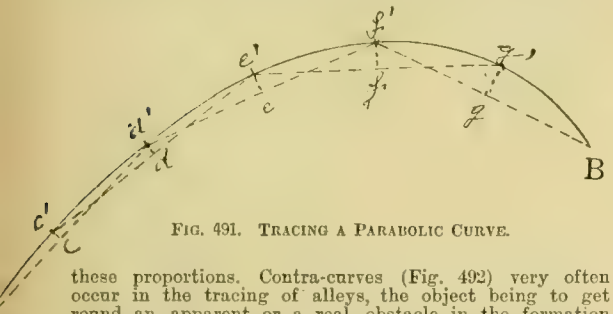

FIG. 491. TRACING A PARABOLIC CURVE.

these proportions. Contra-curves (Fig. 492) very often occur in the tracing of alleys, the object being to get round an apparent or a real obstacle in the formation of the ground, such as a rock, &c. In such a case the gardener has to trace first one curve and then the other, with the same proportions, taking care that no breach of the line occurs at F.

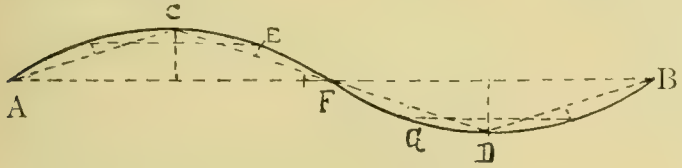

FIG. 492. TRACING A CONTRA-CURVE.

In tracing an alley it is usual to first insert pegs at a considerable distance from each other; say, every 60ft. Some workers trace first one side of the alley and then

Landscape Gardening—*continued.*

the other, but it is preferable to trace the axis first, as it will afterwards be easier to effect a harmonious junction of the different alleys. The axis traced, it is usual to go over the work again, correcting the defects. Two men take a rod, equal in length to the width of the proposed alley, and mark its centre. They stop at each peg and set the rod at right angles to the axis, while a third man holds the mark just on the axis, and a peg is then inserted at each extremity of the rod, marking exact points in both sides of the alley.

Fig. 493 represents a correct junction (formed when the axes have been first traced), in which the alleys converge well at their point of junction, so that when the sides have been traced it is only necessary to round the

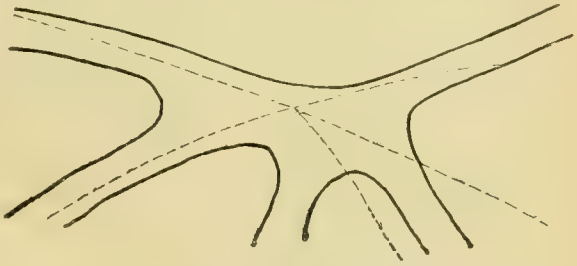

FIG. 494. DEFECTIVE JUNCTION OF ALLEYS.

angles. In Fig. 494 is shown a defective junction of alleys (a result easily obtained when one side of an alley has been first traced, and then the other), where the different axes do not meet well.

When the general tracing has been done, and the defects have all been corrected, some intermediate pegs on the sides are inserted 15ft. from each other, and driven well in. Those marking the axis are then taken out. Pegs marking the outlines of beds, in order not to be confused with those marking the alley, must be painted at the top or else inserted in an inclined direction. In gardens the outlines of beds bordering an alley must be strictly parallel to them; but the sides facing the lawn may be irregular.

Practical methods for tracing on the ground symmetrical designs, with the help of instruments, are numerous; but the following simple rules will enable those who do not possess the latter, and are not accustomed to their use, to obtain a similar result simply with the aid of a garden line and a few pegs.

(1) To trace with the line a straight line perpendicular to another straight line (Fig. 495): On the line AB two

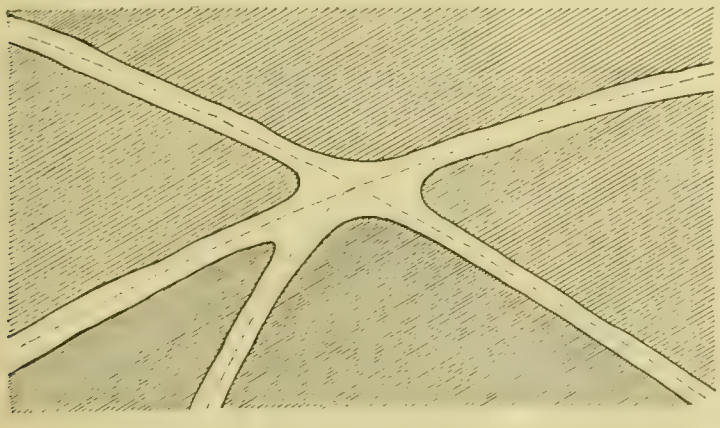

FIG. 493. CORRECT JUNCTION OF ALLEYS.

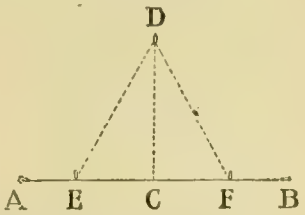

FIG. 495. TRACING WITH A GARDEN LINE A PERPENDICULAR AND AN EQUILATERAL TRIANGLE.

pegs are inserted at E, F, at equal distances from the centre (C); nooses, formed at each extremity of the garden line, are passed over E and F, and in the middle of the line a knot is made. By holding the line at D and tightening it, DC, the

Landscape Gardening—*continued.*

perpendicular to AB, is found. A similar result may be obtained by tracing a circle from each extremity of the line AB with radius EF. The two arcs of the circles will meet in D, from which the perpendicular to AB may be traced to C. This latter method may be used to advantage on a flat surface, while the former is preferable on uneven ground.

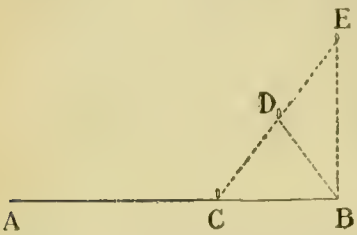

FIG. 496. TRACING WITH A GARDEN LINE A PERPENDICULAR AT THE EXTREMITY OF A STRAIGHT LINE.

(2) To trace a perpendicular at the extremity of a straight line (Fig. 496): In the line AB a peg (C) is inserted anywhere, and the nooses of the garden line are passed over the pegs B, C. These are drawn tight till the knot made in the middle gives the point D, where another peg is inserted. The noose over the peg B is then taken off, and by putting it in a line with DC the extremity of the garden line will give the point E, the line from which to B is perpendicular with AB.

(3) To trace on the ground an angle or triangle (Fig. 497): A line (AB), in this case 20ft. long, is measured. Then a garden line, 20ft. long, is fastened at A, and another, 8ft. long, at B. Both free ends are joined together, and the point C is found, giving the apex of the triangle. When the triangle is to be equilateral, it can be traced by Example No. 1, used to find the perpendicular, or by this method with lines of equal length.

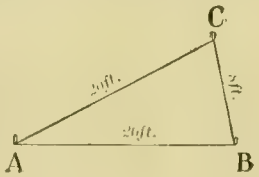

FIG. 497. TRACING A TRIANGLE.

(4) To trace with the garden line a rectangle (Fig. 498): At B in the line AB, 20ft. long, for instance, a perpendicular (BC), 8ft. long, is traced. Another line, 20ft. long, is fastened at the peg at C; and a third one, of 8ft., at the peg at A, both ends being joined in D.

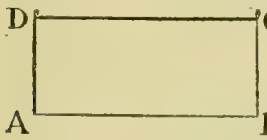

FIG. 498. TRACING A RECTANGLE.

(5) To trace with a garden line a regular polygon: say Fig. 499, representing a pentagon, ABECD, is to be reproduced. The line AB and the line AC are measured; with these measures the triangle (ABC) may be traced by Example shown at Fig. 497. Two lines, equal in length to AB, are fastened by one end in A and in C, and by joining the other ends together the point D is found, while, proceeding similarly on the other side, the point E is found.

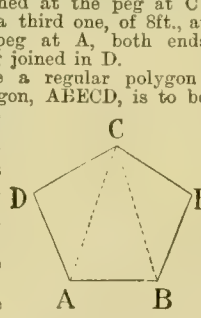

FIG. 499. TRACING A REGULAR POLYGON.

(6) To trace with a garden line a circle or an arc of a circle: A peg is placed in the centre, and the noose of a string, equal to the radius (the half of the diameter), is passed over it, the tracing being done by moving round with a stick fixed at the other end of the tightened string.

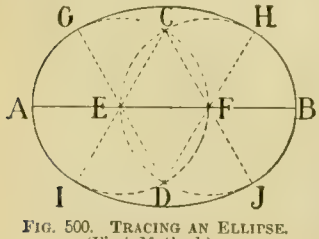

FIG. 500. TRACING AN ELLIPSE. (First Method.)

(7) To trace an ellipse, of which only the major axis is known (Fig. 500): The line AB is divided into three equal parts at E and F. With the length of one of those parts as radius, and the points E, F, as centres, two circles are traced, of which the circumferences cut each other in C and D. From C, two diameters of the circles are traced, of course passing through the centres, E, F, and meeting the circumferences in I, J. A similar operation is performed from D. From the point C as centre, and the diameter CJ as radius, the two circles are joined by an arc, which will meet them in I and J, and this may be repeated from D at GH. Another way: The major axis (AB) being given (Fig. 501), at rather less than a third of that line from the end, a peg is inserted as at C. That distance is measured from B, and a peg inserted at D. A string is fastened at C and D, and put loosely over B. Then a stick (E) is put in the loop, and moved round the foci C and D in one direction, the string being kept taut. This is by far the easiest method to practise on a large scale.

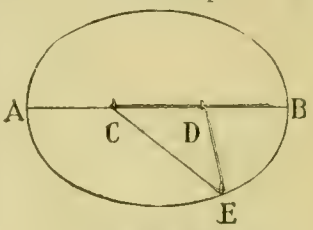

FIG. 501. TRACING AN ELLIPSE. (Second Method.)

(8) To trace with a garden line an ellipse of which the major and minor axes are known (Fig. 502): The major axis AB is divided in E into two equal parts by the minor axis CD; taking the half of CD, and measuring it on AB, will give AF. FE is then divided into three equal parts, of which one is measured in G on FA. The length AG is then also measured on BE, giving the point H. With the garden line two equilateral triangles are traced according to Example 3, having as common base GH, and as apices I and J respectively, the sides being produced. With GA as radius, the arc KAL, and with HB, the arc MBN, are traced. The ellipse is then completed by tracing two other arcs having as centre I and J, and touching the previously-traced arcs at the points L, K, M, and N.

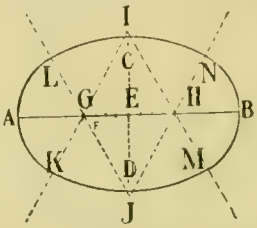

FIG. 502. TRACING AN ELLIPSE. (Third Method.)

With these examples most of the plain figures of a geometrical garden may be traced, even if the gardener has no other instruments at hand than line and pegs.

The tracing of orchards and fruit and kitchen gardens is, as a rule, very easy. The right angle is the dominating feature, and great care must be taken in well fixing the axes and their perpendiculars. When the tracing of a regular garden has to be executed on very inclined ground, it must be done according to the horizontal plane. The principal point of the tracing, and especially the lines of operations, will have to be fixed by stretching garden lines well tightened in a horizontal direction, while with the plumb the exact places for the pegs are indicated. The pegs or poles used must be of such a length that a part may be left in sight till all the work is done, even if the other part should be hidden by the filled ground.

LEVEL. When the tracing has been executed, the points of level which will have to guide the formation of the earthwork have to be fixed. In the scheme of transformation, the levels fixing the different gradients of altitude, and describing the original lines followed by the surface of the ground—obtained when taking off the plan of situation, and when making the study of the ground—have been altered or rectified.

The principal points of level are fixed with a theodolite or with a water-level, and the intermediate points with borning-rods. The last-named consist of three pieces of wood, 4ft. long and 2in. wide, with a strip of board placed exactly at right angles across their tops. They are used in the following manner: Given two points of level the operator, with the help of two men, sets his rod on one point while a man holds his upright on the other point. The second man holds his in the line at the intermediate point. The operator then looks

Landscape Gardening—*continued.*

over the top of the little board, and if he sees the top of the other two in even line, the level is obtained; while if he sees the second higher or lower than the third, it has to be lowered or raised accordingly.

Where the soil has to be removed, a hole is made, and a peg inserted at the bottom and sunk to the right level; its top may be painted red. If, however, soil has to be brought to that place—that is if the level of that particular spot has to be raised—the peg will have to be painted on three sides only, the fourth being utilised for marking the height of the future level above the original soil.

APPROACHES. The ways of communication determine more than anything else the style of a garden. The principal points for consideration, in laying out approaches, are not numerous, but they are of the utmost importance. The communications between the entrance from the public road and the house, and between the latter and all other parts of the place, must be as convenient and as easy as possible. Their appearance must be harmonious and in accord with the style of the garden. They should always appear to lead direct to their destination, and any deviation should only arise from a decided obstacle. Approaches must be solidly established and well kept.

The different ways of communication in a park or a garden are as follow: The drive, which may be straight or curvilinear; the walks, which may also be either straight or curvilinear, according to the style of the garden; and the paths and back road for the service of the house, of the garden, and of the stables.

THE DRIVE leads from the public road to the residence. If the estate is a large one, and the house is of pretentious appearance, and situated in flat country, a straight drive is advisable; but if the ground is undulating, a curvilinear drive is more appropriate. A straight drive, though imposing, is monotonous. A straight avenue must start from the centre of the house, and put the latter into relief. When the centre of a residence is not prominent or particularly decorative, two avenues may start from each of the extremities of the front, each one becoming a centre. The space between the two avenues must on no account be planted with trees, though it may be turfed, and be brightened with flower-groups. The number of rows of trees on each side of an avenue may vary from one to four. If more rows than one are planted, they may be arranged in either squares or chequers.

A drive with one or several curves is best adapted—in fact, the only suitable one—for undulating ground; and it has to be closely studied after the site of the house has been chosen. The site of the entrance from the public road must be determined according to the exigencies of the situation and the proprietor's needs. If a curvilinear drive is chosen, it must, nevertheless, not deviate too much from the straight line. The entrance thereto must be as near to the house as the natural conditions will allow. The curves must be easy, forming broad, sweeping lines. Every change of curve must have its apparent reason—*i.e.*, an obstacle, such as a tree which it is desired to conserve, a rock, or a wooded hill, which has to be allowed for. To increase the variety of a long drive, such "obstacles" may be artificially created. The more undulating or hilly the ground, the more numerous must be the turnings, and each sweep of a curve must be hidden from the succeeding bend. The entrance from the public road must, if possible, be at right angles with the latter; and the commencement of the drive from the public road, and also the house end, must be nearly level. The entrance ought not to be situated on a higher level than the house. The slope of the drive must, if possible, be regular, even, and continuous all the way along, except at the ends. It must not go up and down hill if this can be avoided, unless water has to be crossed or a hill to be turned.

The gradient of a good drive must not exceed one in fourteen, and its width must be at least 14ft., so as to permit of two carriages passing each other. There must not be an open view of the house at the entrance of the drive; the house must only be seen from the points at which it will appear to its best advantage, through occasional openings between groups of trees.

Trees bordering such a drive must not be planted at regular distances, as that would prove monotonous. They must be skilfully arranged in groups at alternately varying distances.

A proper treatment of each end of the drive is of great importance. The custom in England differs from that of several continental countries—France in particular. In French gardens the drive very often divides, almost from the start, into branches, which go round a large lawn and meet again in front of the house, the general aspect remaining constantly similar. There is only one curve on each side, forming round the lawn a kind of regular track of a fairly decorative appearance when well treated, but still presenting—as M. Ed. André, in his famous work, "L'Art des Jardins," deplores—many serious defects, of which the principal is the uniformity of design. He says that the result of an invariable model applied to the most varied circumstances is to reduce the design to an artificial and inartistic proceeding, though he does not intend to proscribe the bifurcated alley when applied to

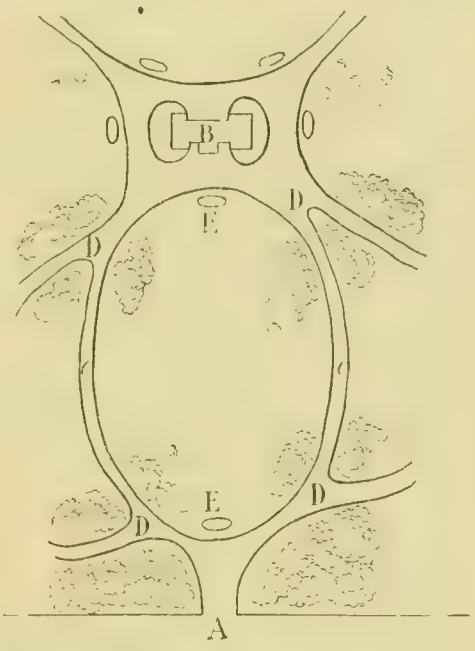

FIG. 503. APPROACH IN FRENCH GARDENS AFTER ANDRE.

a suitable situation. Fig. 503 illustrates this type. The entrance (A) is opposite the house (B). The drive divides into the branches (C, C). The crossway (DD) is surrounded by groups of trees and shrubs. The elliptical lawn is undulating; the centre has been lowered and the verges have been raised. Beds (E, E) are planted with flowers, and trees are scattered about in various places.

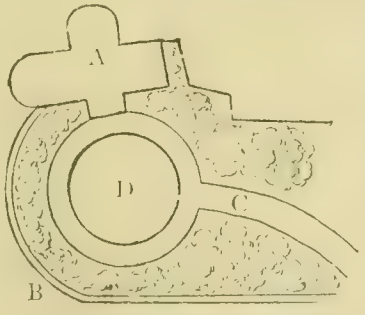

FIG. 504. APPROACH AFTER MACINTOSH.

Everywhere regularity, with an apparent variety of aspect, prevails.

As a rule in French gardens the drive goes round the house; while in England this is not the case. The drives are not divided, but usually end in front of the house, there forming a narrow ring. The interior of the garden or

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park is hidden either by sinking the carriage-drive, by raising banks along the garden, or by planting; therefore, the space in front of the house must be large enough to permit of carriages making a circuit as easily as possible—say not less than 30ft. for a small house, or 100ft. for a large one. There must also be enough space on either side of the porch to allow carriages to draw close to the steps. Fig. 504, after MacIntosh, represents a house (A) confined on the side of the entrance in a narrow space by a wall (B). The drive (C) skirts a circular turfed space (D). Both sides are planted with compact groups of shrubs. In Fig. 505 there are two big groups (E, F) at the entrance, and a third at G; the house is hidden by those groups without being itself deprived of air or of view. The last two examples are only suitable for small gardens. Fig. 506 shows a good design of drive (A), a bad one being shown by the dotted lines (B).

FIG. 505. APPROACH AFTER HUGHES.

THE WALKS AND THE PATHS, like the drive, are governed by a very few general rules, though they present a great variety of forms. They must lead in a natural and agreeable way to any place of interest—say, to one commanding a good view over the country, or having itself a picturesque aspect: to a tree, to some water, or to a playground. Alternate curves are a necessity, as they enable one to view an object under different aspects, but their number must not be greater than is strictly necessary. On hilly ground the curves and turnings will have to be more numerous. The width of a walk is, as a rule, 8ft., and of a path 4ft. Their edges must be kept strictly parallel, and must never be crooked, as they are sometimes seen in gardens.

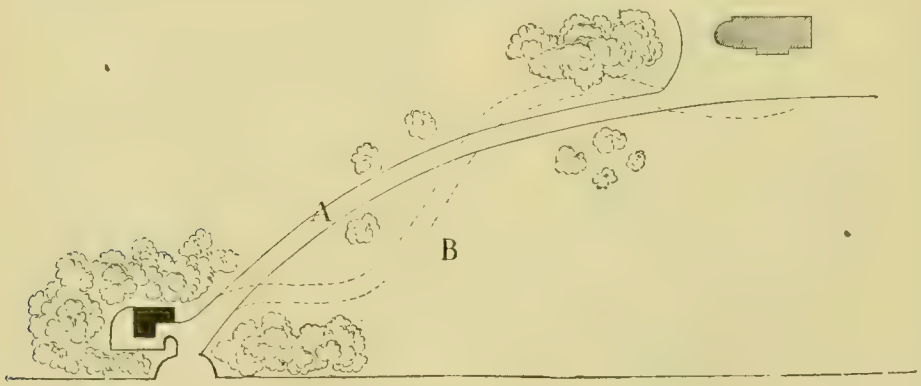

FIG. 506. GOOD (A) AND BAD (B) DISPOSITIONS OF AN APPROACH.

Two or more walks and paths need not in their forms follow definite shapes, as the delineation of such would be hidden by the plantations. One alley must not run into another at right angles, but their axes, as before stated, must join harmoniously. It must (Fig. 507) join obliquely after such an angle that the direction of B may be taken naturally, but at the same time one should also be able to turn with ease towards C if one chooses to take that direction. When an alley (A) divides, each of the two branches (B and C) must take at once a decided opposite direction in order not to leave any doubt about its destination (Fig. 507). Such a disposition as that shown in Fig. 508 must be avoided. The

Landscape Gardening—*continued.*

separation is seen at once to be unnecessary, as the two branches show that they will meet again at a short distance.

In the formal garden the alleys not only characterise but create the kind of garden. Their turfed grass borders, flower-beds, terraces, &c., must be in strict harmony with the architectural lines of the house, and the former must have their axes in common with the latter. There must be a marked delineation of the limits of the formal and the Landscape Garden, in the form of balusters, steps, or banks.

FIG. 507. GOOD BIFURCATION.

If the formation of the drives, walks, and paths is very carefully attended to, it will afterwards be much easier to keep them in good order. The lines forming the widths of the drive must be well defined, and that width dug out. The depth of the depression and the thickness of the road material depend on the use to which the road is intended to be put. A main drive, on which there is likely to be a lot of carriage traffic, must be made as solid, and maintained in the same condition, as a public road; it will require a layer of broken stones or rough gravel 6in. to 10in. thick. Other kinds of porous material, in the form of broken bricks, clinkers, or burnt ballast, may be first employed, and these may be covered by a thin layer of the first-named material. A drive 14ft. in width should have a "crown" of 3in. The materials named must be well rolled down, and watered at the same time, in order to get them to bind well. The weight of the roller to be used depends on the thickness and quality of the road material employed, the slopes of the ground, and the number of horses to be used to draw it. It is not advisable to use a horse-roller heavier than four tons, as it will require too many horses, and these would cause too much cutting up. Should a heavier one be required, a steam-roller is preferable. The lightest of these weigh ten tons, and good and solid work is done with them. When the roller has gone several times over the surface, a thin coat of fine, good binding gravel should be spread over, rolled, and watered, filling as well as possible all the cavities, and thus forming a solid and smooth surface.

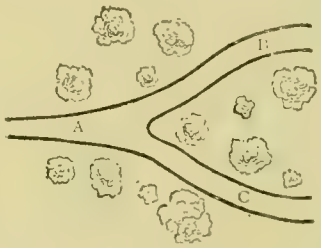

FIG. 508. BAD BIFURCATION.

For a walk, 3in. to 4in. of rough gravel, with a crown of 2½in., is sufficient. A path requires just enough fine gravel to keep it dry. Drives or walks traversing damp spots or following the falling ground have to be

Landscape Gardening—*continued.*

drained. Drains may be placed in the middle or on either side. Drives and walks must have gully-holes, with gratings, in sufficient number, according to the gradient of the ground. The outlet pipes of the gully-holes must be 6in. above the bottom to allow spaces for the deposit of gravel displaced by rains.

Turfed walks are more economical, but they must be kept clean by mowing them and trimming their edges frequently.

The centre of an alley must never be of a higher level than that of the verges. From the lawn bordering an alley one should step down to the alley. The less apparent the walks and alleys are, the better is the general aspect of the garden. Both verges must be kept at the same level at the start, even if the ground is rising on one side and falling on the other.

There are numerous forms of verges, which vary according to circumstances. In Fig. 509 a few sections of good and defective dispositions of verges are shown. In Section A they are flat, as is very often seen; while A′ represents a better disposition, the walk being sunk a little, and the edges of the verges rounded. Sometimes the edges are seen (as in Section B) to be cut straight out as in *a b*, before joining the level of the lawn in *b b*. The lines *a′ a′* of B′ are more deeply sunk, and of a better aspect. They may also be disposed as in *c c*, putting the alley more in view. In Section C the ground is falling according to the line *a b*, and the broken line *d e* must not be imitated, while the section on *a′ b′* in Section C′ could be replaced with advantage by *d′ e′*. When the ground is boggy, the alley must not rise abruptly over the level of the ground (as in *c d* in D); it must be kept above the average surface (*a′ b′* in D′) which is flooded, and be supported by the verges, *c′ d′*, which gradually join the level of the general surface.

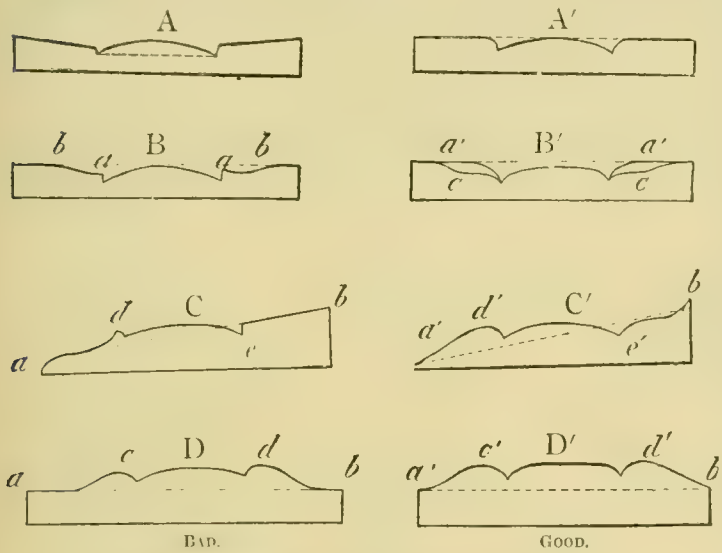

Fig. 509. Sections of Alleys, showing Respectively Bad and Good Dispositions of Verges.

When the fall of the ground is too rapid, it may be interrupted now and again by steps of either wood or stone, between which the slope will be gentler. Stone steps must have a rustic appearance, so as to appear as if naturally found on the spot. They must not be higher than 4in. or 5in. each, and must also be wide enough to allow of taking several steps on each before getting on the next. Wooden steps are made with long branches either left whole or split in the middle; they are then fastened by stout pegs, inserted on the outside, or nailed against the latter when the pegs are inside. Their disposition must be the same as that of stone steps.

Landscape Gardening—*continued.*

Planting. Plants are the fundamental ornament of nature, and therefore of the garden; and it is on their association that the charm of the Landscape mostly depends. Planting is, therefore, of paramount importance in Landscape Gardening. In the creation of a garden the formation of the ground may not be well harmonised—the waters may look artificial, the rocks may not be well disposed; but all these defects may be amended by a cleverly-arranged plantation. Failure in making a good choice of plants, or in grouping them well, is an irreparable mistake. Each tree has its particular aspect and charm when well developed, though its æsthetic qualities may be differently appreciated. On the Continent one is accustomed to see trees with large crowns supported by naked trunks forming the woods, and they are appreciated there as much as those splendid isolated specimens which have been able to grow freely, and whose branches touch the ground. In England a tree is really only appreciated when its trunk is densely covered with branches. In the United States, inspired by the same taste, a tree is not allowed to have its crown supported by a nude trunk, and gardeners there go so far as to top the heads of big trees. All operations, however, which tend to modify the natural form and beauty of a tree ought to be condemned. To cut isolated trees into any shape whatever is bad taste. Such proceedings may be tolerated when dealing with a mass; for instance, in the form of a straight avenue, an arbour, or a hedge, the lines of which are in harmony with the style of the garden. Without any consideration of species and stature, the beauty of a tree lies in the elegance and lightness of its general aspect. A tree with compact and regular foliage, its apparent surface not being broken by the projection of a few branches, is not of agreeable appearance. The white Horse-chestnut is in this condition in its early stage, but it improves in appearance as it grows, and the branches of a fully-developed tree often droop to the ground. How inferior beyond any comparison is the glow of light falling on an unbroken mass of leaves compared with that falling on the noble outlines of an Oak or a Beech! What a variety of gradation of lights and shadows are produced by their prominent branches and deep recesses!

Trees must not only be judged for their particular qualities as isolated specimens, but also for their effects when associated with other species; their position in the Landscape has to be studied. The variety in grouping is infinite, but it has been found that the best effects in nature are obtained when compact masses of trees cover the top of a hill, which they thus make to appear higher. The summits may be crowned by forests of Conifers. Below these should come trees in groups, then isolated specimens, and lastly, mere bushes, which, as it were, break away from the masses on the hill-side to unite themselves with the vales.

Great variety of form and of colour, of light and of shadow, is brought into play. In the meadows groups of big trees should rise here and there. In order that big trees may produce a harmonious effect, they must be grouped with their natural associates in a Landscape, and the introduction of exotic species, though they may be hardy and of good appearance, must be avoided. A large bush of dark green, growing at the foot of a slender tree with foliage of a light hue, produces a happy contrast. A group of two trees produces a good effect only when one differs from the other in a very marked manner. Groups of three trees are often met with in nature, but they are never of the same kind, or at least of the same strength. It is by their difference of size, and by the variety of their foliage, that they attract notice. An equilateral triangle presents a too regular aspect. A scalene triangle will be a better disposition for a group, and its appearance will be enhanced (if the triangle is large enough) by planting a fourth specimen in the middle, especially if the different

Landscape Gardening—*continued.*

species contrast well. Groups of five are well disposed when they are planted at the four angles of a trapezium, and at its centre. They may also be disposed in the shape of an irregular pentagon, but this arrangement has the disadvantage of presenting too circular an appearance. Groups of over nine or ten trees will only have a pleasant appearance if planted in several irregular sections, composed of different kinds of trees. Not only must trees be planted at suitable distances, but in order to present a good appearance the mingling of their branches with each other must be harmonious; their profile and colours will only be appreciated if those points have been happily met. It sometimes happens that these differences are secured in trees of one variety, but of different sizes. It may also be the result of mixing together a group of species, well defined by their forms and the colour of their foliage.

Trees of a pyramidal shape look well by the contrast they afford when grouped with trees with round crowns, such as when towering above a group of Elms. In forming groups, it may be accepted as a rule that whatever the number and the form of the trees, they must, as a whole, in order to produce a satisfactory effect, present that balance in all their parts which should also characterise the isolated specimen. A group, it will be understood, forms a whole, and must be treated as a single object. When Nature is left to provide for herself, the balance of the different parts will seldom be missed. In order to produce a better effect, planted groups of trees must remain in harmony with existing woods, of which they must appear to be only detached parts, and their number must be regulated as may be required.

In shrubs we have an unlimited variety, and in planting large groups they must never be formed of only one species. An exception may be made in planting small gardens where natural disposition is out of consideration. The number of shrubs that are found growing on the banks of rivers is rather small, but, nevertheless, charming effects are obtained by forming groups of some of the following Willows: *Salix Caprea*, *S. purpurea*, *S. rubra*, and *S. vitellina*. Amongst rocks a great variety of vegetation is always met with, growing in most picturesque fashion. Dog Roses, Brambles, Barberries, Elders, and many more form very attractive contrasts. The plants, though many of them are not very decorative by themselves present in such associations very picturesque effects.

After having considered some of the most striking aspects of the plants in their natural state, we now come to their practical application for the decoration of parks and gardens. In the creation of the latter the Landscape-gardener has to deal with old and new plantations. In the first instance, the existing plantations have to be preserved or modified in their outlines when necessary; while, in the second, the surface of the ground may be devoid of vegetation, and the plantations may therefore have to be created. In most cases, both conditions have to be complied with at the same time. It has been stated before how openings can be made, letting light into the boundaries of the Landscape. A park cannot be created under more advantageous conditions than when situated in a wood; here the most fascinating results can be obtained at once. As already said, the indigenous species of trees suffice to create varied effects. The masses which will form the background of the picture, and are seen only from a distance, impart to the Landscape its dominating character, and it is less the beauty of the individual subjects than that of the whole that must be taken into account. From a distance, trees of middling appearance produce good effects; but close to the walks the particular ornamental qualities of each tree have to be taken into consideration.

In making openings, the outlines must present varied forms, but lines, or a succession of sweeps and serpentines that are sinuous to excess, must be avoided. Prominences marked by detached trees and more or less deep recesses, sometimes penetrating into the masses, then breaking sometimes only slightly, will create an infinite variety in lights and shadows. Walks through woods must be treated as openings, and their sides must present the same varied aspects.

Deplorable effects are produced by crowded clumps of circular appearance, often of one species only, and yet such are often met with. It is advisable to leave sufficient space between each specimen, especially when Conifers are concerned, that they may develop under normal conditions, and that their lower branches may be allowed to cover the ground. Isolated groups must not present any formal disposition. In fact, any tendency to a regular aspect must be avoided. Fig. 510 shows some groups of three or four. Of A, B, C, and D, the first (A) and the last (D) are bad, being too regular; while B and C are tolerable, though the trees are of a too regular aspect, being of the same strength. In the forms E, F, G, and H there is a more accentuated variety of aspect. The highest trees are those marked *a*, while those next in height are indicated by *b*; the remainder are of varied and bushy appearance. The differences in height and the forms of foliage produce a striking diversity.

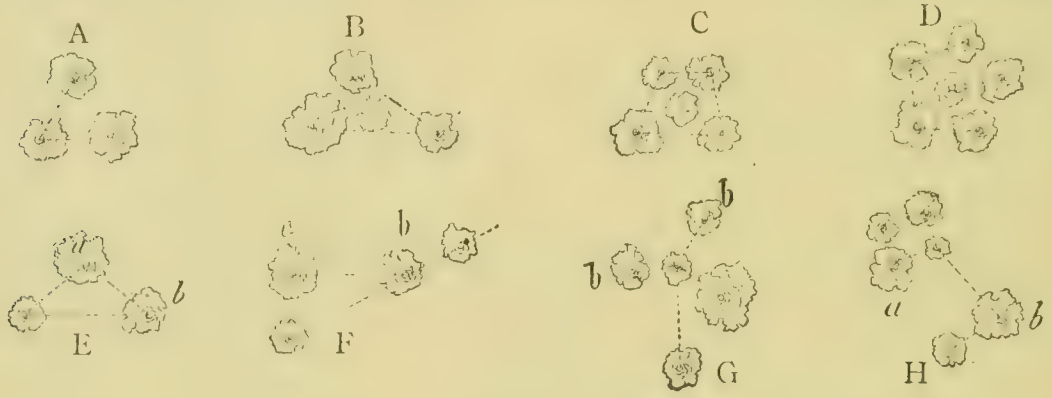

FIG. 510. POSITIONS OF TREES IN ISOLATED GROUPS.

Groups of more than six trees must be considered as consisting of several groups, and not as composing only one. Groups of two trees may produce good effects, but, as has been said, one must be bushy, and the other must be slender and rise above the first.

It is not advisable to group Conifers with other trees, except when planting large wooded masses, where a few specimens here and there, towering above the others, will break the sky-line. It is better to group them by themselves, and to leave their lower branches to develop naturally, and cover the ground. Conifers are very decorative, especially on a falling lawn, close to rocks. If some shrubs are planted at the foot of a big tree, they must not form a circular group, but their outlines must be as varied as possible. They must be all of one kind, the tree providing sufficient contrast. In grouping trees, the pyramidal forms are kept in the

Landscape Gardening—*continued.*

middle. Poplars (*Populus nigra fastigiata*) in small isolated quantities, on the banks of rivers and lakes, look very nice, but their effect is enhanced when supported by groups of Willows.

There must be a marked difference between the plantations of the park and those of the garden close to the house. In the former, as has been said, all the disposition of planting and the choice of the plants must be in harmony with the surrounding Landscape. In the latter the planting may be more apparently connected with the design of the garden. The plants should be finer, and may also be of exotic origin, which, by their growth and tint of foliage, are such as we are accustomed to find in a garden. In the park we have "plantations"; in the garden we have to a certain extent a "collection of plants." The planting in a garden is not proceeded with in the same way: trees are never on a line, and all regularity in the distances is avoided. The big trees of first height (No. 1) in Fig. 511 are 12ft. to 18ft. from each other, and those next in height fill the

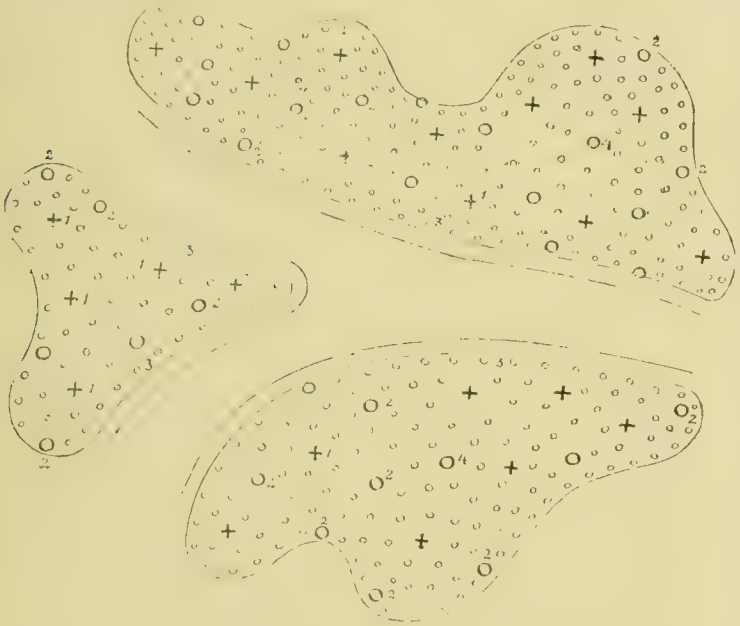

FIG. 511. DISPOSITION OF TREES AND SHRUBS IN GROUPS.

intervals, and are more on the sides of the group. The shrubs (No. 3) on the edges are 4ft. to 5ft. from each other, and those in the centre (No. 4) fill all the empty space, in such a manner, however, as to leave about 5ft. free round the trunk of each tree. A verge of from 2ft. to 3ft., according to the size of the garden, is left between the group and the alley. The first row of shrubs is planted 10in. from the inner line of the verges. The different species of shrubs and trees of which the group is formed must be well mixed. After a few years of growth, the varied aspect obtained will be very good. The strong-growing species will blend themselves with the weaker ones, and will form a delightfully compact whole, while still retaining their individual beauty.

It is wrong to distribute the different species with which a bed is planted in small groups of one species only, as is sometimes seen. The growth, form, and colour of such groups being naturally different, the result obtained is far from presenting a harmonious whole. The trees must not necessarily be in the centre of the groups, although the shrubs must be disposed in such a way that all are seen to their best advantage, the small ones being placed in front and the tallest in the centre. The trees planted close to the alley on the verge of the group are intended to give shade as well as decorative effect. A shady walk is always appreciated.

Landscape Gardening—*continued.*

Small, isolated groups scattered on the lawns produce very nice contrasts, but are only recommended where great attention can be devoted to the keeping of the garden in order. The position of each tree and shrub will have to be marked beforehand, and each must be planted in well-dug and properly-prepared ground. A calm and, if possible, cloudy day should be selected, and the roots well spread in the soil at their proper depth. The branches should be left intact, but on growth commencing they may be slightly cut back. After planting, if the weather happen to be dry, the shrubs, &c., must be well soaked with water. This is particularly necessary with evergreens and Conifers. It is also advisable on the same account to cover the surface of the ground with rotten dung or dry leaves from the wood, in order to protect the roots from frost in the winter and from drought in the spring.

The planting of isolated trees requires particular attention in order to ensure success. Circular holes are dug out—deep if they are intended for species having roots like the Pear-tree or the Sophora, and broader than deep for those with spreading roots. The average depth in rich soil is 4½ft., and the diameter 3ft.; but in poor soil a hole 7ft. wide and 4½ft. deep is required. It is a great advantage when the hole can be dug out several months in advance, and the soil left exposed during that time to the beneficial influence of the air. Before planting, all injured roots must be cut away with a sharp knife, and the branches must be thinned out and pruned in proportion, as the roots are taken off, imparting at the same time a good shape to the crown. The tree must, if small, be kept upright in the middle of the hole, by a man holding it, or when large by means of three ropes tied in the crown, and held, stretched at equal distances, by three men. The roots should be covered with fine soil, this being well rammed in between them with a pointed stick in order not to leave any cavities. The hole must be filled to the height at which the tree used to be, allowing for the sinking of the soil. Some trees, Poplars and Willows for instance, ought to be planted deeper than they were before. Previous to planting, a strong stake must be driven into the middle of the hole to prevent the tree from being shaken by the wind; if it were driven in after planting, some of the roots would be injured. Very large trees are kept in position by three well-stretched wires fastened to the crown, and secured to three strong pegs planted at equal distances. During the first year after planting, in order to protect the trunk from the scorching sun, it can be covered from the ground to the lower branches with a coating of long straw or with reeds. During the summer, if the weather is dry, all the new plantations must be well watered.

American plants, such as Rhododendrons, Azaleas, Kalmias, and Andromedas, are, as a rule, grown close to the house. They delight in a peaty soil, though one may sometimes see Rhododendrons doing well in loam. The bed intended for such plants is excavated a foot deep, and the bottom of the ground is covered by a layer 2in. or 3in. thick of coarse gravel or brick rubbish. This will serve to provide drainage, and will isolate the peat from the natural ground, preventing it from getting sour, and keeping the worms off. This layer is covered with clods of peat, coarsely broken, and all the roots are put at the bottom. The coarser the peat, the better do the plants thrive. The bed is rounded, and the total thickness of the peat is about 1½ft., of which 9in. is above the soil. When small plants are inserted, that depth is not necessary. Rhododendrons must be planted in March, the tallest being placed at the back, so that they may be seen better

Landscape Gardening—*continued.*

when in blossom. They may be either of one colour or mixed. A good disposition is to plant in the middle different red varieties. The edges should consist of one sort only. *Kalmia latifolia* forms very nice edges round groups of varieties and hybrids of *Rhododendron maximum* and *R. arboreum*. The intervening spaces may be planted with *Lilium auratum*.

For planting hedges, different ways of more or less practical value have been recommended. The most

FIG. 512. METHOD OF ARRANGING DIRECT VIEW.

advantageous method is to insert a row of young plants at 20in. from the boundary line of the property—often marked by a ditch. They may also be planted at the bottom of the ditch, the double advantage of which is that they are not seen from a distance, and, at the same time, are protected. Good hedges are formed with *Berberis vulgaris, Cratægus Oxyacantha, C. lucida, Ilex Aquifolium*, and *Maclura aurantiaca*. Hedges of Cratægus and Ilex together are very effective and decorative at the same time.

GROUNDWORK. This cannot be governed by hard-and-fast rules; the natural forms of an undulated surface are so numerous that practically every case has to be treated differently. The natural ground inclinations cannot be altered, though their defects may be improved. While dealing with the details, the natural character of the situation must remain predominant. The centre of a lawn may be hollowed out and its verges raised, giving to the whole surface an agreeable undulating appearance, and at the same time increasing its surface. The places intended for groups of trees and shrubs and flower-beds should be raised above the ground-level, forming mounds which harmonise with the general inclination of the lawn. Between these groups and beds long, sweeping, dale-like depressions should be formed, of which the principal must have their lines of sight directed to the house or other points of rest, and their middle—that is, their lowest part—must never on any account be planted.

If in front of the house, or anywhere in proximity to it, there are hillocks interrupting the view, they must be removed. Fig. 512 is a section representing such a ground disposition. The house (A) is required to be seen in elevation from B, at the bottom of the park, where there is a ruin of picturesque appearance; from B the view of the house is partly hidden by the crest C and the hillock D. To remedy this evil, all the soil above the dotted line in C and D should be taken off and brought to E, filling the deep hollow there represented. A long, sweeping line should be formed. Such obstacles as C and D not only intercept the view, but also give to the surface a confined appearance, while by their removal the opposite effect is obtained. In large gardens and parks it is only the surface of the ground close to the house and the drives that are dealt with. The remainder is left untouched.

Landscape Gardening—*continued.*

Artificial undulations of the ground, if used with care and taste, are very decorative, and the happiest effects and contrasts, giving a great variety of aspect, are possible. On a perfectly flat ground, when a large surface has to be dealt with, it is not advisable to use them. In the case of a lake which has been dug, the excavated soil may be used to raise the verges of the lawn; but, in such situations, decorative aspects depend more on the plantations. In Fig. 513, the plan of a villa garden is given, together with the longitudinal section (AB), and the transverse section (CD), illustrating the formation of the ground-surface. In the middle of the lawn is a cemented lake (F), and with the earth excavated, a mound has been formed at E, serving as background to the picture. The side facing the lake (F) is covered with rocks, planted with herbaceous plants and ferns, hiding the filling-pipe, and so disposed as to form a cascade. The remainder of the mound is planted with shrubs and trees, and on the top is a summer-house. The boundary walls are hidden by thick plantations of shrubs and trees (G, G), and H is a shady resting-place. The groups J, J, close to the house, are composed of Rhododendrons and Kalmias. The groups K, K are planted with evergreen shrubs and other plants. L, L are two Weeping Willows.

FIG. 513. PLAN OF A VILLA GARDEN.

AB, Longitudinal Section; CD, Transverse Section.

M, M are Conifers planted on small eminences with soft slopes. N is a Bamboo. O is a red Horse-chestnut, and at P, P are specimens of Chamærops in their summer garb. The beds Q, Q are occupied during the summer with bedding-plants. R is a specimen of *Cortaderia* (*Gynerium*). The beds Q, Q are about 2ft. above the

Landscape Gardening—*continued.*

level of the alley, and the directions of the undulations, starting from them in varied forms to the lake, are marked in the sections AB, CD.

Strong slopes, when the soil is of a loose nature, or when they exceed 45deg., must be supported by blocks of stone, inserted in the ground at different places, and of which the tops only are seen. Steps can also be formed in the subsoil and the top soil; they should be well rammed down, in order to prevent any "sliding." As a rule, sufficient earth to form the groundwork of a garden can be found on the spot. It is really the quantity of soil available in a place which should guide the operations. The rough-cast of the work is formed with the subsoil. The thickness of the top soil required depends on the quantity at command; but for a lawn, or for turfed borders and verges, a coat of 10in. to 1ft. is generally allowed. The portions which are to be planted will require a thickness of soil of at least 2ft.

When the necessary thickness of top soil has been roughly spread over the surface, it must be levelled by taking with the shovel the soil forming the uneven surface, and filling up the holes with it, thus giving to the surface a finished appearance. Levelling is a delicate operation, which requires taste, clear sight, and practice. For this work one cannot absolutely rely on the points of level fixed on the plan. One has to be guided by the effects produced. When the levelling has been done, the whole should be slightly forked and raked over. The limits of the flower-beds and the groups of shrubs should be marked, the verges formed, the edges trimmed, and lastly the pegs should be taken out. Only the sowing of the grass remains to be done.

WATER. Water gives a great charm to any Landscape, and whenever possible, it should be utilised in the creation of gardens. If existing, it must be preserved and its effects improved. In creating water effects the gardener must restrict himself to natural fitness. A stream rushing over a stony bed, leaping now and again over a rocky barrier, and forming cascades full of boisterous life, characterises mountainous or hilly surroundings; while a placid lake or a quiet, sleepy river running in sweeps across grassy meadows belongs to the low-lying land: yet the latter in its proper position equals in effect the wild mountain torrent. Small lakes, it is true, may be met with on high grounds, but it is rather the exception than the rule. Various effects are to be obtained by creating a lake with its outlines forming bays, promontories, and creeks; but these must depend more or less upon the undulations of the shores and the surrounding grounds, and on the different obstacles the water has met with, or is supposed to have met with, in breaking its way through. When making a large lake, it must look natural, and the work of man must not be apparent. In a small place it is not easy to deal with the outlines of the water in the same way, for a small garden necessarily looks artificial.

It may be necessary to hide from the view of the spectator, by plantations at certain points, portions of the lake, in order to vary the impressions created as he goes round. If the shores are flat and uninteresting, variations may be made by raising the opposite banks at different spots, and planting them with trees which will be reflected in the water. Trees must not fringe the shore, for they would impart to the water a gloomy appearance; but single trees, especially those of pendulous habit, may be planted to hang over the water. Light must be allowed to reflect freely, giving freshness and colour to the scene. The views from the house or other points of the garden should be directed towards the lake where the largest water prospect is obtainable. For the same reason views on a river must be guided, if possible, up or down stream, and not across it. Islands give variety to the outlines of a lake or river. They should not be placed in the centre, but on the side, and there should not be less than 16ft. of water between them and the mainland. If a bridge is constructed, its narrowest point should be at right angles with the shore. The banks, where there will not be any planting, should be turfed below the water-lines. The slopes of the sides immediately below the water-level should be steep, so that when the water falls there will not be any muddy shore laid bare. The depth of the water should not be less

Landscape Gardening—*continued.*

than 4ft., in order to prevent a too rapid evaporation from taking place.

A lake must be constructed with great care, though it does not actually differ much from the work in connection with the formation of the ground already dealt with. If the earthwork consist only of an ordinary excavation, the earth obtained, when not needed to raise the level of the soil intended for groups of trees or to fill depressions of the ground, may be employed close by, in order to avoid unnecessary cartage and work, to vary the aspect of the shores, or to form plantations near the lake or the river. It may, however, happen that the excavation of a lake, or the modification of the bed and the course of a river, demand a special treatment. The soil may be boggy, rendering the task difficult. The work ought to be done in the winter, when the ground is hard, and in portions. Dykes of clay should be erected between the excavated part and the water, and the pump kept working without interruption. The running water must be led away into ditches, and great care must be taken to prevent the flooding of the work by erecting a strong dam at the deviation of the stream. When the soil has been excavated to the intended depth the bottom of the lake should be smoothed, giving the necessary fall to the ground. It must then be made watertight by using either cement or puddle. In the majority of cases, when a solid foundation is available, concrete is used. The bed, when levelled and well rammed, is covered with a layer of not less than 6in. of concrete at the bottom and 8in. on the sides.

The concrete used should be composed of a mixture of three parts of broken stones or coarse gravel and two parts of hydraulic mortar and sand. This mortar itself is a mixture of two parts of sand and one of hydraulic lime. The concrete should then be well and evenly rammed, the surface made smooth with the back of a shovel, and left to dry for a few days. It should then be covered with a layer of Portland cement 1in. thick.

When puddle is used, the ground should be excavated to the required depth, allowing 1ft. thick at the bottom and 18in. on the sides. Puddle is prepared by cutting clay, pouring water on it, and treading it until it is plastic enough for use. When it has been applied on the surface, it must be well trodden and rammed. The shores can be solidified, if the ground should happen to require it, by driving in a few pegs at the edges with branches and interlacing them. If there is any fear of the shores getting washed away, the side can be covered under the water-line with coarse stones.

A lake may also be formed by utilising a stream and erecting across its lower end a strong dam of one and a half to three of base to one of height. This dam should be built up in layers of clay, well rammed, and supported by earth. The surface could be planted with grass and shrubs, but not with trees, as the roots of the latter, when shaken by the winds, would loosen the soil and allow the water to run through. The top of the dam must be at least 5yds. or 6yds. wide, according to the nature of the soil employed and the volume of water to be kept back, and 5ft. above the water-line. Rocks may be scattered about the shores, especially close to the inlet and the overflow, which may be hidden by the aid of plants. The sides below the inlet must be paved to a width of about 6ft. The inlet, the overflow, and the emptying pipes must be built in the solid ground.

DRAINING. Soil that is always saturated and boggy is necessarily cold and poor, as the circulation of warm air, which promotes the evaporation of the moisture, is prevented. The soil gets into a state of decomposition, rendering the existence of any sound vegetation impossible. This condition is due to the subsoil being impermeable; the cold water cannot, therefore, find its way through, and it must be led away by artificial drainage. This operation consists in digging trenches, at the bottom of which pipes are laid to collect the water and lead it out of the ground.

The depth at which drain-pipes should be laid, and the distance at which they must recur, depend upon the nature of the soil. In heavy ground they should be placed at from 2ft. to 3ft. deep, while in light soil 4ft. below the surface, and at intervals of from 20ft. to 40ft., would suffice. The collecting-drains must run parallel

Landscape Gardening—*continued.*

with the line of ground having the greatest fall, and the main drain should lead to the lower ground and fall into a lake or a river, being discharged above the water-level. The drains of the lawns should be made to join those running parallel with the drives and alleys. Collecting-drains should have a fall of 1in. to the yard, and should join the main channel at an acute angle. The pipes must be covered with porous material, such as ordinary soil, broken bricks, crocks, stones, or clinkers, &c., within 6in. of the surface of the ground. *See also* **Garden**, Vol. II.

LANGUAS. A synonym of **Alpinia** (which *see*).

LANGWORT. *See* **Veratrum album.**

LANIUM (from *lana*, wool; in allusion to the woolly flowers). ORD. *Orchideæ*. A small genus (two or three species) of stove, epiphytal Orchids, natives of Brazil, Surinam, &c., allied to **Epidendrum** (which *see* for culture). Flowers rather small, shortly pedicellate; dorsal sepal free, incurved; lateral ones broader, falcate; petals like the dorsal sepal, but narrower; lip connate in a short tube with the base of the short column. Leaves rigid or rather fleshy.

L. Berkeleyi (Berkeley's). *fl.* green, with minute reddish-brown dots, small. *l.* short. Pseudo-bulbs small, linear-oblong. Brazil, 1894.

L. microphyllum (small-leaved). *fl.* dull purple or greenish, woolly; raceme terminal. *l.* distichous, narrow, fleshy, channelled, acute, serrulated, much shorter than the raceme. Demerara. A small, creeping species. SYN. *Epidendrum microphyllum.*

L. subulatum (awl-like). *fl.* pale green. *l.* subulate. Brazil, 1896. Plant small in all its parts.

LANKESTERIA. According to C. B. Clarke, *L. parviflora* is the correct name of *L. hispida* (SYN. *L. longiflora*).

LANTANA. To the species and varieties described on p. 234, Vol. I., the following should be added:

L. involucrata (involucred). *fl.* in dense, globose heads; corolla lilac, with a yellow throat; bracts squarrose, silky. Autumn. *l.* opposite or ternate, scarcely 1in. long, ovate or roundish-rhomboid or oblong. Branches rigid, spreading. *h.* 3ft. West Indies, 1690.

L. nivea angustifolia (narrow-leaved). A synonym of *L. n. mutabilis.*

L. n. grandiflora (large-flowered). In this form the flowers as well as the leaves are much larger than in the type.

Varieties. Comparatively few new varieties have been introduced, though there are one or two of exceptional merit: Drap d'Or, whose bright yellow flowers are very useful in the summer beds; Eclat; Giselle; Hybrida; Phosphore; Pluie d'Or, and Reveil. Those who grow Lantanas must be watchful that with them is not introduced a very destructive species of Scale, **Orthezia insignis** (which *see*).

LAPAGERIA. To the species and varieties described on p. 235, Vol. II., the following should be added:

L. rosea Ilsemanni (Ilsemann's).* A vigorous and free-flowering form, with larger and more brightly coloured flowers than those of the type. 1897. (R. G. 1897, t. 1445.)

Other varieties of garden origin are Nash Court, an improvement upon *L. r. superba*, The Knoll, and Warnham Court.

LAPEYROUSIA. According to J. G. Baker, this genus consists of thirty-two species, natives of Southern and tropical Africa. Flowers generally small; perianth with an almost cylindrical tube slightly dilated towards the throat, the segments oblong-lanceolate, spreading; stamens inserted at the throat of the tube, unilateral, close, arcuate; filaments short; spathe valves small or large, usually herbaceous. Leaves distichous, sub-terete, linear or ensiform.

To the species described on p. 235, Vol. II., the following should be added:

L. grandiflora (large-flowered).* *fl.*, perianth bright red, 2in. in diameter, with a yellow eye, the three lower segments having a large, triangular, dark crimson spot; spikes four- to ten-flowered. *l.* 6in. to 12in. long, ½in. broad. Corm small, stoloniferous. South-east Tropical Africa. Greenhouse. Similar in habit to *Anomatheca cruenta*, but larger. (B. M. 6924.)

LAPORTEA. To the species described on p. 235, Vol. II., the following should be added:

L. moroides (Mulberry-like). *l.*, panicles in pairs from the axils of the lowest leaves. *fr.* purple, Mulberry-like, in pendent bunches, remaining on the plant in a plump condition for nearly a year. *l.* 6in. to 8in. long, broadly ovate-cordate with an acute sinus, often peltately attached to the petiole, acuminate, coarsely serrated, pubescent or villous. Queensland, 1887. A large, greenhouse shrub or small tree, virulently stinging. (B. M. 7057.)

LARBREA. Included under **Stellaria** (which *see*).

LARCH APHIS (*Chermes laricis*). A species of Aphis causing damage to the foliage of Larches. For remedies, *see* **Aphides.**

LARCH BLISTER. Another name for Larch Canker.

LARCH CANKER, or **LARCH BLISTER** (*Dasyscypha calycina*). A well-known destructive fungoid disease of the Larch, found in many countries, including America. Like the Canker of Apple-trees, it is a wound-fungus; it thrives more especially in low, damp situations, and, according to Hartig, Larches in such situations soon become diseased, and die in a few years without any large blisters making their appearance. Trees which are attacked by insects like the larvæ of the Larch Moth are usually affected, as in the wounds made by the insects the spores find a resting-place, and with congenial conditions soon develop. The indications of Canker may be found in late summer by a falling of the needles, which previously have assumed an unhealthy appearance, together with depressed spots on the twigs and stems. Rapidly the fungus spreads by means of the mycelium until the whole tree may be involved. The characteristic cups are produced upon resinous swellings upon the branches. They are beautiful objects, and have already been described in Vol. III., under **Peziza** (which *see*).

The disease is a difficult one to combat once it has attacked a plantation. Cultivators should, however, remember that in summer it remains stationary, the mycelium again becoming active towards autumn and continuing through winter. The best treatment that can be recommended is to cut out the Canker-spots; but this, of course, is only possible when a few trees are involved. Afterwards such spots should be dressed with copper sulphate (*see* **Fungicides**), and then coated with tar. Preventive measures consist in so locating the Larch that it gets plenty of air in an open, elevated situation. In such a place it is far less liable to be attacked than when grown in moist valleys. All diseased parts removed should be carefully burned.

LARCH, FALSE or CHINESE. *See* **Pseudolarix.**

LARCH MOTH (*Coleophora laricella*). The larvæ of this small Moth are directly responsible for much injury to the Larch, by devouring the young and tender buds in spring. The genus is a large one, and well represented in this country. The larvæ mine when young, but afterwards fashion out a case in which they dwell. The larva of the species under notice constructs a whitish cylindrical case out of the fragments of food-plant, and may be found from September onward to May. It is brown in colour. The Moth is rather more than ½in. in stretch of wings, and both fore-wings and hind-wings are grey, as are also head and antennæ. It is on the wing in midsummer. In very bad cases trees are practically defoliated. Remedies are practically useless in the case of this insect.

LARICIO. *See* **Pinus Laricio.**

LARIX. To the species and varieties described on pp. 235-6, Vol. II., the following (based on Dr. Masters' "List of Conifers and Taxads," 1892) should be added:

L. americana. The correct name is *L. pendula.*

L. archangelica (Archangel). A garden synonym of *L. europæa sibirica.*

L. chinensis (Chinese). A synonym of *Cunninghamia sinensis.*

L. davurica [not *dahurica*]. There are two varieties—*japonica* (with bluish-green leaves) and *prostrata* (prostrate). *L. kurilensis* may be the same as *L. d. japonica.*

L. europæa rossica (Russian). More compact than the type, free in growth, and of graceful habit.

Larix—*continued.*

L. c. sibirica (Siberian). A much-branched variety, having stout, horizontal branches, and numerous drooping branchlets clothed with rich green leaves. SYNS. *L. archangelica* (of gardens), *L. Ledebourii.*

L. Kæmpferi (Kæmpfer's). A synonym of *Pseudolarix Kæmpferi.*

L. Ledebourii is a variety of *L. europæa*, its correct name being *L. e. sibirica.*

L. pendula (pendulous). American Larch; Tamarack. The correct name of *L. americana.*

L. sibirica (Siberian). A variety of *L. europæa.*

LAROCHEA TINIFLORA. A synonym of **Rochea tiniflora** (which *see*).

LARREA. To the species described on p. 236, Vol. II., the following should be added:

L. divaricata (divaricately lobed). *fl.*, ovary (and fruit) pilose. June to September. *l.* sessile, deeply bilobed, villous; lobes lanceolate, divaricate. Argentine Republic, 1829.

LASIA (from *lasios*, rough; in allusion to the prickly surface). ORD. *Aroideæ.* A monotypic genus. The species is a robust, marsh-loving, stove herb, requiring similar culture to **Anthurium** (which *see*).

L. aculeata (prickly). A synonym of *L. heterophylla.*

L. heterophylla (variable-leaved). *fl.*, spathe 6in. to 10in. long, the tube 1¼in. to 2in. long, the blade very long, narrow, convolute above; spadix cylindrical, obtuse, ¾in. to 1¼in. long, when fruiting 2¼in. to 3¼in. long; peduncle 8in. to 12in. long. *l.* very variable, hastate when young, when old more or less deeply pedate-pinnatipartite, 8in. to 12in. long and broad, the lateral partitions two or three, linear-oblong or oblong-lanceolate, more or less acuminate, narrowed towards the base; petioles 8in. to 20in. long. Caudex 1¼in. thick, more or less densely prickly. India. SYNS. *L. aculeata, L. spinosa, Dracontium spinosum. Cyrtosperma Martveiffianum* is probably identical with this.

L. spinosa (spiny). A synonym of *L. heterophylla.*

LASIAGROSTIS. Included under **Stipa** (which *see*), the correct name of *L. Calamagrostis* being *S. Lasiagrostis.*

LASIERPA. A synonym of **Chiogenes** (which *see*).

LASIOLEPIS (of Boeckeler). A synonym of **Eriocaulon** (which *see*).

LASIOPERA. A synonym **of Bartsia** (which *see*).

LASIOPETALUM. Corethrostylis (which *see*) is included hereunder by the authors of the "Genera Plantarum." Several species formerly classed in this genus are now referred to **Thomasia.**

L. arborescens (tree-like). A synonym of *Seringia platyphylla.*

L. Baueri (of gardens). A synonym of *Guichenotia ledifolia.*

LASIOPTERA RUBI (Raspberry Midge). *See* **Raspberry—Insects.**

LASIOPTERA VITIS (Vine Midge). *See* **Vine Galls.**

LASIOPUS (of Don). Included under **Taraxacum** (which *see*), the correct name of *L. sonchoides* being *T. montanum.*

LASIORRHIZA. Included under **Leuceria** (which *see*). *Lasiorrhiza rosea* and *L. runcinata* are synonyms of *Leuceria runcinata.*

LASIOSIPHON (from *lasios*, woolly, and *siphon*, a tube; in allusion to the hairy or silky-pubescent perianth tube of most of the species). ORD. *Thymelæaceæ.* A genus embracing about twenty-five species of stove or greenhouse shrubs, with the habit of **Gnidia** (which *see* for culture), natives of Southern and tropical Africa, Madagascar, and tropical Asia. Flowers hermaphrodite, densely capitate at the tips of the branches; perianth with a cylindrical tube and five spreading lobes; stamens ten. Leaves opposite or scattered. Only one species calls for description here.

L. anthylloides (Anthyllis-like).* *fl.* chrome-yellow, umbellate, sub-sessile; perianth tube 1½in. long, very slender, silky-pilose. September. *l.* sessile, spreading or decurved and revolute, oblong-lanceolate, acute, silky-villous. Stems erect, leafy. South Africa, 1889. Greenhouse. (B. M. 7303.)

L. eriocephalus (woolly-headed). The correct name of *Lachnæa eriocephala.*

L. purpurea (purple). The correct name of *Lachnæa purpurea.*

LASIOSPERMUM. To the species described on p. 236, Vol. II., the following should be added:

L. radiatum (rayed). *fl.-heads* radiate; rays white, ½in. or more in length. *l.* somewhat fleshy, 1in. to 2in. long, pinnatipartite, the upper segments ½in. to 1in. long, all erecto-patent. *h.* 2ft. or more. Half-hardy perennial. SYNS. *Lancisia bipinnata, Lidbeckia bipinnata, Matricaria bipinnata.*

LASIOSTOMA (of Schreber). A synonym of **Strychnos** (which *see*).

LASTHENIA. *L. glaberrima* is a form of *L. glabrata*, according to the "Index Kewensis."

LASTREA. *L. aristata* is identical with *Aspidium aristatum*; *L. eburnea*, with *Asplenium oxyphyllum*; *L. Standishii*, with *Aspidium laserpitiifolium*; and *L. varia*, with *Aspidium varium.*

LATACE (name not explained by its author). ORD. *Liliaceæ.* A monotypic genus. The species is a greenhouse, bulbous plant, nearly allied to *Leucocoryne*, but having the perianth more tubular and the style included. For culture, *see* **Allium.**

L. Volkmanni (Volkmann's). *fl.* white, small, tubular in the lower half, long-pedicellate, umbellate; spathe with two lanceolate valves; stamens three, with three sterile filaments alternating with them. *l.* two, narrow. Bulb tunicated. *h.* 10in. Andes of Santa Rosa, 1889. (R. G. 1889, t. 1302, f. 1.)

LATANIA. *Cleophora* is synonymous with this genus.

LATENT. Remaining dormant; *e.g.*, Latent Buds.

LATERALS. A term applied by gardeners to the side shoots springing from a stem or branch. For instance, those shoots on Vines which emanate from the spurs caused by pruning are Laterals, and any shoots starting from the Laterals are sub-Laterals. Again, the shoots emanating from strong growths of the current year's growth are Laterals, as frequently seen in Peaches, Nectarines, and Plums, and large trees are quickly formed by "laying-in" all the Laterals which grow in a suitable direction on young wall-trees.

LATHRÆA. Including *Clandestina.* To the species described on p. 237, Vol. II., the following should be added:

L. Clandestina (Clandestina).* *fl.* pale greyish-purple or violet, with a dark purple lower lip, erect, 2in. long; racemes 3in. to 5in. high, many-flowered. April. Stems innumerable, densely crowded, nearly buried in the earth, 4in. to 6in. high; scales ½in. to ¾in. broad. Rhizomes densely interlaced. Europe, 1838. A very handsome perennial. (B. M. 7106.)

LATHYRUS. Including *Clymenum.* So important has the culture of the Sweet Pea become, alike as a pot-plant for the greenhouse and as a decorative and a market plant outside, that some fuller information than is given in Vol. II. is called for. First, it may be considered as a hardy annual than which there is nothing finer. In the garden of the average amateur, the Sweet Pea receives but scant attention, and its period of beauty is naturally very restricted; but where it is cultivated as it should be, the flowering season may be prolonged to almost any extent.

To start with, the soil must be rich, and if this is not so naturally, it must be made so by the incorporation of thoroughly rotten manure, dug in, say, the previous autumn, and then allowed to remain open to frost and air until the time for sowing the seeds comes round. This is usually some time in early spring, choosing a day when the soil is in working order, and breaking it up roughly. To prevent the seeds when sown from being taken by birds and mice, it is usual to soak them for a quarter-of-an-hour in paraffin, or else to coat them with red-lead. The seed may either be sown in rows some 6ft. or 8ft. apart, to form a hedge, or in colour-groups, using a large inverted pot and sowing the seed round the impression made by the rim, keeping the seed, in the latter case, a good distance apart. In large gardens it is usual to make sowings in March, April, and May in drills drawn about 3in. deep, and to protect the quarters with black cotton arranged diagonally.

As soon as the seedlings are an inch or two out of the soil, they should be firmly staked, using sticks containing all the twiggy growths, and the soil at each side made firm. It is always advisable to use a light mulching, as this prevents the moisture in the soil from evaporating

Lathyrus—*continued.*

should a period of drought occur in late spring, as it frequently does. Rotten leaf-mould and well-rotted horse-manure are as good as anything. This mulching will minimise considerably the labour in connection with watering, which in very dry weather does more harm than good by caking the top soil. The after-treatment consists in keeping the flowers picked so as to prevent the formation of seed-pods. By this method the plants may be kept going for some time, and after they begin to show signs of exhaustion and general wear and tear, they may be gone over with the shears and topped. This will induce them to make new growths, from which flowers will continue to be produced until bad weather sets in. We have frequently had Sweet Peas in all their beauty in mid-October by adopting the "topping" plan suggested.

Sweet Peas may also be grown with success as window-box subjects by sowing them thickly in the front rows, allowing them to droop over, and keeping them in place by means of string stretched from each side of the window. They require similar treatment to that already noted; but as the mulching cannot be done, copious waterings must be given. The back of the boxes may be occupied with any tall plants liked.

Some cultivators who are desirous of getting Peas outdoors at the earliest time possible, use 3in. pots, and sow in them towards the end of February half-a-dozen seeds, covering them ½in. deep, and making the soil firm. This latter is of the greatest importance. To start them they are placed in gentle heat, but afterwards kept in cold frames, and allowed plenty of air whenever the conditions are favourable. They are thence transferred to the open ground in April, and afforded a sunny position.

Recently the value of the Sweet Pea as a pot-flower has been shown, and this method of culture is likely to become still more popular. The seeds are sown in boxes at the beginning of September, and the young plants afterwards potted singly into "sixties" and stood in a cold frame, as near the glass as possible, giving plenty of air, as above advised. From there they are re-potted about the beginning of December, using larger-sized pots—"forty-eights"—while by the end of the next month they will be ready for their final shift into 10in., when they must be neatly staked. The aim of the cultivator in the winter months must simply be to keep the plants on the cool side. No forcing must be attempted; in fact, the house temperature should never reach 50deg.

Hardly less beautiful nowadays are the varieties of the Everlasting Pea, which are to be found in many colours. They are extremely useful for making pretty hedges, and afford plenty of cut-flower material. For these, as for the Sweet Peas, twiggy sticks should be employed for them to ramble over. Then two or three of the dwarf species and varieties—like *L. rotundifolius*, *L. sativus*, *L. s. azureus*, and *L. s. albus*—are most effective when employed upon rockeries or in groups in the front row of the summer borders. Yet another section is the trailing one, of which *L. tingitanus* and *L. sylvestris platyphyllus* are fairly well known.

To the species described on pp. 237-8, Vol. II., the following should be added. *See also* **Orobus** (which is included hereunder by Bentham and Hooker).

L. Armitageanus is a synonym of *L. nervosus.*

L. azureus (azure-blue). This plant (referred to in F. & P. 1881, p. 22) is a variety of the old *L. sativus.*

L. Clymenum (Clymenum). *fl.* blue, or having the standard red and the wings blue, one to six to a peduncle. *l.*, lower petioles dilated, leafless, linear-lanceolate; upper ones five- or six-leaved, linear. Stems tetragonal, winged. South Europe. Annual.

L. Davidii (David's). *fl.*, corolla yellowish-white, at length ochreous; peduncles many-flowered, ultimately exceeding the leaves. *fr.*, pods narrow-linear. *l.* three- or four-jugate; leaflets oval, rhomboid-oval, or oval-oblong, obtuse at both ends or slightly acute at apex; stipules semi-cordate or semi-sagittate. Japan, North China, 1883. A tall, highly glabrous perennial. (R. G. 1127.)

L. Drummondii (Drummond's). *fl.* of a bright carmine, very large, several borne on the stalks which spring from the axils of the leaf-shoots. *fr.*, pods straight, glabrous, many-seeded. *l.* reduced to a pair of rounded-ovate, sessile leaflets. *h.* 3½ft. to 4ft. Origin unknown. This requires a shady and sheltered position.

Lathyrus—*continued.*

L. Gorgoni (Gorgon's). *fl.* fuscous, rather large; peduncles one-flowered, shorter than or nearly equalling the leaves. *l.* having one pair of lanceolate leaflets and trifid tendrils. Stems diffuse, winged. Sicily.

L. lætiflorus (pretty-flowered). *fl.* nearly white or faintly flesh-coloured, nearly 1in. long; standard veined, and suffused with light pink at back; racemes longer than in *L. violaceus* (which this species resembles in leaves and habit). California, 1894. Half-hardy perennial.

L. luteus (yellow). *fl.* bright yellow; corolla twice as long as the calyx; racemes pedunculate, six- to twelve-flowered, equalling or exceeding the leaves. *l.*, leaflets six or eight, oblong, acute, membranous, 2in. to 4in. long; stipules leafy. Stems sub-erect, glabrous, 2ft. to 3ft. high. Western Himalayas, 1832.

L. magellanicus. The correct name is *L. nervosus.* This is frequently offered for sale in plant catalogues; but oftener than not *L. sativus*, a well-known annual, or else *L. tingitanus* is substituted.

L. nervosus (nerved). The correct name of *L. magellanicus* (S. B. F. G. ser. ii. 344).

L. niger (black). The correct name of *Orobus niger.*

L. pubescens (downy).* *fl.* pale violet, disposed in dense racemes; calyx pubescent; peduncles longer than the leaves. Summer. *l.* unequally pinnate; leaflets oblong-lanceolate, twice as long as the petioles. Stems winged, and, as well as the leaves, pubescent. Chili and Uruguay, 1840 and 1892. A magnificent, greenhouse climber. (B. M. 3996.)

L. sativus. This species, described in Vol. II., is largely cultivated as a fodder plant in Europe, and also in India and Egypt. The meal, however, made from the seeds is extremely poisonous.

L. s. albus (white). Pure white. *h.* 1ft.

L. s. azureus (azure-blue). *fl.* of a clear azure-blue. *h.* 1ft.

L. s. coloratus (coloured). *fl.* white, purple, and blue.

L. Sibthorpii (Sibthorp's). A synonym of *L. undulatus.*

L. splendens (splendid). *fl.* scarlet-purple, large, very beautiful, arranged in clusters of from ten to twelve; keel almost 1in. long. *l.* very variable. Lower California, 1881. Greenhouse or half-hardy. Allied to the Everlasting Pea. (B. M. 7575.)

L. sylvestris platyphyllus delicatus (delicate coloured). *fl.* white, flushed with pink. There is also a pretty garden variety known as Pink Beauty.

L. s. Wagneri (Wagner's). *fl.* a dark red, handsome. A hardy perennial trailer.

L. undulatus (wavy).* *fl.* magenta-red; standard orbicular, 1in. in diameter; racemes unilateral, five- or six-flowered; peduncles 6in. long. May and June. *l.*, leaflets twin, oblong, sub-acute or cuspidate; stipules lanceolate-deltoid. Stems prominently winged. *h.* 2ft. to 3ft. Turkey, 1839. Perennial; requires a warm situation. SYN. *L. Sibthorpii* (B. M. 7499). A handsome plant.

L. vernus (spring). The correct name of *Orobus vernus.* There are three good varieties: *albus* (white), *flore-pleno* (double-flowered), and *flaccidus* (the correct name of *Orobus flaccidus*).

L. violaceus (violet). *fl.* violet-blue, about ⅜in. long, the standard veined with darker, nearly parallel veins; racemes ten- to fourteen-flowered. *l.* light green, with about twelve small leaflets. *h.* 6ft. to 8ft. California, 1894. Half-hardy perennial.

Varieties. So much has the Sweet Pea increased in favour of late years, that the number of varieties of *L. odoratus* now available has reached enormous proportions. A Sweet Pea conference and a show devoted to this beautiful annual have been held. The rapid rise in favour is largely due to the improvements florists have made in the flowers, than whom none have been more assiduous than Mr. Eckford, of Wem. New varieties may not increase at the same rate in the future, but improvements upon existing kinds will be made. At the time of writing, however, the following may be considered to embrace most of the best in cultivation:

AMERICA, white, striped pink; AURORA, white, flaked orange-salmon; BLACK KNIGHT, deep maroon, vigorous and free; BLANCHE BURPEE, white, free; BOREATTON, deep maroon; CALYPSO, bright magenta, flushed mauve; CAPTAIN OF THE BLUES, a combination of bright purple and light blue, fine flower; CHANCELLOR, bright orange, with orange-pink wings; COLONIST, rosy-lilac; COQUETTE, deep primrose, suffused purplish-rose; COUNTESS CADOGAN, violet and light blue, with lavender keel; COUNTESS OF ABERDEEN, white and pale pink; COUNTESS OF POWIS, bright orange, suffused purple, very glossy, lovely combination of colour; COUNTESS OF RADNOR, pale lavender; DOROTHY TENNANT, light violet; DUCHESS OF EDINBURGH, scarlet, flushed crimson; DUCHESS OF SUTHERLAND, pearl-white, suffused light pink, very fine; DUKE OF SUTHERLAND, deep claret, with indigo-blue wings, handsome; DUKE OF WESTMINSTER, maroon and bright violet, quite distinct;

Lathyrus—*continued.*

EARLIEST OF ALL, rose, with white wings; EMILY ECKFORD, dark blue, tinged with reddish-mauve, large, and a flower of good texture; EMILY HENDERSON, white, large, and free; FASCINATION, magenta-mauve; FIREFLY, bright crimson, free, and of good substance; GEORGE GORDON, rich lake; GORGEOUS, orange-pink standard, and soft pink wings, two flowers in a spike; HER MAJESTY, soft pink; HON. F. BOUVERIE, bright coral-pink; LADY BEACONSFIELD, salmon, tinted rose, very distinct; LADY GRIZEL HAMILTON, lilac, very beautiful; LADY MARY CURRIE, deep orange-pink, shaded rosy-lilac; LADY NINA BALFOUR, soft mauve, shaded dove-grey, one of the best for exhibition; LADY PENZANCE, bright rose, very chaste; LADY SKELMERSDALE, rosy-lilac, with white wings, distinct; LEMON QUEEN, blush-pink, tinted lemon, with nearly white wings; LOTTIE ECKFORD, deep mauve, with white wings, beautifully edged with mauve; LOVELY, light pink; MARS, bright red, becoming deeper with age, the best of its colour; MIKADO, orange-cerise, striped white; MONARCH, bronzy-crimson and deep blue, large flowers; MRS. ECKFORD, delicate primrose; MRS. FITZGERALD, soft cream, and edged with pale pink; MRS. GLADSTONE, delicate pink; MRS. JOSEPH CHAMBERLAIN, white, striped bright rose; NAVY BLUE, a combination of purple and violet; ORANGE PRINCE, bright orange-pink; OTHELLO, dark maroon; PINK CUPID, dwarf; PRIMA DONNA, soft pink; PRIMROSE, pale primrose; PRINCE EDWARD OF YORK, scarlet and deep rose, very showy; PRINCE OF WALES, bright rose, free; PRINCESS OF WALES, mauve-striped on white ground; QUEEN VICTORIA, soft yellow, overlaid purple; ROYAL ROSE, deep rose standards and pale rose wings; SADIE BURPEE, white, with incurving standards; SALOPIAN, deep crimson, tinged with rich red, and tinted orange-scarlet, large, fine flower; SENATOR, cream, shaded and striped chocolate; SHAZADA, dark maroon, shaded purple, distinct; STANLEY, deep maroon, good form; TRIUMPH, orange-pink, with white wings flushed purple; VENUS, salmon-buff, shaded rosy-pink; WHITE CUPID, dwarf.

LATTICE-LEAF PLANT. *See* **Ouvirandra fenestralis.**

LAUREL, PORTUGAL. *See* **Cerasus lusitanica.**

LAUREL, SEASIDE. *See* **Phyllanthus latifolius.**

LAUREL, SHEEP. *See* **Kalmia angustifolia.**

LAUREL, VARIEGATED. *See* **Aucuba.**

LAUREMBERGIA. A synonym of **Serpicula** (which *see*).

LAURENTIA. To the species described on p. 238, Vol. II., the following should be added:

L. carnosula (slightly fleshy).* *fl.* blu. with two yellow, white-bordered spots on the lower lip, axillary, in shape resembling those of *Lobelia Erinus*. *l.* opposite and alternate, linear-lanceolate, acute, entire or somewhat serrated. Branches diffusely spreading, ascending. California. A hardy annual, of Lobelia-like aspect. (B. M. 6257.)

LAURERIA. A synonym of **Juanulloa** (which *see*).

LAURESTINUS (properly **LAURUSTINUS**). *See* **Viburnum Tinus.**

LAUROPHYLLUS. A synonym of **Botryceras** (which *see*).

LAURUS. Several species formerly included hereunder are now referred to **Cinnamomum, Lindera, Nectandra, Ocotea, Persea,** and **Sassafras.**

L. nobilis flourishes best in an open, well-drained soil, and a sunny spot should be selected, as the wood must be well matured to withstand the rigours of severe winters. The Sweet Bay-tree is very useful for growing in pots and tubs for standing on terraces and in cool conservatories and vestibules. It also withstands gas fumes well. It is rather impatient of root-disturbance, and care should be exercised in transplanting, which is best attended to either about the end of September or in April. If the weather is dry at planting-time, a watering overhead, as well as at the roots to settle the soil, will be of immense benefit in assisting the plant to establish itself in its fresh quarters.

LAVANDULA. Including *Stechas*. To the species described on p. 239, Vol. II., the following should be added:

L. angustifolia (narrow-leaved). A synonym of *L. vera*.

L. lanata (woolly). *fl.* violet; spike elongated, somewhat interrupted; floral leaves lanceolate or linear. *l.* oblong-

Lavandula—*continued.*

lanceolate, linear, or sub-spathulate, entire, revolute-margined, densely white-woolly on both sides. Spain, 1872. Greenhouse evergreen. (Ref. B. 301.)

L. latifolia (broad-leaved). A synonym of *L. vera*.

LAVATERA. To the species described on pp. 239-40, Vol. II., the following should be added:

L. crestiana (Chateau de Crest). A hybrid, probably between *L. maritima* and *L. trimestris*; it has the largely opened, flattened flowers and velvety leaves of the former, and the petal-colour, calyx, and bracteoles of the latter. July to December. *h.* 5ft.

L. cretica (Cretan). The correct name of *Malva mauritiana*.

L. insularis (insular).* *fl.* yellowish-white, striped with purple, on stout, deflexed and curved pedicels nearly 1in. long. *l.* 3in. to 6in. broad, palmately lobed, with a narrow sinus, borne on long petioles; lobes rounded, obtuse, coarsely crenate. Mexico, 1896. A compact, half-hardy, finely stellate-pubescent shrub, about 4ft. through. (G. & F. 1896, p. 164, f. 27.)

L. maritima (maritime). *fl.* white; pedicels axillary, solitary. May. *l.* tomentose, somewhat rounded, obtusely angled and crenate. Stems shrubby, also tomentose. *h.* 2ft. South Europe, 1597.

L. trimestris alba (white).* This is a beautiful variety of the well-known *trimestris*, having snowy-white flowers. Both are very effective annuals, whether grown in beds or in borders, as they produce an abundance of flowers which last in perfection a long time when cut. Seeds may be sown in either autumn or spring, the former for choice.

LAVENDER, SEA. *See* **Statice.**

LAVENIA. A synonym of **Adenostemma** (which *see*).

LAVERNA VINOLENTELLA. *See* **Apple-shoot Moths.**

LAVRADIA. *L. glandulosa* is a synonym of *L. montana*.

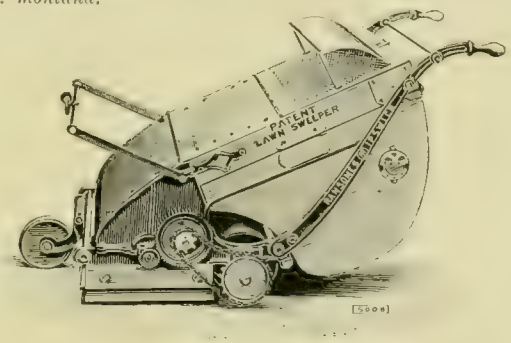

FIG. 514. RANSOMES' PATENT LAWN SWEEPER.

LAWN MOWERS. During the past few years many improvements have been made in Lawn Mowers: not only are they in many cases lighter, but they also combine easy working, efficiency, and greater speed. Ransomes' "Patent Double Angle Cutting Barrel" is a decided improvement on the old machines where the spiral or twist of the blades was in one direction. In the new machine the blades are in two lengths, and the spiral at opposite angles, thus throwing the grass into the centre of the collecting-box. Another improvement is the ribbed rollers, which prevent the machine from sliding when mowing on sloping lawns or banks. Messrs. Ransomes have also a patent screw adjustment fitted to their machines which does away with the awkward plan of turning over the machine to adjust the blades. The screws are turned from above, or as the machine stands, and blades can be regulated till they cut evenly and without friction, and with the least labour. For cutting sharp, sloping banks, Ransomes' "Anglo-Paris Mower" is very useful, fitted with a long handle. The grass is cut neatly and evenly by this machine. The "Pennsylvania" is a light, easily-worked machine, very suitable for large lawns, golf-links, &c., and being light is moved with little trouble from one part of the grounds to another. A most useful arrangement for moving Lawn Mowers with ease from one place to another is the "New Lawn Mower Carriage," sold by most makers. The Lawn Mower is raised by the handles, and the carriage—which consists of two low

Lawn Mowers—*continued.*

wheels connected—is pushed under the machine, so that the part in front of the rollers rests on the wood cushion of the carriage, where it remains firm, and may then be wheeled rapidly over rough walks or ground without any injury to the machine.

Steam Lawn Mowers were introduced a few years ago, and have proved more economical than those worked by horse-power; they do their work well where the lawns are moderately level, and will no doubt be more in demand for cricket-grounds and similar places in the future. They are easily managed, and the cost of fuel is light.

LAWN-SWEEPING MACHINE. This is a very useful machine, and is made in two sizes—one worked by horse-power, and the other by two men. There are four brushes, which revolve rapidly, sweeping everything up into a receptacle behind, leaving the grass quite clean and fresh-looking. When full, the receptacle is easily removed by being drawn out from the slides which keep it in position; but in the horse-power machine the receptacle is emptied by a lever, which opens a flap and deposits the rubbish in a heap on the ground. See Fig. 514.

LAXMANNIA (of Fischer). A synonym of **Coluria** (which *see*).

LAXMANNIA (of Forster). A synonym of **Petrobium** (which *see*).

LAYIA. To the species described on p. 244, Vol. II., the following should be added:

L. elegans (elegant).* *fl.-heads* numerous, 1½in. across; ray florets yellow on the basal half, white above; disk yellow. *l.*, lower ones pinnatifid; cauline ones narrow-lanceolate, subamplexicaul. Stems much-branched, reddish, pubescent. 1883. A dwarf, but very showy and floriferous annual.

L. e. alba (white). There is a white-flowered form of this.

L. glandulosa (glandular).* *fl.-heads* solitary, 1in. in diameter; ray florets white, flat, broadly obovate, three-lobed at apex; disk yellow, small. Summer. *l.* alternate, linear, obtuse, 1in. to 1½in. long. 1886. A beautiful, glandular-hairy annual, branching from the base. (B. M. 6856.)

L. heterotricha (variable-haired). *fl.-heads* white, sometimes tinged with rose; ray florets ten to eighteen; hairs of the pappus bristles less abundant, the inner woolly ones wanting. Generally larger and more erect; otherwise like *L. glandulosa*. California.

LAYING-IN. The process of Laying-in the young wood of trees against walls to fill up, extend, or form the tree is known by this name. The temporary insertion of newly-received trees from a nursery or other source in a shallow trench, where they can remain until permanently planted, is also termed Laying- or Heeling-in.

LAZY-BEDS. A form or system of Potato culture that never found much favour, and is now obsolete. It consisted in deeply digging a piece of ground, and putting the tubers on the surface in straight lines; the soil was taken out from between the rows and placed on the tubers, the Potatoes thus growing on ridges. Another plan was to have the ground dug as above, the tubers put more closely on the surface, and alleys made round the beds, the soil from the alleys being spread evenly over the tubers.

LEADER. The terminal shoot of an excurrent trunk, commonly forming the apex of a conical tree, as in the Fir.

LEÆBA. A synonym of **Cocculus** (which *see*).

LEAF BLIGHT OF CELERY. *See* **Cercospora.**

LEAF-BLIGHT, or LEAF-SCALD, OF PEAR AND QUINCE (*Entomosporium maculatum*). This is a much-dreaded fungoid disease in America, where it is particularly destructive to the two fruits associated with its name, though not entirely restricted thereto, Apples, Peaches, and Cherries also being attacked. Spring or early summer is the season when the disease principally manifests itself in the form of roundish, reddish spots on the newly-opened leaves; or it may not show itself until summer is well advanced. The spots in bad cases run into one another, and thus the roundish shape they at first assumed is destroyed. They also darken with age, and are depressed. Shoots and fruits, as well as foliage, are attacked, and frequently the last-named all falls off.

Leaf-Blight—*continued.*

Weak Bordeaux Mixture should be applied directly the disease is seen, and the sprayings should be repeated at intervals. Unless, however, all the fallen leaves and the diseased shoots are carefully burned, the fungus will appear again the following season. It may be that the sprayings in the early part of the year when the fruits are small, may not be sufficient to entirely check the spread of the disease. In that case one of the clear **Fungicides** (which *see*) should be employed.

LEAF-BLIGHT OF STRAWBERRY (*Sphærella fragariæ*). *See* **Strawberry-Leaf Blight.**

LEAF-CAST OF PINES (*Lophodermum pinastri*). *See* **Pine Blight** or **Pine Needle Cast.**

LEAF CUP. *See* **Polymnia.**

LEAF-CURL OF PEACH. *See* **Peach—Fungi** (Vol. II.).

LEAF-CURL OF POTATO (*Macrosporium solani*). *See* **Potato—Fungi.**

LEAF-CUTTER BEES. *See* **Aculeate Hymenoptera.**

LEAF-RUST. *See* **Chrysanthemum Leaf-Rust.**

LEAF SPOT OF CELERY. *See* **Cercospora.**

LEAF WEEVILS. A name applied to certain species of **Phyllobius** (which *see*).

LEAROSA. A synonym of **Doryphora** (which *see*).

LEAST YELLOW UNDERWING. *See* **Tryphæna.**

LEATHER JACKET. *See* **Eucalyptus resinifera.**

LEAVES. *See* **Leaf.**

LECANIUM. A genus of Scales, several species of which have proved themselves pests in this and other countries. *L. Persicæ*, the Brown Peach Scale, has already been described and illustrated under **Scale Insects** in Vol. III. Then there is the Brown Currant Scale (*L. coryli*; *L. ribis*), which is common upon hardy bush fruits like Gooseberry, Currant, and Raspberry, as well as upon certain ornamental trees and shrubs—Cotoneasters, for instance. A common and destructive species of this genus is *genevense*, affecting Hawthorns and very occasionally Apple-trees. This is also one of the species of which the males are known and recognised. The female is a deep red; but the male is of a vivid red and extremely small in comparison, even for Scales, with his partner. They may be found upon Hawthorns in early spring, and in very large numbers. Under glass there is a minute species showing a partiality for Roses; it is of a dirty-yellow colour, spotted with black, and round in form. For method of treatment, *see* **Scales,** in present volume, and also **Scale Insects,** in Vol. III.

LECANIUM HESPERIDUM. *See* **Scale Insects.**

LECANIUM PERSICÆ. *See* **Peach—Insect Pests.**

LECANIUM VITIS. *See* **Vine Scale Insects.**

LECANOPTERIS (from *lekane*, a dish, and *Pteris*, a Fern; in allusion to the habit). ORD. *Filices*. A genus embracing four or five species of stove Ferns, natives of Malaya, allied to *Dicksonia* and *Deparia*. *L. carnosa* is remarkable for the form and manner of growth of its rhizome, which forms an irregular, putty-like crust surrounding the branches of trees, to which it clings by means of short, brown, fibrous roots; the interior is full of small cavities or galleries, similar to those of *Hydnophytum* and *Myrmecodia*. The plant is (or was recently) grown at Kew.

LECHLERA. A synonym of **Solenomelus** (which *see*).

LECONTIA. A synonym of **Peltandra** (which *see*).

LECYTHEA ROSÆ. *See* **Rosa—Fungi.**

LEDEBOURIA HYACINTHINA. A synonym of **Scilla indica** (which *see*).

LEDGERIA. A synonym of **Galeola** (which *see*).

LEEA. SYNS. *Aquilicia*, *Ottilis*. To the species described on p. 247, Vol. II., the following should be added:

L. amabilis splendens (splendid).* A lovely variety, having the stems, petioles, midrib, and under-surface of the leaves coloured red. Borneo, 1884. (I. H. 518.)

L. Rohersiana (Rœhrs'). A synonym of *L. sambucina Rœhrsiana*.

L. sambucina (Sambucus-like). *fl.* greenish-white. *fr.* dry, the size of a small Cherry. *l.* pinnate or tripinnate, often 3½ft. by 4ft.; leaflets stalked, very variable in size and shape, acute or acuminate, serrated. Tropics of the Old World.

L. s. Rœhrsiana (Rœhrs'). *l.* pinnate, 16in. long, glaucescent, cordate-oblong, acuminate, deeply toothed, bronze-green when young. Colombia, 1897. Plant variable, resembling a *Cissus*. SYN. *L. Rohersiana* (G. C. 1898, i., p. 242, f. 92).

LEECHEE. *See* **Litchi.**

LEEK. For all soils and positions the Musselburgh and the London Flag are the most reliable sorts, being perfectly hardy and standing well through the winter in the most exposed situations. Each has a long, thick stem, and is largely cultivated. Dobbie's Champion Prize, Monstrous Carentan, The Lyon, Henry's Prize, and Ayton Castle Giant, are all of immense size and most suitable for exhibition. Most of these varieties have been grown and exhibited with the blanched portion over 20in. in length and 4in. in diameter, the whole plant weighing over 4lb. All the varieties are suitable for cultivating in either the North or the South.

LEGOUZIA. A synonym of **Specularia** (which *see*).

LEICHARDTIA (of Brown). A synonym of **Marsdenia** (which *see*).

LEIOCARYA. A synonym of **Trichodesma** (which *see*).

LEIOCHILUS. SYN. *Cryptosanus*. The correct spelling is *Leochilus*, the name *Leiochilus* being applied to a genus of *Rubiaceæ* not in cultivation.

LEIPHAIMOS. A synonym of **Voyria** (which *see*).

LEJICA. A synonym of **Zinnia** (which *see*).

LEMA TRILINEATA. *See* **Potato — Insect Pests.**

LENIDIA. A synonym of **Wormia** (which *see*).

LENNEA (commemorative of M. Lenné, a foreign landscape gardener). ORD. *Leguminosæ*. A small genus (two species) of greenhouse trees or shrubs, one Mexican, and the other a native of Central America; they are closely allied to *Wistaria*. Flowers pink or greenish, in axillary racemes or fascicled at the axils. Leaves impari-pinnate. *L. robinoides* (P. F. G. iii., p. 27, f. 246) has been introduced, but is probably not now grown.

LENT LILY. A popular name for Narcissus, Pseudo Narcissus. Also called English Lent Lily.

LENTEN ROSES. *See* **Helleborus.**

LENTICULA PALUSTRIS. A garden name for **Pistia Stratiotes** (which *see*).

LEOCHILUS is the correct spelling of *Leiochilus*.

LEONTICE. Some of these tuberous rooted plants, though regarded as hardy, are best grown under a hand-light or in a greenhouse, as they produce their flowers very early in the year. The tubers should not be covered in planting.

To the information given on p. 249, Vol. II., the following should be added:

L. Alberti (Albert Regel's). *fl.* ochreous, streaked reddish-brown at back, nearly 1in. across; raceme conical. April. *l.*, fully-formed ones on petioles 4in. to 5in. long, sub-digitately five-partite, the leaflets rather fleshy, elliptic, obtuse; stipules ⅛in. long. Stems several, very stout, each giving off two radical, undeveloped leaves (which fully develop long after the flowering period), and a stout flower-stem 6in. to 8in. high. Western Turkestan, 1886. Half-hardy. (B. M. 6900; R. G. 1057, f. 2.)

L. altaica is now regarded as synonymous with *Bongardia Rauwolfii*.

L. darwasica (Darvas). *fl.* golden-yellow, large, racemose; bracts slightly coloured on the margins. February. *l.*, cauline ones trifoliolate, with a winged or auricled base; radical ones having roundish-ovate leaflets, glaucous, and sometimes reddish on the margins; floral ones in two series, six in each. Bokhara (at 5000-6000ft.), 1888. Hardy.

Leontice—*continued*.

L. Leontopetalum (Leontopetalum). *fl.* in a terminal, compound raceme; petals one-third the length of the orbicular sepals. Spring. *fr.*, capsule 1in. to 1½in. long. *l.* biternately cleft; segments ovate or obovate, rarely sub-cordate, 1in. to 1½in. long, the terminal one sometimes twice- or thrice-parted. *h.* 1ft. to 1½ft. Greece, &c. Hardy. *L. vesicaria* is a form of this species.

L. odessana (Odessa). A synonym of *Bongardia Rauwolfii*.

L. thalictroides (Thalictrum-like). A synonym of *Caulophyllum thalictroides*.

L. vesicaria (bladder-like). A form of *L. Leontopetalum*.

LEONTODON. *Apargia* is synonymous with this genus.

LEONTODON (of Adanson). A synonym of **Taraxacum** (which *see*).

LEONTOGLOSSUM. A synonym of **Delima** (which *see*).

LEOPARDANTHUS. A synonym of **Dipodium** (which *see*).

LEPACHYS. *L. columnaris* and *L. pinnatifida* are the correct names of *Rudbeckia columnaris* and *R. pinnata*.

LEPANTHES. To the species described on p. 251, Vol. II., the following should be added:

L. gracilis (slender). *fl.* ¼in. long; sepals bright yellow; petals deep yellow, usually with a maroon-purple border on the inner side; lip yellow; column dull purple; raceme 1in. to 1½in. long. *l.* elliptic, mucronate, ⅜in. to 1⅜in. long. Stems slender, 1½in. to 2in. long. Origin unknown; grown at Kew.

LEPARGYRÆA. A synonym of **Elæagnus** (which *see*).

LEPERIZA. Two species formerly referred here—*L. eucrosioides* and *L. latifolia*—are now classed under **Stricklandia** and **Urceolina** respectively (which *see*).

LEPICEPHALUS. A synonym of **Cephalaria** (which *see*).

LEPIDANCHE. A synonym of **Cuscuta** (which *see*).

LEPIDONEMA. A synonym of **Microseris** (which *see*).

LEPIDOPELMA. A synonym of **Sarcococca** (which *see*).

LEPIDOSTEMON PENTSTEMONOIDES. A synonym of **Pentstemon antirrhinoides** (which *see*).

LEPIDOTE. Scaly or scurfy.

LEPIDOTHAMNUS. A synonym of **Dacrydium** (which *see*).

LEPIDOZAMIA. Included under **Macrozamia** (which *see*).

LEPIRONIA (in part). Synonymous with **Mapania** (which *see*).

LEPTACTINA (from *leptos*, slender, and *aktin*, a ray; in allusion to the circle of narrow lobes in the limb of the corolla). Sometimes spelt *Leptactinia*. ORD. *Rubiaceæ*. A genus comprising four species of stove shrubs, natives of tropical Africa. Flowers conspicuous, fascicled at the tips of the branchlets, sessile or shortly pedicellate; calyx five-parted; corolla tube elongated, silky, the limb of five spreading, narrow-oblong or lanceolate lobes; stamens five; fascicles sessile or pedunculate. Leaves opposite, rather large, shortly petiolate, elliptic, obovate-oblong, or lanceolate, membranous; stipules ample, connate at base. Branchlets terete. The following are the only species in cultivation. They thrive in well-drained, fibrous loam, and may be increased by cuttings.

L. Mannii (Mann's). *fl.* white, fragrant, disposed in terminal, dense, sessile cymes; corolla 4in. long, with five spreading lobes 2½in. long. *l.* oblong, obtuse or shortly acuminate, cuneate at base, sub-sessile, 3in. to 8in. long, 1½in. to 3½in. broad, the margins reflexed. *h.* 6ft. to 12ft. Upper Guinea, 1893. A nearly glabrous shrub, of Randia-like habit. (B. M. 7367.)

L. tetraloba (four-lobed).* *fl.* solitary, sessile, terminal; calyx ½in. long; corolla white, minutely papillose outside, the tube 1⅓in. long, the lobes ⅔in. long, with alternating coronal appendages one line long. *l.* 2½in. to 7in. long, ⅔in. to 1⅔in. broad, oblanceolate, cuneately narrowed to the rather acute base; petioles two to nine lines long. Usagara Mountains, 1885. A neat little, bushy shrub.

LEPTANTHE. A synonym of **Macrotomia** (which *see*).

LEPTANTHUS. A synonym of **Heteranthera** (which *see*).

LEPTARGYREIA. A synonym of **Shepherdia** (which *see*).

LEPTARRHENA (from *leptos*, slender, and *arrhen*, male; in allusion to the subulate stamens). ORD. *Saxifrageæ*. A monotypic genus. The species, *L. amplexifolia* (SYN. *L. pyrolifolia*), is a hardy, perennial herb, with the habit of *Pyrola*, and having small, white flowers and stem-sheathing petioles. It has been introduced from North America, but is not of much horticultural value.

LEPTOBALANUS. A synonym of **Moquilea** (which *see*).

LEPTOCALLIS. Included under **Ipomœa** (which *see*).

LEPTOCARPUS. A synonym of **Tamonea** (which *see*).

LEPTOCERAS. Included under **Caladenia** (which *see*).

LEPTOCODON (from *leptos*, slender, and *kodon*, a bell; in allusion to the shape of the flowers). ORD. *Campanulaceæ*. A monotypic genus, the species being a slender, glabrous, greenhouse, perennial twiner, formerly included under **Campanumæa** (which *see*).

L. gracilis (slender). The correct name of *Campanumæa gracilis*.

LEPTOGLOTTIS. Included under **Schrankia** (which *see*).

LEPTOGYNE. Included under **Pluchea** (which *see*).

LEPTOSPERMUM. Including *Glaphyria* and *Pericalymna*. To the species described on p. 252, Vol. II., the following should be added:

L. Annæ (Mrs. Anna Schadenberg's). *fl.* white, with red stamens, small, axillary and terminal, solitary or two or three together. *l.* lanceolate, ¼in. to ⅜in. long, ascending. Branches slender, ascending. Mindanao, 1885. (R. G. 1184.)

L. baccatum (berried). *fl.* white; calyx glabrous, the teeth coloured and pubescent. June. *fr.*, capsule baccate. Summer. *l.* linear-lanceolate, pungent, one-nerved, three-nerved at base. Branchlets hairy. Australia, 1790.

L. grandiflorum (large-flowered). A name applied to forms of *L. flavescens* and *L. scoparium*.

L. juniperinum (Juniper-like). A form of *L. scoparium*.

L. pubescens (downy). The correct name of *L. lanigerum*.

LEPTOSTACHYA (of Mitchell). A synonym of **Phryma** (which *see*).

LEPTOSTELMA. Included under **Erigeron** (which *see*).

LEPTOSTEMMA. A synonym of **Dischidia** (which *see*).

LEPTOSTIGMA. A synonym of **Nertera** (which *see*).

LEPTOSYNE. To the species described on p. 252, Vol. II., the following should be added:

L. Douglasii (Douglas's). *fl.-heads*, rays ½in. or more in length; peduncles long, scape-like, one-headed. *l.* once to thrice parted into nearly filiform divisions; all but the lowest alternate. *h.* 9in. to 12in. California.

L. gigantea (gigantic). *fl.-heads* resembling small Sunflowers. *l.* finely divided. Stem soft-wooded, 2ft. to 8ft. high. California, 1895. Half-hardy. (R. G. 1895, f. 111-12.)

L. Stillmani (Stillman's). *fl.-heads*, ring of the disk florets beardless; achenes somewhat obovate, quite smooth and naked on the back, becoming papillose or tubercled on the inner face; peduncles scape-like, one-headed. *l.*, all but the lowest alternate; lobes linear, ⅛in. broad. California, 1873. A low annual. (R. G. 1897, p. 612, f. 83.)

LESCHENAULTIA. To the species described on p. 253, Vol. II., the following should be added:

L. bicolor major (two-coloured, greater).* A blue-flowered, garden variety. 1884. (Gn. 1884, p. 468.)

L. formosa major (greater) * *fl.* dark orange-red, numerous, pendulous; peduncles ⅜in. long. *l.* closely set, linear. 1886. A free-flowering shrub. (R. H. 1886, p. 468.)

LESPEDEZA. Including *Oxyramphis*. To the species described on p. 253, Vol. II., the following should be added:

L. bicolor floro-albo (white-flowered).* A white-flowered variety. 1893.

L. Delavayi (Delavay's).* *fl.* deep violet, passing into purplish-black, disposed in a large, terminal panicle. *l.* trifoliolate; leaflets elliptic, obtuse, green above, silvery beneath. *h.* 3ft. to 6ft. Yunnan, China, 1890. A hardy perennial, of bushy habit. (R. H. 1890, p. 225, f. 70.)

L. eriocarpa (woolly-fruited). *fl.* deep purplish-red, ⅜in. to ½in. long; racemes copious, many-flowered, 2in. to 4in. long; calyx (and pods) silky-hairy. July. *l.*, leaflets obovate-cuneate, ½in. to 1in. long, thinly grey-canescent beneath. *h.* 3ft. to 4ft. Temperate Himalayas, &c., 1819. An erect half-hardy shrub. SYN. *Oxyramphis macrostyla* (B. R. xxxii., t. 23).

L. macrocarpa (large-fruited).* *fl.* purple, small, numerous, disposed in racemes, produced during several months. *l.* trifoliolate. North China, 1883. A hardy, ornamental shrub.

L. trigonoclada (triangular-branched). *fl.* pale yellow or whitish, disposed in terminal panicles. September. *l.* elongated, glabrous, coriaceous. Stems and branches triangular. Gorges of Hee-chan-men, China, 1890. A curious and remarkable, hardy perennial.

L. capillipes, *L. hirtella*, *L. eriocarpa polyantha*, and *L. yunnanensis*, described in R. H. 1890, pp. 226-7, are probably not yet in cultivation.

LESSER BROAD-BORDERED YELLOW UNDERWING. *See* **Tryphæna.**

LESSER CELANDINE. *See* **Ranunculus Ficaria.**

LESSER SPEARWORT. *See* **Ranunculus Flammula.**

LESSER YELLOW UNDERWING. *See* **Tryphæna.**

LETTSOMIA (named in honour of J. C. Lettsom, a British physician and naturalist). ORD. *Convolvulaceæ*. A genus embracing upwards of thirty species of climbing, more or less hairy, stove shrubs, natives of Eastern Asia and tropical Africa. Corolla tubular-funnel-shaped; stamens included or exserted: cymes axillary, pedunculate, densely corymbose or capitate, bracteate. Leaves alternate, undivided, often rounded or cordate at base. Only one species calls for mention here—that described in Vol. I. as *Argyreia capitata*. For culture, *see* **Argyreia.**

LETTSOMIA (of Ruiz and Pavon). Included under **Freziera** (which *see*).

LETTUCE. On hot, dry soils, where Lettuces are so liable to "bolt" during the summer, without forming hearts, it is a good plan to sow the seed thinly in drills, and thin out the plants to proper distances apart as soon as they are large enough to handle, at the same time keeping them well watered. By this means no check is given, as in the case of transplanted Lettuces, and they quickly form good, tender hearts. In many gardens it is almost impossible to get good Lettuces in hot, dry weather without adopting this method of sowing the seed, and not transplanting.

Sorts. To the varieties named in Vol. II., the following may be added as especially good.

Cabbage Lettuces. *DANIELS' CONTINUITY, heads medium, solid, leaves thick and edged with red, very crisp and tender; withstands hot weather better than any other variety. *GOLDEN YELLOW, heads large, solid, crisp, and of good flavour; an excellent variety for summer use. PERFECT GEM, heads medium, solid, tender, and fine flavour; a good, dark green variety, withstanding drought well.

Cos Lettuces. *CHAMPION WHITE, heads very large, whitish-green, firm, and sweet; a very good summer variety. *LEVIATHAN, a larger and improved form of the old Brown or Bath Cos; *LONDON WHITE, heads large, quickly developed, firm, and of good flavour; much esteemed by market growers.

LETTUCE APHIS (*Siphonophora lactucæ*). *See* **Lettuce—Insects,** Vol. II.

LETTUCE MILDEW (*Peronospora ganglioniformis*). Little can be added of practical value to the information contained in Vol. II. Though the name above adopted is the one generally applied to the disease, yet the fungus is not restricted to the Lettuce, but is found upon Cinerarias, Sonchus, Artichokes, &c. Whole houses of Lettuce are sometimes affected by the disease in winter, and when this is the case care should be taken not to utilise such structures another season for a similar crop. A more recent scientific name for the Lettuce Mildew is *Bremia lactucæ*.

LETTUCE, WATER. *See* **Pistia Stratiotes.**

LEUCADENDRON. SYNS. *Conocarpus* (of Adanson), *Protea* (of Linnæus). To the species described on p. 255, Vol. II., the following should be added:

L. plumosum (plume-like). *fl.* yellow, in sessile heads; males ¼in. long; females as large as a small Apple, sub-globose. July. *l.* sessile, linear-lanceolate, obtuse, narrowed at base, twisted, ¼in. to 1in. long. Branches fastigiate. *h.* 4ft. 1774.

LEUCADENDRON (of Linnæus). A synonym of **Protea** (which *see*).

LEUCÆNA GLAUCA. The correct name of **Acacia glauca** (which *see*).

LEUCANIA UNIPUNCTA. *See* **Army Worm.**

LEUCANTHEMUM. Included under **Chrysanthemum** (which *see*).

LEUCERIA (from *leukeres*, white; some species are clothed with white wool). SYN. *Leucheria*. Including *Chabræa* and *Lasiorrhiza*. ORD. *Compositæ*. A genus embracing about twenty-five species of greenhouse, annual or perennial herbs, allied to *Chaptalia*, natives of extra-tropical South America or the Andes. Flower-heads purple, pink, blue, or white, homogamous. Leaves sometimes all radical, sometimes alternate on the stems, entire, incised, or pinnately dissected. *L. runcinata* is the only species calling for description here. For culture, *see* **Annuals.**

L. runcinata (runcinate). *fl.-heads* white, fragrant, often changing to pink. June. *l.* oblong, sessile, sub-amplexicaul, more or less deeply pinnatifid, the segments rather distant. Flowering branches somewhat paniculate. Stems weak, 1ft. to 1½ft. high. Andes, 1844. SYNS. *Chabræa rosea*, *C. runcinata* (B. M. 4116), *Lasiorrhiza rosea*, *L. runcinata*.

LEUCHERIA. *See* **Leuceria.**

FIG. 515. LEUCHTENBERGIA PRINCIPIS.

LEUCHTENBERGIA. This genus affords one of the most remarkable instances of plant mimicry that occur in the Cactus order. Remove the flower from *L. principis*, and very few people indeed would think of calling it a Cactus, but would probably consider it a short-leaved Yucca. In habit, in form, in leaf, and in texture, it more resembles a Yucca or an Agave than anything else, and until it flowered it was considered such by the Kew authorities. The leaves, or rather tubercles, are sometimes longer and slenderer than in Fig. 515. The nearest approach to this plant is *Mammillaria longimamma*, in which the tubercles are 1in. or more long, finger-shaped, and crowned with a few hair-like spines. But the *Leuchtenbergia* bears its flowers on the ends of the tubercles, and not from the axils, as in all others. This peculiarity leads one to infer that tubercles are modified branches, the spines representing the leaves. Some species of *Mammillaria* and *Echinocactus* develop young plants from the tops of their tubercles; and this also points to the probability that the latter are branches. In *Leuchtenbergia*, the tubercles fall away as the plant increases in height, leaving a bare, woody stem similar to that of a Yucca.

Leuchtenbergia—*continued.*

The *Leuchtenbergia* has always been difficult to keep in health. It thrives best when kept in a warm, sunny house during winter, and in an exposed, airy, warm position under a frame during summer. It may be watered regularly whilst growing—that is, from April to September—and kept quite dry all winter. The soil should be well-drained loam, and the roots should have plenty of room. A specimen may be seen in the Kew Collection.

Propagation may be effected from seeds, or by removing the head from an old plant, putting the former in sand, and placing it under a bell glass to root, watering it only about once a week till roots are formed. The old stem should be kept dry for about two months, and then watered and placed in a sunny, moist position, where it can be syringed once a day. A shelf in a stove is the best position for it. Here it will form young buds in the axils of the withered tubercles, and on the edges of the persistent parts of the tubercles themselves. They first appear in the form of tiny tufts of yellowish down, and gradually develop till the first leaf-like tubercle appears. When large enough, the buds may be removed and planted in small pots to root. If an old plant is dealt with in this way in April, a batch of young ones should be developed and rooted by October. Grafting does not appear to have ever been tried for this plant. When sick, the plant should be carefully washed, and all decayed parts cut away; it may then be planted in very sandy loam, and kept under a bell glass till rooted.

LEUCOCEPHALA. A synonym of **Eriocaulon** (which *see*).

LEUCOCORYNE. To the species described on p. 256, Vol. II., the following should be added:

L. purpurea (purple). *fl.* lavender and crimson-maroon, two to eight produced on each scape. *l.* Grass-like, as in other species. Chili, 1894. Hardy.

LEUCOHYLE. A synonym of **Trichopilia** (which *see*).

LEUCOIUM. J. G. Baker includes **Acis** (which *see*) under this genus. Perianth broadly campanulate; tube none; segments uniform, ovate or oblong, connate towards the base; stamens epigynous; filaments filiform, shorter than the basifixed anthers. Though nominally hardy, yet all the species are not good outdoor subjects. *L. trichophyllum*, for instance, does best when inserted in pots in a greenhouse, or else in a cold frame, using a very sandy compost. For the rockery, *L. autumnale* is better suited than for the border, and this also should be planted in a sandy compost.

To the species described on p. 257, Vol. II., the following should be added:

L. carpathicum (Carpathian). A form of *L. vernum*.

L. hyemale (wintry).* *fl.*, perianth white, the segments oblong, imbricated, ½in. long, tinged green at back, the three inner shorter and more obtuse than the outer; peduncle slender, erect, one- or two-flowered. Spring. *l.* two to four, contemporary with the flowers, narrow-linear, 6in. to 12in. long. Bulb brown-tunicated. Maritime Alps. (B. M. 6711; Fl. Ment. 21.) SYNS. *L. nicæense*, *Acis hyemalis*.

L. nicæense (Nicean). A synonym of *L. hyemale*.

L. pulchellum* is the correct name of *L. Hernandezii*, which is accorded specific rank by Baker; it differs from *L. æstivum* in its smaller flowers (produced a fortnight earlier) and narrower leaves.

L. roseum (rosy). *fl.* usually solitary; perianth limb rose-red, ½in. long; segments oblanceolate; peduncle slender, 2in. to 4in. long. September and October. *l.* filiform, produced after the flower. Bulb ½in. to ¾in. in diameter. Corsica, 1820. SYN. *Acis rosea* (G. B. F. G., t. 297).

L. r. longifolium (long-leaved). *fl.* larger. *l.* longer. Plant more floriferous. 1886.

Leucoium—*continued.*

L. tingitanum (Tangier). *fl.* white, five or six in an umbel at the top of a strong scape 1ft. to 1½ft. high; spathe valves two. Spring. *l.* narrow-linear, 1ft. long, appearing with the flowers. Marocco. Allied to *L. trichophyllum.*

L. trichophyllum (hairy-leaved). *fl.* white, slightly tinged with rose at the base of the segments; scape 6in. to 12in. high, two- to four-flowered. April. *l.* about three, filiform, about as long as, and produced with, the scape. Spain, Marocco, &c., 1820. (B. R. 544.) SYN. *Acis trichophylla.* The form *grandiflora* has larger flowers than the type.

L. vernum carpathicum (Carpathian).* In this form the perianth segments are tipped with yellow instead of green; the flowers are very sweetly scented. 1895. (B. M. 1993, under name of *L. carpathicum.*)

LEUCOPHÆA SURINAMENSIS. *See* **Cockroaches.**

LEUCOPHYLLUM (from *leukos*, light or white, and *phyllon*, a leaf). ORD. *Scrophularineæ.* A small genus (three species) of low, much-branched, greenhouse shrubs, densely scurfy-tomentose with usually silvery-white wool, natives of Mexico and its Northern borders. Flowers showy, on short, bractless, axillary peduncles; corolla violet-purple, with a broad tube and five rounded, spreading lobes. Leaves small, obovate or roundish, shortly petiolate. *L. texanum*, the only species introduced, will probably thrive in any fairly good soil, and may be increased by cuttings.

L. texanum (Texan). *fl.*, corolla almost campanulate, the limb 1in. across, delicately and softly villous within. Spring and early summer. *l.* tomentose, obovate, ¼in. or more in length, almost sessile. *h.* 2ft. to 8ft. Southern borders of Texas, 1890. (G. & F. iii., p. 483, f. 63.)

LEUCOPHYTA. Included under **Calocephalus** (which *see*).

LEUCOPSIDIUM (from *Leucopsis*, an allied genus, and *eidos*, resemblance). SYN. *Keerlia* (of De Candolle). ORD. *Compositæ.* A small genus (three species) of hardy or half-hardy, many-stemmed, annual or biennial herbs, natives of the Mexican region, and properly classed under the name *Aphanostephus*; they are closely allied to *Myriactis.* Flower-heads mediocre or rather large, solitary at the tips of the branches, heterogamous; ray florets varying from white to violet-purple; disk yellow; involucre hemispherical; receptacle convex or almost conical, naked. The following should be treated as half-hardy annuals. *See* **Annuals.**

L. arkansanum (Arkansas). *fl.-heads* having rays ¼in. long. Summer and autumn. *l.* varying from oblong-spathulate to broadly lanceolate, the lower ones often toothed or sinuate-lobed. *h.* 1ft. to 2ft. Arkansas, &c., 1838.

L. ramosissimum (much-branched). *fl.-heads* about 1in. across, on slender peduncles; ray florets violet-blue. *l.*, upper ones linear or lanceolate, entire or few-toothed; lower ones laciniate-pinnatifid or incised. *h.* 4in. to 12in. Texas. A very compact, carpet-like subject.

LEUCOPTERA LABURNELLA. *See* **Laburnum Moth.**

LEUCORHAPHIS. A synonym of **Brillantaisia** (which *see*).

LEUCOSTEMMA. Included under **Helichrysum** (which *see*).

LEUCOTHOË. One or two species formerly included hereunder are now referred to **Agarista, Agauria,** and **Pieris.**

LEWISIA. This genus, which differs from *Calandrinia* in the capsule dehiscing from the base to the apex (and not in the opposite direction, as in the latter genus), now embraces three species. To that described on p. 259, Vol. II., the following should be added:

L. Tweedyi (Tweedy's). *fl.* flesh-pink, with a bronzy sheen, 2in. to 3in. across; peduncles rather longer than the leaves, one- or two-flowered. August and September. *l.* many, all radical, 2in. to 3½in. long (including the short, winged petiole), broadly ovate or obovate, obtuse. North-western United States, 1899. A glabrous, tufted, stemless perennial. (B. M. 7633.)

LEXARSA. A synonym of **Myrodia** (which *see*).

LIABUM. To the species described on p. 259, Vol. II., the following should be added:

L. Maroni (Maron's). *fl.-heads* pale yellow, radiate, corymbose, on long peduncles. *l.* petiolate, triangular-hastate, distantly toothed, 4in. to 5in. long, 3in. to 4in. broad. *h.* about 2ft. Brazil, 1887. A greenhouse or half-hardy, white-tomentose perennial. SYN. *Andromachia Maroni.*

LIATRIS. SYN. *Psilosanthus.* These are all useful plants, as the species will thrive where little else will succeed. All are excellent Bee plants. To the species and varieties described on pp. 259-60, Vol. II., the following should be added:

L. cylindracea (cylindrical). *fl.-heads* pink, few or several, cylindrical, 1in. or less in length, with a turbinate base; bracts all appressed. September. *h.* 1ft. 1811.

L. pumila (dwarf). A synonym of *L. spicata montana.*

L. spicata montana (mountain-loving).* *fl.-heads* large; spike proportionally short. *l.* broader than in the type. *h.* 10in. to 20in. SYNS. *L. pumila, L. spicata* (S. B. F. G., t. 49).

LIBANOTIS. Included under **Seseli** (which *see*).

LIBANUS. A synonym of **Boswellia** (which *see*).

LIBERTELLA ULCERATA. *See* **Figs—Pests.**

LIBERTIA. To the species described on p. 260, Vol. II., the following should be added:

L. azurea (blue). A garden synonym of *Orthosanthus multiflorus.*

H. cærulescens (bluish). *fl.* pale blue; inflorescence 4in. to 6in. long, consisting of very numerous many-flowered umbels. *l.* linear, rigid, green, 1ft. or more in length. Stem 1ft. to 2ft. long, bearing two to four reduced leaves. Chili, 1873.

L. tricolor (three-coloured). *fl.* snow-white, mediocre; panicle rather few-flowered; branches dichotomous, two- or three-flowered. *fr.* orange coloured. *l.* Grass-like, green, whitish-green, and red, coriaceous, acuminate. New Zealand, 1863. Plant highly glabrous, tufted.

LIBERTIA (of Dumortier). A synonym of **Funkia** (which *see*).

FIG. 516. LICUALA JEANENCEYI.

LIBOCEDRUS. To the species described on p. 261, Vol. II., the following should be added:

L. Bidwillii (Bidwill's). Young leaves and branches similar to those of *L. Doniana*, but not so broad; old branches having fastigiate, four-angled twigs $\frac{1}{16}$in. in diameter. New Zealand. Conservatory species.

L. decurrens aureo-variegata (golden-variegated). A variety with persistently golden-variegated leaves. 1896.

LICUALA. Flowers usually small, scattered, hermaphrodite; spadices interfoliolar, sheathed by tubular, coriaceous, persistent spathes. Fruit small. To the species described on p. 262, Vol. II., the following should be added:

L. Jeanenceyi (Jeanencey's).* *l.* fan-shaped, cleft to the base into seven or eight divisions, which are squared at the apex, but notched with bifid division. New Caledonia, 1898. A handsome Palm, clothed to the base with leaves. See Fig. 516, for which we are indebted to Messrs. W. H. and L. Collingridge.

L. Kirsteniana (Kirsten's).* This is described as "a pretty Palm, with deeply-cut leaves." Madagascar, 1895.

L. Muellerii (Mueller's). *fr.* crimson, in large, straggling panicles. *l.* closed all round so as to appear peltate, plicate, divided to more than half their length into truncate lobes obtusely toothed and jagged and 2in. to 3in. broad at the end, the whole leaf forming a flat, stiff, shield-like disk 6½ft. across. *h.* 30ft. Queensland. SYN. *Livistona Ramsayi.*

L. spinosa (spiny). The correct name of *L. horrida.*

L. triphylla (three-leaved). *fl.*, spadix 1ft. long, slender, with a few branches. *l.* few, flabelliform, three- to nine-parted; segments 8in. to 10in. long, broadly crenate; petioles 2ft. long, less than ½in. broad, sparingly armed with small spines. Stem only 3in. to 4in. high. Malaya.

L. Veitchii (Veitch's). *fl.* rather distant, ½in. long; spadix 14in. long, slender, with six or eight branches. *l.* nearly 2ft. across, sub-orbicular, cuneate in the lower third, convex, bright green, regularly plicate in slightly curved lines, the margins shortly cut into bifid tips ½in. to ¾in. long; petioles armed with stout prickles. Stem very short (at seven years old). Borneo, 1883. (B. M. 7053.)

L. amplifrons is in cultivation at Kew.

LIDBECKIA (commemorative of Eric Gustavius Lidbeck, formerly Professor of Botany at Lund, Sweden). SYN. *Lancisia* (of Lamarck). ORD. *Compositæ.* A small genus (three species) of greenhouse under-shrubs or half-herbaceous plants, natives of South Africa and South America. Flower-heads mediocre, long-pedunculate at the tips of the branches; rays white, in one series; disk yellow; receptacle flattish; involucre in two or three series. Leaves alternate, often rather broad, incised or pinnatifid. The two species introduced thrive in a compost of peat and loam, with the admixture of some charcoal and silver-sand. Propagation may be effected by cuttings, inserted in sandy peat, under a hand-glass.

L. lobata (lobed). *fl.-heads* smaller than in *L. pectinata.* May. *l.* petiolate, sub-palmately three- to five-lobed, dotted, villous; lobes mucronate; petioles ¼in. to 1in. long, about equalling the blade. *h.* 1ft. to 2ft. South Africa, 1800. Plant clothed with long, silky hairs. SYN. *Cotula quinqueloba.*

L. pectinata (comb-like). *fl.-heads* like those of the Oxeye Daisy; peduncles 1in. to 3in. long. May and June. *l.* subsessile, oblong, pinnatifid, 1in. to 1½in. long, glaucous beneath; lobes three to five on each side, broadly linear, the lower smaller. Branches rod-like, leafy. *h.* 2ft. to 3ft. South Africa, 1774. Plant sparingly pubescent or glabrous.

LIEVENA. A synonym of **Quesnelia** (which *see*).

LIFTING. A very important operation, especially with fruit-bearing trees which are growing rampantly and bearing little or no fruit, and also with trees that are in bad health through the roots having entered poor or injurious subsoils. With other trees and shrubs, Lifting is generally to transport trees from one position to another as more suitable for them. Whatever class of tree it is intended to lift, it is necessary to commence the operation by digging a trench sufficiently far away from the trunk as to not unduly injure the principal roots. After having dug a deep trench all round the tree, the soil is gradually worked out with a steel fork, bruising the roots as little as possible, and working out the soil from underneath the tree until it is seen that all roots are free, and the tree able to be lifted right out. Before replanting, all badly-bruised or jagged roots should be cut back, and the tree then planted with as little delay as possible, giving the roots a good soaking of water to settle the soil about them. The Lifting of Vines requires more care. The best plan is to

Lifting—*continued.*

begin at one end of the Vine border, and carefully remove all soil. As the roots become free of soil they ought to be drawn back out of the way and wrapped in wet mats, which must not be allowed to become dry. When a new border is made, the roots can be spread out in the new compost and well watered when the operation is completed. The best time to lift trees and shrubs generally is the end of October, and for Vines just before the foliage falls, shading the Vines and syringing them daily once or twice to preserve the leaves. If they can be retained fresh, they will materially assist the Vines to make new roots in the fresh border. *See also* **Transplanting.**

LIGHTFOOTIA. *L. tenella* is the correct name of *L. ciliata.*

LIGHTFOOTIA (of Schreber). A synonym of **Rondeletia** (which *see*).

LIGNEOUS. Woody.

LIGULARIA includes *Erythrochæte*, the correct name of *E. palmatifida* being *L. japonica.* To the species described on p. 263, Vol. II., the following should be added:

L. Hodgsoni (Hodgson's). *fl.-heads* deep bright yellow, 2½in. across; involucre turbinate. July. *l.*, radical ones long-petiolate, large, cordate or roundish, repandly lobed, serrate-toothed; cauline ones gradually reduced to bracts. Stem thick, succulent, 3ft. or more in height. Japan, 1863. (B. M. 5417.)

LIGUSTRINA. Included under **Syringa** (which *see*), the correct name of *L. amurensis* being *S. japonica.*

LIGUSTRUM. To the species, &c., described on pp. 263-4, Vol. II., the following should be added:

L. brachystachyum (short-spiked). A synonym *L. Quihoui.*

L. coriaceum (leathery). *fl.* white, with a yellowish tinge, in globose, terminal and lateral clusters or heads on a panicle 2in. to 4in. long. June. *l.* 2in. to 2½in. long, orbicular or orbicular-ovate, with a narrow, reddish-purple border; petioles short and stout. *h.* 3ft. to 6ft. Japan, 1860. A rigid, closely-branched, half-hardy, evergreen shrub. (B. M. 7519; F. & P. 1876, t. 65; R. H. 1874, p. 418, f. 56.) SYN. *L. lucidum coriaceum.*

L. japonicum Alivoni (Alivon's).* *l.* ovate-lanceolate, acuminate, entire, narrowed at base, wavy-margined, dark green, shining, irregularly variegated pale yellowish. 1886. A robust, garden variety.

L. lucidum coriaceum is synonymous with *L. coriaceum.*

L. l. tricolor (three-coloured). *l.* prettily marked with yellow, pink when young, but not so hardy as the type.

L. l. Triomphe de Bordeaux. *l.* rich glossy green. Habit branching. Other forms are *Alivoni* and *sinense.*

L. medium (intermediate). *fl.* white, small, disposed in terminal panicles. *l.* broadly lanceolate, acute. Japan, 1891. A hardy shrub or small tree.

L. nepalense (Nepal). The correct name of *L. spicatum.*

L. ovalifolium instabile (unstable). *l.* alternate, opposite, or in whorls of three. 1878.

L. Roxburghii (Roxburgh's). A synonym of *L. japonicum.*

L. sinense nanum (dwarf).* *fl.* small, odorous, in abundant bunches. *l.* closely set, ovate, undulated. 1875. A dwarf, much-branched, compact form.

L. strongylophyllum (Strongylus-leaved). *fl.* white, in rather loose panicles. *l.* orbicular or obovate, ½in. to 1in., almost glabrous. China. An evergreen shrub or small tree.

L. Walkeri (Walker's). *fl.* disposed in a large, compound, minutely pubescent panicle; corolla tube hardly as long as the calyx. *l.* elliptic, acuminate, with slender, irregular nerves. Ceylon, Neilgherries, &c. (up to 5000ft. elevation), 1898. (G. C. 1898, ii., p. 232, f. 82.)

LILIAGO. Included under **Anthericum** (which *see*).

LILIASTRUM. A synonym of **Paradisia** (which *see*).

LILIUM. Including *Martagon* and *Notholirion.* Comparatively few new species of *Lilium* have to be recorded since the issue of the work proper. Those, however, which have been introduced are most desirable additions to the lists of hardy herbaceous subjects. In *L. Grayi* the gardener has a remarkably fine species allied to the *L. canadense* section, and like them, requiring for its successful culture a moist, peaty soil. No less desirable is *L. rubellum* (Fig. 520), lovely as to colour and sweet as to flower. This latter is best

Lilium—*continued.*

FIG. 517. LILIUM BROWNII.

grown in a light, rich soil. It is also a first-class pot-Lily. If species have been few, varieties have been particularly numerous, and the more noteworthy of these will be found described below.

For general purposes the best kinds are to be found in *L. candidum* (despite the fact that this is attacked in some seasons by a *Botrytis*-form), *L. croceum*, *L. Martagon*, *L. umbellatum* and its varieties, *L. pyrenaicum*, *L. Henryi*, *L. tigrinum* and varieties, *L. Brownii* (Fig. 517), *L. elegans* (*Thunbergianum*, Fig. 518), *L. Hansoni*, *L. speciosum Krætzeri*, and *L. auratum platyphyllum*.

For pot culture the most useful are *L. longiflorum*, *L. l. Harrisii* (Bermuda or Easter Lily), *L. l. robustum*, *L. candidum*, *L. auratum* (Fig. 519) and its varieties, *L. speciosum*, *L. Henryii*, *L. nepalense*, *L. sulphureum*, *L. umbellatum* and its varieties, *L. elegans* and its varieties, and *L. rubellum*.

A point to bear in mind in cultivating Lilies is to disturb them as little as possible; this may be done by affording top-dressings of soil annually. If it be absolutely necessary to transplant any, care should be taken that this is done at the proper season—as soon as the stems have died down—say from late August onwards till October. With the species and varieties at command, and the method of retarding the bulbs now adopted, it is possible to have Lilies all the year round. Indeed, in the outdoor garden, one variety or another may be had in flower from the end of May until October, and later in some districts and seasons.

PESTS. Lilies, although they cannot boast an immunity from pests, are singularly free from them. There are, however, one or two species which are affected by fungoid diseases—for instance, *L. auratum* and *L. speciosum* are attacked by *Rhizopus necans*, and *L. candidum* by a *Botrytis*-form of *Sclerotinia*. Both diseases are very destructive, and call for vigorous measures. The first

Lilium—*continued.*

is thought to be induced by the bulbs being shipped from Japan at the wrong season—during the sultry, moist weather incidental to the summer of that country—instead of in autumn (October), when the soil is dry, and the bulbs are properly matured. From this it would seem that the remedy lay rather with the exporter than with the grower, who maybe is anxious to get the bulbs on the market irrespective of season. Again, the conditions under which the bulbs are shipped to this country are those conducive to the spread of the disease, by causing them to "sweat."

If, as was suggested some time back in the "Gardeners' Chronicle," a method of cold storage were adopted, the disease now so fatal might be reduced to a minimum. Being, however, a wound-fungus, the disease is readily contracted, as it has been conclusively shown that it lives as a saprophyte in the soil. Bulbs affected with the disease show signs of discoloration, which gradually spreads until they become absolutely rotten, and then disclose the white mycelium.

In the "Kew Bulletin," for 1897, Mr. Massee deals at length with this disease, and illustrates its various phases. He moreover suggests that as a means of prevention, bulbs intended for export should be first subjected to a 1 per cent. solution of salicylic acid for twenty minutes, and afterwards well dried. This would destroy the spores of the fungus. Further preventive measures consist in burning all rotten bulbs.

The other species of fungus attacks all parts of the plant above the soil, and is particularly destructive to the flower-buds, causing them to rot. This disease is most injurious during wet, damp weather—conditions favourable to its development. Minute rusty spots are usually first noticed upon leaves and flower-buds, and

FIG. 518. LILIUM THUNBERGIANUM.

Lilium—*continued.*

these increase in size. The area over which the disease extends also increases, and eventually the buds decay, and a greyish-white mycelium is produced which darkens with age. In course of time the plant succumbs; but this does not mean the death of the fungus, as, prior to this taking place, irregularly-shaped, shiny black bodies, known as *Sclerotia*, have been produced. By means of these the fungus is tided over the winter, as they are impervious to the severest weather, and only need the advent of spring to start the disease afresh. In this case all infected plants should be burned, and the quarters set apart for the culture of the plants should be changed.

FIG. 519. LILIUM AURATUM.

Rats and mice are very partial to Lily bulbs, and especially to *L. auratum*; while Aphides and the Bulb-mite (*Rhizoglyphus Robini*), which latter penetrates the scales, do considerable damage at times if undetected. Warm water, in which a table-spoonful of paraffin to the pint has been added, would probably prove of service in ridding the bulbs of Mite; but the solution must be kept stirred.

To the species and varieties described on pp. 266-74, Vol. II., the following should be added:

L. Alexandræ (Alexandra's). A form of *L. Brownii*.

L. alpinum (alpine). A synonym of *L. parvum*.

L. auratum platyphyllum (broad-leaved).* *fl.* richly spotted with brown, very large, often over 12in. wide. *l.* very much broader than in the type.

L. a. p. virginale (virgin-white).* *fl.* white, banded yellow, the petals being slightly spotted with the same colour; anthers dark coloured. 1882.

L. a. rubro-vittatum (red-striped).* A magnificent variety, having a red band in the centre of each petal. Easy to grow

Lilium—*continued.*

L. a. Wittei (Witte's).* *fl.* pure white, unspotted, and having a central band of yellow, the petals sometimes tinged with pink. Very distinct and beautiful.

L. beerensis (Beer). A garden hybrid between *L. chalcedonicum* and *L. excelsum*. 1895.

L. Biondii (Biondi's). A scarlet-flowered, linear-leaved species, nearly allied to, or perhaps identical with, *L. sutchuenense*. 1896.

L. Bolanderi (Bolander's).* *fl.* one to four; perianth purplish-red, dotted with blood-red on the inside, campanulate, pendent; segments lanceolate. *l.* whorled, bluish-green. Stem purplish. *h.* 1ft. to 3ft. California, 1889. (Gn. 1890, ii. 776.) Resembles *L. Grayi* in flower.

L. Brownii (Brown's). The correct name of the *L. japonicum*, described in Vol. II. See Fig. 517.

L. B. Alexandræ (Alexandra's). *fl.* pure white, more open than in the type, and with a longer style. Japan, 1893. (G. C. 1893, xiv., pp. 86, 243, f. 44.) SYN. *L. Ukeyuri*.

L. B. Colchesteri (Colchester's).* *fl.* pale yellow, fading to creamy-white, streaked outside with reddish-brown, very fragrant. Under glass this Lily comes a creamy-yellow.

L. B. leucanthum (white-flowered). *fl.*, perianth having no tinge of red on the outside and marked with yellow inside; tube less distinctly trumpet-shaped than in the typical *Brownii*. *l.* broader. Western China, 1894. A distinct form.

L. B. viridulum (slightly-greenish). *fl.* creamy-white, tinged on the outside with yellowish-green, having only a faint dash of claret-brown. Japan, 1885.

There are several other forms of *Brownii*, including *Chloraster*.

L. Burbanki (Luther Burbank's). *fl.* clear orange-yellow, purple spotted, very sweet-scented. Vigorous and free-flowering. A hybrid between *L. pardalinum* and *L. Washingtonianum*, but not so recurved as to blossom as the former.

L. californicum (Californian), of gardens. A synonym of *L. puberulum*.

L. camschatcense (Kamtschatkan). A synonym of *Fritillaria camschatkense*.

L. canadense flavum (yellow). *fl.* soft yellow, spotted deep crimson. Very effective.

L. c. rubrum (red). *fl.* red outside and yellow inside, spotted with black.

L. candidum. The forms *argenteo-variegatum* and *aureo-variegatum* have variegated leaves.

L. chalcedonicum. Other varieties are: *maculatum*, *Heldreichii*, and *pyrenaicum*.

L. chinense (Chinese). A scarlet-flowered, linear-leaved species, nearly allied to *L. sutchuenense*. 1896.

L. columbianum lucidum (clear). *fl.* bright golden-yellow, spotted with brown, agreeably scented, nodding, with recurved segments. *l.* dark, glossy green, lanceolate or ovate, alternate below and verticillate above. Stem 3ft. to 4½ft. high, green or greenish-purple. Bulb rather small, with narrow, sharply-pointed scales. California.

L. concolor luteum (yellow). *fl.* yellow, spotted purplish-red. China and Japan, 1877.

L. croceo-elegans (hybrid). A hybrid between the species indicated in the name. 1893.

L. dalhansoni (hybrid).* A fine hybrid between *L. Martagon dalmaticum* and *L. Hansoni*. 1893.

L. dauricum [the correct spelling]. This species is often confused with *L. umbellatum*.

L. elegans Alice Wilson.* *fl.* of a lemon-yellow tint. A beautiful, dwarf variety, but rare.

L. e. alutaceum Prince of Orange. *fl.* apricot-orange, spotted with black. 1ft.

L. e. Batemanniæ (Mrs. Bateman's). *fl.* rich dark yellow, three to twelve to a stem. *h.* 4ft. Japan, 1899.

L. e. Beauty. *fl.* brilliant orange, shaded red. *h.* 2ft.

L. e. biligulatum (biligulate). *fl.* bright orange, with many purple spots in the middle of the segments.

L. e. cruentum (bloody). *fl.* of a deep blood-crimson, mottled and streaked with a deeper shade. 1882. One of the finest of the group.

L. e. E. L. Joerg. *fl.* bright crimson, streaked with yellow. Late flowering and distinct.

L. e. flore-pleno (double-flowered). *fl.* having the stamens transformed into petal-like organs, imparting a double appearance to the flower.

L. e. Horsmanni (Horsmann's).* *fl.* of a rich mahogany-red; scarce.

L. e. marmoratum (marbled) and **L. e. m. aureum** (golden). Two of the earliest-flowering varieties.

Lilium—*continued.*

L. c. Orange Queen.* *fl.* bright orange, with dark spots, large, and of good substance. *h.* 1ft. One of the best.

L. c. ornatum (ornate). *fl.* bright orange-yellow, spotted with black. Very early.

L. c. Othello. *fl.* blood-red, with orange tinge. A showy form.

L. c. robustum (robust). *fl.* deep orange, marked all over with small spots of dark brown, large and handsome. 1882.

L. c. splendens (splendid). An early variety.

FIG. 520. LILIUM RUBELLUM.

L. c. The Sultan.* *fl.* deep crimson. An effective variety.

L. c. Van Houttei (Van Houtte's). *fl.* of a deep crimson, with black spots. *h.* 2½ft.

L. c. venustum s identical with *L. c. armeniacum.*

L. c. v. macranthum (large-flowered). *fl.* clear orange.

L. c. Wallacei (Wallace's). *fl.* spotted with brown, usually solitary. Bulbs stoloniferous. *h.* 2½ft. Japan, 1889.

L. c. Wilsoni (Wilson's). *fl.* of an Apricot colour, with yellow stripes. *h.* 2ft. A late variety.

L. Elizabethæ (Elizabeth's). A synonym of *L. Krameri.*

L. formosum (beautiful). A synonym of *L. elegans.*

L. Fortunei (Fortune's). *fl.* disposed in a paniculate raceme; perianth orange-yellow, spotted with dark brown; segments unguiculate. *l.* linear, drooping. *h.* 1½ft. to 2ft. Japan, 1862.

L. Grayi (Gray's).* *fl.* often solitary, ascending or somewhat nodding; perianth deep reddish-orange, spotted within, 1½in. to 2in. long, the segments oblanceolate, abruptly acute, not recurved. *l.* four to eight in a whorl, lanceolate, acute, not scabrous. Alleghany Mountains, 1883. Allied to *L. canadense.* (B. M. 7234; G. & F. 1888, i., p. 19, f. 4.) A splendid species.

L. Henryi (Dr. Henry's).* *fl.* four to twenty in a large, lax corymb; perianth yellow, dotted in the lower part with reddish-brown, 3in. to 3½in. long. *l.* closely set, lanceolate, 6in. to 8in. long. *h.* 5ft. to 6ft. Ichang, China, 1890. (B. M. 7177; G. C. 1890, ii., f. 75; Gn. 1891, 830.) A handsome and vigorous species.

L. Humboldtii magnificum (magnificent).* *fl.* deeper in colour than in the type, and heavily spotted, the petals being tinged with purple. *h.* 4ft. to 5ft. Very free.

L. japonicum. Recent investigations prove that the true *L. japonicum* is a plant which goes under the name of *L. Krameri* (of Hooker). The *L. japonicum* described in Vol. II. is *L. Brownii.*

L. lancifolium (of gardens). A synonym of *L. speciosum.*

L. longiflorum (long-flowered). In addition to the form *eximium,* which is probably the finest, there are several others, including *albo-marginatum* (variegated-leaved), *formosanum, giganteum,* MADAME VON SIEBOLD, *præcox, Takesima,* and *Takesima grandiflora. Wilsoni* is identical with *eximium.*

L. Lowii (Low's).* *fl.* corymbose or umbellate; perianth white, or greenish outside, speckled with claret-brown below, 3in. to 4in. long, recurved from the middle. *l.* numerous, linear, sessile, 2in. to 3in. long. *h.* 2ft. to 3ft. Birma, 1891. (B. M. 7233; Gn. 1894, i. 953.

L. lucidum (clear). A synonym of *L. columbianum.*

Lilium—*continued.*

L. Marham (hybrid).* A beautiful hybrid between *L. Martagon album* and *L. Hansoni,* and having orange flowers with reddish spots and streaks. *h.* 6ft. Excellent for pots.

L. maritimum (sea-loving). Coast Lily. *fl.* reddish-orange, with purplish spots, nodding, one to six in a corymb; perianth 1¼in. to 1½in. long, the segments slightly revolute; peduncles 2in. to 5in. long, ascending. July. *l.* scattered thinly on the upper part of the stem, but crowded below, occasionally whorled, 1in. to 5in. long. Stem 1½ft. to 3ft. high. California.

L. Martagon. Of this species there are now several varieties, including *album* (white), *atrosanguineum* (dark purple), *dalmaticum* (Dalmatian), *flore-pleno* (double-flowered), and *villosum* (villous-budded).

L. monadelphum. In addition to *Szovitsianum,* there are one or two other forms, including *colchicum* and *Loddigesianum.*

L. nepalense ochroleucum (yellowish-white). *fl.* golden-yellow. 1890.

L. ochroleucum (yellowish-white). A garden synonym of *L. sulphureum.*

L. oxypetalum. The correct name is *Fritillaria oxypetala.*

L. pardalinum Johnsoni (Johnson's). This is more intense as to colour and taller than the type. British Columbia.

L. p. luteum (yellow). *fl.* Indian yellow, spotted with brown. 1889.

L. p. Michauxii (Michaux). *fl.* crimson-scarlet, shading to yellow, spotted with a deeper colour. *h.* 4ft. Late-flowering.

L. p. pumilum (dwarf). A garden hybrid between *L. pardalinum* and *L. parvum.* 1889.

L. p. Warei (Ware's). *fl.* varying from lemon to orange-yellow, unspotted, smaller than in the type. *l.* shorter and more cordate. Lower California, 1886.

L. Parkmanni (Parkmann's).* A beautiful hybrid between *L. speciosum* and *L. auratum.* 1865.

L. parvum (small). This is now regarded as a species, and not as a variety of *L. canadense.* SYN. *L. alpinum.*

L. primulinum (Primrose-yellow). *fl.* about three in a corymb or umbel, on long pedicels; perianth pale yellow, unspotted, 5in. to 6in. long, funnel-shaped, the segments revolute in the upper half. *l.* lanceolate, 3in. to 4in. long. Stem 3ft. to 4ft. high, erect. Shan States, Birma, 1892. Greenhouse or half-hardy. (B. M. 7227.)

L. puberulum (puberulous).* Of Torrey and Duchr. *fl.* bright orange-red, thickly spotted, from six to ten in a large panicle; segments strongly reflexed. Summer. *l.* in large whorls. *h.* 3ft. to 4ft. California. This species has close affinity to *L. Humboldtii,* from which it chiefly differs in having the stem and under-surface of the leaves puberulous. A stately species. SYN. *L. californicum* (of gardens).

L. puberulum (of gardens) is a synonym of *L. pardalinum pallidifolium.*

L. rubellum (reddish). *fl.* one or two, oblique; perianth clear red, unspotted, about 3in. in diameter; segments lanceolate-oblong, obtuse. *l.* bright green, 2in. long, lanceolate. Bulb globular. Japan, 1898. Allied to *L. japonicum.* (B. M. 7634; G. C. 1898, i., p. 231.) See Fig. 520.

FIG. 521. LILIUM SPECIOSUM ALBUM.

Lilium—*continued.*

L. speciosum album (white). *fl.* pure white or faintly tinged with pink. There is a sub-variety *corymbiflorum*, with more numerous flowers. See Fig. 521.

L. s. a. Krætzeri (Krætzer's).* *fl.* pure white. One of the finest Lilies in cultivation.

L. s. Melpomene (Melpomene).* *fl.* rich, bright crimson, 8in. across, the perianth segments margined with white, richly spotted. *l.* very broad. 1882.

L. s. rubrum (red). *fl.* of a beautiful rose-colour, washed with carmine and with purple spots.

L. sulphureum (sulphur-coloured). *fl.* fragrant, pendent, on long pedicels; perianth pale sulphur-yellow, suffused with claret-colour outside, 7in. to 8in. long, recurved in the upper half. *l.* very numerous, 3in. to 4in. long, ½in. broad, linear; upper ones bulbiferous. Stem 6ft. to 7ft. high. Upper Birma, 1892. Greenhouse or half-hardy. (B. M. 7257; R. H. 1895, p. 554, f. 173.) SYNS. *L. ochroleucum* and *L. Wallichianum superbum* (of gardens).

L. sutchuenense (Sutchuen). A species with large, bright-red flowers and narrow leaves, allied to *L. Maximowiczii*. 1896. It has been erroneously called *L. szechnense* in gardens.

L. szechnense. *See* **L. sutchuenense.**

L. tigrinum jucundum (pleasant). *fl.* cinnabar-red, black-dotted below; filaments and style orange; anthers chocolate-red. Japan, 1876.

L. Ukeyuri (Japanese name). A synonym of *L. Brownii Alexandræ*.

L. umbellatum (umbellate). Under this name, of garden origin, are grouped a number of beautiful Lilies, frequently, but wrongly, classed as forms of *L. dauricum*. The best are: *atro-sanguineum, erectum, fulgidum, grandiflorum*, INCOMPARABLE, *maculatum, multiflorum*, SAPPHO. The flowers are some shade of red, with spots, and are produced in June. They vary in height from 2ft. to 3ft., and are largely and effectively employed in shrubberies.

L. Wallichianum superbum (superb). A garden synonym of *L. sulphureum*.

LILY DISEASE. A popular name for the fungoid disease affecting *Lilium candidum*. *See* **Lilium—Pests.**

LILY OF THE VALLEY. So far as the forcing of this lovely flower is concerned great advances have been made, owing to the introduction of what are known as retarded crowns. By means of these it is possible to have blossoms at seasons—before Christmas—that before were quite out of the question. Apart, too, from that, such crowns give finer flowers and healthy and abundant foliage. The treatment necessary for such crowns is

FIG. 522. FORTIN'S LILY OF THE VALLEY.

Lily of the Valley—*continued.*

to pot them up in the ordinary way, after which they should be kept in a cool frame for four days, and then transferred to a greenhouse where a temperature of 55deg. to 60deg. can be maintained.

For outside culture an improved strain of Lily of the Valley has been introduced with larger and finer flowers than those previously known. The variety is known as Fortin's (see Fig. 522), and the flowers are produced on exceptionally long stalks.

LILY PINK. *See* **Aphyllanthes.**

LIMATODES LABROSA. A synonym of **Calanthe labrosa** (which *see*). *L. rosea* is a synonym of **C. rosea.**

LIME APHIS (*Pterocallis tiliæ*). *See* **Aphides.**

LIMIA. A synonym of **Vitex** (which *see*).

FIG. 523. LIMNANTHEMUM NYMPHÆOIDES.

LIMNANTHEMUM. *L. indicum* (Water Snow-flake) is known in gardens as *Villarsia Humboldtiana*, and *L. nymphæoides* (Fig. 523) is also called *L. peltatum*. To the species described on p. 277, Vol. II., the following should be added:

L. lacunosum (lake-loving). *fl.* white; corolla lobes broadly ovate, naked except the crest-like yellowish gland at their base, twice as long as the calyx lobes. Summer. *l.* entire, roundish-cordate, 1in. to 2in. broad, thickish; petioles filiform. Northern United States. SYNS. *Villarsia cordata, V. lacunosa.*

L. trachyspermum (rough-seeded). Fairy Water Lily. *fl.* white, larger and of stouter texture than those of *L. lacunosum*. June. *l.* cordate, orbicular, thick, entire, or repand. North America.

LIMNANTHES. To the species described on p. 277, Vol. II., the following should be added:

L. alba (white). *fl.* almost white or bright rose at summit, rather large; calyx hairy; peduncles slender, 4in. long. July. *l.* glabrous, pinnatifid; segments narrow, mucronate; radical leaves tufted. *h.* 6in. to 12in. 1843.

LIMNETIS. A synonym of **Spartina** (which *see*).

LIMNOBIUM (from *limne*, a marsh, and *bios*, life). ORD. *Hydrocharideæ*. This is the correct name of the genus described on p. 77, Vol. IV., under its old name **Trianea.**

LIMNOCHARIS. The following changes in nomenclature may be noted:

L. emarginata (emarginate). The correct name of *L. Plumieri.*

L. Humboldtii (Humboldt's). A synonym of *Hydrocleys Commersonii.*

LIMNONESIS. A synonym of **Pistia** (which *see*).

LIMNOPHYTON (from *limne*, a marsh, and *phyton*, a plant; in allusion to the positions in which the plant is found). SYN. *Dipseudochorion*. ORD. *Alismaceæ*. A monotypic genus. The species, *L. obtusifolium* (SYN.

Limnophyton—*continued.*

Sagittaria obtusifolia), is an erect, succulent, marsh plant, native of tropical Asia and Africa, with the characters of *Alisma*, but having polygamous flowers. It has been introduced, but is of little horticultural value.

LIMODORUM. Several species of Orchids formerly known by this name are now referred to **Angræcum, Bletia, Calopogon, Cymbidium, Cyrtopera, Eulophia,** and **Phaius.**

LIMONIA MONOPHYLLA. A synonym of **Atalantia monophylla** (which *see*). *L. Laureola* is identical with **Skimmia Laureola.**

LIMONIASTRUM. *L. articulatum* is the correct name of *L. monopetalum.*

LINAGROSTIS. A synonym of **Eriophorum** (which *see*).

LINANTHUS. Included under **Gilia** (which *see*).

LINARIA. Including *Chænarrhinum* (sometimes erroneously spelt *Chænorrhinum*). To the species and varieties described on pp. 278-9, Vol. II., the following should be added:

L. alpina rosea (pink). A pale pink form of the beautiful type.

L. anticaria (southern). The flowers of this are variously coloured and marked. The plant is very dwarf, and is a capital subject for old walls, &c. Spain. Biennial or perennial.

L. antirrhinifolia (Snapdragon-leaved). A garden synonym of *L. Cavanillesii.*

L. antirrhinoides (Snapdragon-like). A synonym of *L. Cavanillesii.*

L. aparinoides (Aparine-like). A synonym of *L. heterophylla.*

L. bipartita alba (white)* is a pretty, pure white form, with deep yellow blotches. There are also pink (Queen of Roses) and deep purple (*splendida*) varieties.

L. Broussonetii (Broussonet's). *fl.* citron-yellow, orange at the throat, dotted with brown; corolla as large as in *L. alpina*; spur straight; spikes terminal, erect. Summer. *l.* linear or linear-lanceolate; lower ones quaternate. Spain, &c. A procumbent or ascending annual. SYN. *L. multipunctata.*

L. B. erecta (erect). Stems erect, forming a compact tuft.

L. Cavanillesii (Cavanilles').* *fl.* bright purple, very freely produced in spikes. Summer and autumn. *l.* mostly ternately whorled, obovate, slightly petiolate. *h.* 6in. to 8in. Spain, 1897. Plant villous. A very pretty annual for the rockery. SYNS. *L. antirrhinifolia* (of gardens), *L. antirrhinoides.*

L. Cymbalaria alba (white).* A white-flowered variety of the type. *h.* 3in.

L. C. maxima (greatest).* *fl.* twice the size of the ordinary Ivy-leaved Snapdragon, fragrant. *l.* not quite so large, highly pubescent. 1882. SYN. *L. pallida.* The typical species is commonly known as Pennyleaf or Pennywort, and also as Kenilworth Ivy.

L. heterophylla splendens (splendid). *fl.* crimson, with a large, golden centre. 1888. Other similar varieties are *aureopurpurea* and *purpurea.*

L. macedonica (Macedonian).* *fl.* yellow; corolla nearly 1in. long, equalling the flexuous spur; raceme loose. *l.* sparse, glaucescent, rather broad at base, sessile, ovate-lanceolate, shortly acuminate. Macedonia. Annual, woody below. (Gn. 1894, i., 948.) Though given as a distinct species by many, this is probably but a wide-leaved variety of *L. dalmatica.*

L. maroccana hybrida (hybrid). *fl.* varying in colour from rose to red and from lilac to violet, the lower petal being usually white; spikes terminal. Branches slender, upright. *h.* 1ft.

L. multipunctata (many-dotted). A synonym of *L. Broussonetii.*

L. pallida (pale). A synonym of *L. Cymbalaria maxima.*

L. pilosa (pilose). *fl.* pale purplish-blue, with a yellow palate and a rather incurved spur; calyx pilose. June to September. *l.* opposite and alternate, cordately rounded or reniform, villous, five- to eleven-lobed, the lobes mucronulate. Branches creeping, white-hairy. Italy, &c., 1800.

L. p. longicalcarata (long-spurred). In this variety the spur of the pale purplish flower is as long as the tube. (R. G. 1135, f: 3.)

L. triornithophora carnea (flesh-coloured). A pink variety of the type *h.* 1½ft.

LINDELOFIA. To the species described on p. 280, Vol. II., the following should be added:

L. longifolia (long-leaved). *fl.* bright blue, like Forget-me-nots, borne in scorpioid cymes. May. *l.* lanceolate. *h.* 2ft. to 2½ft. 1888. This is probably identical with, or a variety of, *L. spectabilis.*

LINDENIA. To the species described on p. 280, Vol. II., the following should be added:

L. vitiensis (Fiji). *fl.*, corolla cream-coloured, silky-tomentose, the tube very long and slender, the segments ovate-oblong, obtuse; anthers and pistil projecting. *l.* oblong-lanceolate, glabrous, 4in. to 6in. long, 1in. to 1½in. broad; petioles and lower part of the midrib purplish. *h.* 3ft. to 4ft. Fiji, 1884. A highly ornamental shrub.

LINDERA includes *Euosmus* or *Evosmus.*

LINDNERA FIBRILLOSA. A synonym of **Pseudogaltonia Pechuelii** (which *see*).

LINDSAYA. If the species of *Lindsaya* are more extensively represented in herbaria than in gardens, it is not on account of their deficiency in good qualities, but rather to the difficulties with which their importation is usually beset. Time after time, some of the most beautiful representatives of the genus have arrived in Europe, and to all appearances in good condition, but from some inexplicable cause they have just as frequently died. Lately, however, owing to their being differently treated, some of the most interesting kinds have been established in this country. These, when taken from the packing-cases, were placed in pots nearly filled with crocks, in which they were firmly held by two or three pieces of turfy loam. In this way cultivators are imitating their natural mode of growth, for this class of Fern is generally found with the creeping rhizomes running in and about a poor, stony soil, frequently drenched with rain, and therefore often carried away and leaving very little soil to stagnate about the roots. All of them, too, revel in a humid atmosphere, and under cultivation do well if treated as Filmy Ferns; but they need a higher temperature. Several of the species bear considerable resemblance to certain Adiantums, while others are more like Davallias; but in all instances their stalks, which are light-coloured, lack the black, polished appearance peculiar to those of most of the Maidenhair Ferns.

FIG. 524. LINDSAYA MICROPHYLLA.

Although they require an abundance of water at the roots, perfect drainage for Lindsayas cannot be too strongly insisted upon, for they suffer considerably from the effects of stagnant water—as much, in fact, as from the want of atmospheric humidity. When properly established, these plants should be potted in a mixture of two parts turfy loam and one part fibrous peat, with just a dash of sand; and only a little of this mixture should be used in each pot, the greater part of which should be filled with drainage materials. They should then be either set on, or, better still, plunged in, a bed of sphagnum, kept close, and occasionally sprinkled overhead. Nearly all the species thrive fairly well under such treatment, although a few members of the genus, notably those native of New Zealand, such as *L. linearis*, *L. microphylla* (see Fig. 524), and *L. trichomanoides*, need a little less heat. The majority of them, however, come from warmer climes—the East and the West Indies,

Lindsaya—*continued.*

Tropical America, &c.—where they grow either in or on the margin of the woods and under the shade of large forest trees, close to running streams, where the atmosphere is constantly humid and warm.

Lindsayas are usually propagated by the division of their crowns or of their rhizomes. We have no record of any of them having been raised from spores in this country, unless it be of *L. retusa* of Mettenius, which has been fully described as *Davallia retusa*, the name first given to it by Cavanilles, subsequently confirmed by T. Moore, and under which the plant is also extensively known in European gardens.

FIG. 525. FRONDS OF LINDSAYA CULTRATA.

To the species described on pp. 280-1, Vol. II., the following should be added:

L. cultrata.* This elegant species is found in the East Indies, Java, Ceylon, Luzon, the Philippines, and Queensland. Fronds are shown in Fig. 525.

L. davallioides (Davallia-like). *rhiz.* short-creeping. *sti.* firm, erect, 6in. to 12in. long. *fronds* formed of a long central point and two or three pairs of curved branches 4in. to 8in. long; pinnæ having their lower margin straight or slightly curved, and the upper one with four to six regular, rounded but not deep lobes, placed close together but not overlapping. *sori* uniformly disposed on the margins of the lobes. Malaya. SYN. *Davallia Kunzeana* (of gardens).

L. Griffithiana (Griffith's). A synonym of *L. ensifolia*

FIG. 526. FROND OF LINDSAYA GUIANENSIS.

L. guianensis.* The general appearance of this plant partakes very much of the habit of a good-growing Davallia; it is also very attractive on account of its lively-green colour. See Fig. 526.

L. Kirkii (Kirk's).* *sti.* stout, nearly upright, 1ft. to 2ft. long. *fronds* 1ft. to 2ft. long, 6in. to 9in. broad, thin, formed of a long unbranched point and six to nine branches on each side 6in. to 9in. long; pinnules overlapping, much decurved at base, the outer edge rounded, the upper ones notched. *sori* abundantly disposed round the upper edge. Seychelles. A distinct and handsome species.

Lindsaya—*continued.*

L. Leprieurii (Leprieur's). A synonym of *L. trapeziformis.*

L. Lowii (Low's). A synonym of *Acrostichum sorbifolium.*

L. pentaphylla (five-leaved). A synonym of *L. ensifolia.*

L. retusa (retuse).* *rhiz.* close-growing, underground. *sti.* smooth, erect, crimson, 1ft. long. *fronds* elongated-triangular, 2ft. to 3ft. long, 1½ft. broad, tripinnate; pinnules rhomboidal. *sori* on the dilated extremities of the margins of the pinnules. Sumatra. An excellent Fern for hanging-baskets. SYN. *Davallia retusa.*

L. trapeziformis. Of this species there are three varieties *caudata, laxa,* and *L'Herminieri.*

LINE. *See* **Measurements.**

LINEATE. Marked with fine, parallel lines, usually coloured. Lineolate is the diminutive of Lineate.

LINGUIFORM. Tongue-shaped.

LININGS or COATINGS. Before the use of hot-water for heating became so general, hot-beds from strawy manure were relied upon largely to afford heat for early supplies of salads, &c., and after a heavy fall of snow or rain the heat of the fermenting material would fall considerably. In such cases the addition of a good Lining of fresh fermenting gave a stimulant to the falling temperature, and prevented a collapse of the crop growing on the bed.

LINKIA (of Cavanilles). A synonym of **Persoonia** (which *see*).

LINKIA (of Persoon). A synonym of **Desfontainea** (which *see*).

LINNEAN SYSTEM. The sexual system of botany introduced by Linnæus, who divided the Vegetable Kingdom into twenty-four classes, mostly according to the number and disposition of the stamens, the last being the *Cryptogamia*, or flowerless plants.

LINOSPADIX (from *linea*, a thread of flax, and *spadix*, a Palm branch; the axis of the inflorescence is slenderer than in most Palms). ORD. *Palmæ.* A small genus (three species) of dwarf, unarmed, stove Palms, closely allied to *Howea*, natives of New Guinea. Flowers minute, monœcious on a simple spadix; spathes two, remote, marcescent. Fruit red or yellow, small, ellipsoid. Leaves terminal, flabelliform, and deeply bifid or pinnatisect. For culture of the best-known species (described below), *see* **Calamus.**

L. Micholitzii (Micholitz'). This is described as "unique in the genus in being quite stemless, the wedge-shaped leaves rising erect from the ground in a large tuft. They are upwards of 4ft. long, narrow at the base, broadening upwards, ending in a pair of long, acute points." (Ridley, of Singapore, in G. C. 1895, xviii., p. 262.) 1896.

L. Petrickiana (Petrick's).* *l.* bright green, produced in rapid succession while the plant is in a young state; leaflets long and narrow. 1899. A neat little Palm.

LINOSPADIX (of H. Wendland). A synonym of **Bacularia** (which *see*).

LINOSYRIS. Included under **Aster** (which *see*). *L. Howardii* is a synonym of **Bigelovia Howardii.**

LINUM. Including *Cliococca.* Four species are included in the British Flora—*L. angustifolium, L. catharticum, L. perenne,* and *L. usitatissimum.* To the species, &c., described on p. 282, Vol. II., the following should be added:

L. austriacum album (white). A pure white variety of the well-known type.

L. Chamissonis is the correct name of *L. Macræi* (of Bot. Mag.). The true *L. Macræi* is probably not in cultivation.

L. grandiflorum coccineum (scarlet).* *fl.* bright crimson-rose. *h.* 1ft. One of the finest hardy annuals.

L. g. kermesinum (crimson). This is a pretty variety with crimson flowers.

L. pubescens (downy). *fl.* pink, thrice as long as the calyx; cymes usually compound. *l.* three- to five-nerved; lower ones oblong, obtuse; upper ones oblong-lanceolate, acute. Asia Minor. A more or less bristly-hairy, hardy annual.

L. p. Sibthorpianum (Sibthorp's). *fl.* pink, blue, and yellow. Silesia, 1887.

L. sibiricum is a form of *L. perenne.*

L. suffruticosum (sub-shrubby). A synonym of *L. salsoloides.*

LINYPHIA. *See* **Spiders.**

LIP. The labellum in Orchids; one of the divisions of a labiate calyx or corolla.

LIPARIS. Including *Gastroglottis.* To the species described on p. 283, Vol. II., the following should be added:

L. bituberculata (two-tubercled). The correct name of *L. formosana.*

L. cylindrostachys (cylindrical-spiked). A synonym of *L. longipes.*

L. decursiva and **L. foliosa** are, according to the "Index Kewensis," merely forms of *L. reflexa.*

L. elegans (elegant). *fl.*, sepals and petals pale greenish; lip orange-red; raceme many-flowered; scape 1ft. to 1½ft. high. *l.* 3in. to 8in. long, linear-lanceolate, acute. Pseudo-bulbs ovate, one- to three-leaved. Penang, 1886.

L. fulgens (brilliant).* *fl.* of a uniform deep red; sepals, petals, and lip ¼in. to ½in. long, the apex of the lip divided into a pair of crenulate lobes; raceme 5in. long, bearing about twenty-five flowers. *l.* linear-lanceolate, 5in. to 6in. long. Pseudo-bulbs 2in. long. Philippines (?), 1889.

L. grossa (thick). *fl.* yellowish-brown, many in a raceme; sepals and lip ligulate. *l.* broadly-ligulate, obtuse. Pseudo-bulbs short, stout, pyriform, two-leaved. Birma, 1883.

L. latifolia (broad-leaved). *fl.* ochre; sepals oblong-ligulate, the lateral ones bent down; petals linear, reflexed; lip cuneate-dilated, emarginate, two-lobed, with dark ochre anterior margins, reddish-brown on the disk; peduncle nearly 9in. long. *l.* solitary, cuneate-oblong-ligulate, acute, protected by a sheath. Java, &c., 1885.

L. longipes (long-footed). *fl.* pale green, minute, borne in racemes. *l.* 3in. to 6in. long. Bulbs 1½in. long. Tropical Asia, &c. 1883. An unattractive species. SYNS. *L. minutiflora, L. spathulata.*

L. l. pendula (pendulous). The correct name of *L. pendula.*

L. minutiflora (minute-flowered). A synonym of *L. longipes.*

L. spathulata (spoon-shaped). A synonym of *L. longipes.*

L. tricallosa (having three calli). *fl.*, sepals greenish-yellow; petals yellow or purple, filiform; lip rather large, yellowish-green changing to dull purple, with dark veins and two (*sic*) blackish-purple calli at base. *l.* soft, cuneate-oblong. Pseudo-bulbs elongated, tetragonal. Borneo, 1879.

The following species have also been introduced: *L. Bowkeri, L. cuneilabris, L. disticha, L. elliptica, L. montana* (SYN. *Gastroglottis montana*), *L. multiflora, L. nervosa, L. Prainii, L. Saundersiana, L. Stricklandiana.*

LIPOCHÆTA (in part). A synonym of **Zexmenia** (which see).

LIPPIA. To the species described on p. 284, Vol. II., the following should be added:

L. bracteata (bracteate).* *fl.* dull red, subtended by violaceous bracts, disposed in sub-globose heads. *l.* large, opposite, ovate, acuminate, scabrous above, tomentose beneath. 1883. An ornamental, free-flowering, greenhouse shrub.

L. canescens (hoary).* *fl.* in ovoid or at length sub-cylindrical heads; corolla clear lilac, with a yellow throat; peduncles axillary, solitary, filiform. Summer. *l.* small, spathulate-obovate, -oblong, or -lanceolate, acute. Stems suffruticose, rooting, sometimes filiform. South America, 1664. SYNS. *L. filiformis, L. repens* (of gardens). This plant is grown in Southern California as a substitute for lawn grass. It grows freely in any soil, and quickly covers the ground.

L. filiformis (thread-like). A synonym of *L. canescens.*

L. iodantha (violet-flowered). *fl.* yellow, small, abundant, disposed in bunches at the tips of axillary peduncles, with purple bracts. Autumn. *l.* opposite, lanceolate, serrulated. *h.* 4ft. to 6ft. Mexico. (G. & F. 1896, p. 105.)

L. repens (creeping), of gardens. A synonym of *L. canescens.*

LIQUIDAMBAR. According to the "Index Kewensis," *L. orientalis* is the correct name of *L. imberbis.*

LIQUIRITA. Included under **Glycyrrhiza** (which *see*), the correct name of *L. officinalis* being now *G. glabra.*

LIRIODENDRON. A variegated (*L. t. aureo-marginatum*), a fastigiate (*L. t. fastigiata*, of gardens), a pyramidal (*L. t. pyramidale*), and an obtuse-lobed (*L. t. obtusilobum*) variety of the well-known *L. tulipifera* are now in cultivation.

The varieties of *Liriodendron* may be increased by layering—a rather slow process of propagation, as roots are thrown out but sparingly. They may also be raised by grafting on stocks of the type. As the roots of *Liriodendron* are not furnished with many fibres, it is necessary to transplant frequently in a young state, unless they are planted at once in the positions they are to occupy permanently.

LIRIOPE. *L. spicata* is the correct name of *L. graminifolia.*

LIRIOPE (of Herbert). A synonym of **Elisena** (which *see*).

LIRIOPE (of Salisbury). A synonym of **Reineckea** (which *see*).

LIRIOPSIS. A synonym of **Elisena** (which *see*).

LISIANTHUS. *L. alatus* is the correct name of *L. Œrstedii. L. exaltatus* is a synonym of *Eustoma silenifolium.* A few species formerly included hereunder are now referred to **Leianthus.** *Wallisia princeps* is a synonym of *L. princeps.*

LISSOCHILUS. To the species described on p. 286, Vol. II., the following should be added:

L. arenarius (sand-loving). *fl.* purple, with dusky or olivaceous sepals and some yellow inside the spur; sepals and petals ⅜in. to ¾in. long; lip broadly pandurate, ¾in. to 1¼in. long; racemes 4in. to 8in. long, six- to ten-flowered; scapes 2ft. to 3½ft. high. *l.* linear or lanceolate-linear, 1ft. to 1½ft. long. Tropical Africa, 1885.

L. dilectus (beloved). *fl.* rosy, with a purple lip, large; sepals linear-lanceolate, accuminate, reflexed; petals oblong, very broad; lip three-lobed, the side lobes broad, the front one nearly square, retuse; peduncle 2ft. to 3ft. high. *l.* broad. Rhizomes branched, hand-like. Congo, 1886.

L. dispersa (scattered). A synonym of *L. Wakefieldii.*

L. giganteus (gigantic).* *fl.* 2½in. to 3in. across; sepals greenish, tinged with rose, turned sharply back; petals light rose-purple, large, obtuse; lip light rose-purple, with some darker streaks and three yellow keels; scapes erect, 6ft. to 8ft. or more in height, racemose above the middle. May. *l.* narrow-lanceolate, acute, 3ft. to 5ft. long. Tropical Africa, 1887. A noble species. (G. C. 1888, iii., pp. 616-17; I. H. 1888, t. 53; W. O. A. x., t. 457.) SYN. *Eulophia gigantea.*

L. Græfei (Dr. Græfe's). A synonym of *L. Krebsii.* (R. G. 1899, t. 1460.)

L. graniticus (granite-like).* *fl.* golden-yellow and violet; sepals ¼in. long; petals broadly ovate, ¼in. long; lip pandurate-oblong, ¼in. long; racemes 1ft. long, laxly many-flowered; scapes 4ft. high. *l.* five, elongated-linear, 9in. to 15in. long. Tropical Africa, 1894. A handsome species.

L. Krebsii purpurata (purple). *fl.* 2in. in diameter; sepals dark green outside, maroon-purple inside, the margins revolute; petals bright yellow above, beneath pale cream-coloured faintly veined with red; lip dull orange-yellow, with chocolate-purple side lobes, streaked with darker lines; scape about 3½ft. high. *l.* thin, broadly lanceolate, acute, plicate, 1ft. long. South Africa, 1885. (W. O. A., vi. t. 259.) There is another variety, *pallida.*

L. milanjianus (Mlanje). *fl.*, sepals purplish-brown, green at base, ¼in. long; petals rosy-carmine, with darker veins; lip yellow, with some dark nerves on the side lobes, deeply trilobed; racemes 6in. to 9in. long, laxly many-flowered; scapes 2ft. to 2½ft. high. *l.* linear-oblong, 6in. long. Mlanje, &c., Mozambique, 1889. (B. M. 7546.) SYN. *Eulophia bella.*

L. parviflorus (small-flowered). *fl.* pale red, six to eight to a scape; upper sepal concave, clawed, reflexed, the lateral ones spreading; petals slightly clawed; lip almost free, auricled at base. December. South Africa, 1822. (B. 172.)

L. roseus (rosy).* *fl.*, sepals deep velvety-brown, spathulate, concave, reflexed; petals deep rose, large, oblong, apiculate, recurved; lip deep rose, three-lobed, rounded, longer than the petals, with a golden crest on the disk, the under-side and the spur yellow; raceme dense, oblong; scape 3ft. to 4ft. high. *l.* stiff, erect, broadly lanceolate, plicately veined. Sierra Leone, 1841. A grand species. (B. R. 1844, 12.)

L. Sandersoni (Sanderson's).* *fl.* 2in. to 2½in. in diameter; sepals dirty green, edged and nerved brown; petals pure white, much larger, obliquely and falcately broad-oblong; lip large, the side lobes dark green, with brownish veins, the mid-lobe having a pale violet, purple-streaked limb, and a yellowish-green disk; spike 1ft. long, erect; scape 6ft. to 7ft. high. June. *l.* 3ft. to 4ft. long, 3in. to 4in. broad, elongate-lanceolate, acute, narrowed into long petioles. Natal, 1879. A stately plant. (B. M. 6858.)

L. stylites (columnar).* *fl.* rose-coloured, as large as a good *Zygopetalum intermedium*; sepals triangular, acuminate, reflexed; petals oblong, wide; lip nearly square, blunt-edged, dark-spotted at the base inside, having a short, conical, angled spur, and two styliform processes in the mouth. February. *l.* linear-lanceolate, 2ft. long. Tropical Africa, 1885. A handsome species.

L. Wakefieldii (Wakefield's). *fl.*, sepals green, ¼in. long; petals bright yellow, ⅜in. long; lip pandurate-oblong, with three to seven bright yellow keels; racemes 6in. to 7in. long; scapes 2½ft. to 4ft. long. *l.* elongated-linear, 6in. to 9in. or more in length. Tropical Africa, 1893. SYNS. *L. dispersus, Eulophia dispersa.*

L. cristatus and *L. purpuratus* are also grown at Kew, but are not in general cultivation.

LIST. A name for the woollen shreds employed in securing trees to a wall.

LISTERA (named in honour of Martin Lister, an early and celebrated British botanist). SYN. *Diphryllum*. ORD. *Orchideæ*. A genus embracing about ten species of hardy terrestrial Orchids, found in Europe, Northern Asia, and America, and readily known from the small-flowered, spurless British Orchids by the two leaves borne at some distance from the ground, placed so near together as to appear opposite. Flowers green, small, in a slender raceme. *L. cordata* and *L. ovata* are British plants. The species have little or no horticultural value.

LISTROSTACHYS. Included under **Angræcum** (which *see*).

LITA. A synonym of **Voyria** (which *see*).

LITCHI, or **LEECHEE.** These are the fleshy seeds of *Nephelium Litchi*. They have recently found their way into English markets, their sweet flavour and delicious scent being much appreciated.

LITHAGROSTIS. A synonym of **Coix** (which *see*).

LITHOSPERMUM. Including *Batschia* (of J. F. Gmelin) and *Pentalophus*. *L. arvense*, *L. officinale*, and *L. purpureo-cæruleum* are British plants. To the species described on p. 286, Vol. II., the following should be added. *See also* **Alkanna.**

L. angustifolium (narrow-leaved). *fl.*, earlier ones bright yellow, large and showy, the later ones smaller and pale, pedicellate. June. *l.* all linear. Root thick and deep, abounding in violet dye. *h.* 9in. to 12in. or more. North America, 1812. An erect or diffusely branched perennial. SYNS. *Batschia longiflora*, *Pentalophus longiflorus*. *L. a. longiflorum* has pale yellow flowers.

L. Gastoni (Gaston's).* *fl.* very deep blue, with a white eye. June and July. *h.* 1ft. Pyrenees.

L. graminifolium (Grass-leaved). *fl.* deep blue, drooping, disposed in terminal clusters; scape 6in. to 12in. long, wiry. June to August. *l.* tufted, Grass-like. Northern Italy, &c. SYN. *Moltkia graminifolia*.

L. graminifolium (Grass-leaved), of Rœmer and Schultz. A synonym of *L. rosmarinifolium*.

L. rosmarinifolium (Rosemary-leaved). *fl.* bright blue, lined white, about ⅜in. in diameter, terminal. June to September. *l.* narrow, 1in. or more long. *h.* 1ft. to 2ft. Central Italy, &c. Evergreen. SYN. *L. graminifolium* (of Rœmer and Schultz).

L. tinctorium (dyer's). The correct name of this plant is *Alkanna tinctoria*.

LITOBROCHIA. Included under **Pteris** (which *see*), the correct name of *L. Vespertilionis* being *P. incisa*.

LITSEA includes *Tomex*.

LITTLE MILLET. *See* **Panicum miliaceum.**

LITTONIA. To the species described on p. 287, Vol. II., the following variety should be added:

L. modesta Keitii (Keit's). A very vigorous form, much more floriferous than the type. 1886. (R. G. 1237.)

LIVER OF SULPHUR. A well-known fungicide, sometimes called Potassium Sulphide.

LIVID. Lead-coloured, bluish-brown, or grey.

LIVISTONA. There are few more decorative genera of Palms than *Livistona*, many species of which are grown for market, *L. chinensis* in particular; while in a young state some of them are amongst the most ornamental species known, *L. rotundifolia* (Fig. 527) for example. All the species are, however, not equally robust. *L. chinensis*, already alluded to, and *L. australis* are two species that may be readily grown in a cool house; but the species illustrated requires warmer treatment. To the species described on pp. 287-8, Vol. II., the following should be added:

L. enervis (nerveless).* *l.* deeply divided, flabelliform; segments only ¼in. broad and very delicate in texture. 1891. Perhaps the same as *L. inermis* (SYN. *Corypha decora*, of gardens), which is a form of *L. humilis*.

L. Leichardtii (Leichardt's). A synonym of *L. humilis*.

L. Ramsayi (Ramsay's). A synonym of *Licuala Muelleri*.

L. Woodfordii (Woodford's).* *fl.*, spadix nearly 4ft. long, paniculate. *fr.* globular, ¾in. long, probably bright red. *l.* long-petiolate, sub-orbicular, 1½ft. long and nearly as broad; lobes narrow, acuminate. *h.* 30ft. to 40ft. Polynesia. A beautiful Palm.

L. Drudei, *L. subglobosa*, and *L. Woganii* are also grown in the Kew Collection.

LLAVEA. Mexican Flowering Fern. Although an old inhabitant of our gardens, *L. cordifolia* is unfortunately seldom found in collections. The fact of its being generally grown in too warm a place, explains the speedy death of specimens which, under cooler treatment, would have lasted for years and increased in size and strength. The plant is of a thoroughly evergreen habit, and in an intermediate or temperate house forms a splendid subject, either grown as a pot plant or, better still, planted on rockwork or in any place where drainage is perfect, on the summit of a projecting "rock" for instance, in a mixture of peat and sand in about equal parts. A little crock-dust may with advantage be added to the compost, as this helps to keep the soil open, which seems the condition most essential to the welfare of the plant. It should be placed in a well-ventilated position, and syringing overhead should be carefully avoided. It is usually propagated by division of the crowns.

LLOYDIA. *L. alpina* is now the correct name of *L. serotina* (SYN. *L. striata*).

FIG. 527. LIVISTONA ROTUNDIFOLIA.

LOAM. A very broad and comprehensive term applied to soils of various characters. As usually understood by gardeners, Loam is the top spit from a pasture field. It is full of fibre, and is suitable for potting purposes and for making new Vine and other fruit-tree borders. It varies very considerably, and is known under different names. Black Loam is usually found in low-lying districts; sandy Loam is pretty well distributed over the whole country, and though producing early crops, is of a hungry nature, requiring liberal manuring. The same applies to chalky Loam; but heavy Loams resting on clay or rock are more retentive, and though less easy to work, require less manure to keep them fertile, and when properly cultivated produce the heaviest crops of grain, fruit, or vegetables, and for plants like Roses such soil is the most desirable.

LOASA. To the information given on pp. 288-9, Vol. II., the following should be added:

L. lateritia. The correct name is *Blumenbachia lateritia*.

L. palmata (palmate). A synonym of *Blumenbachia insignis*.

L. Pentlandii. The correct name is *Blumenbachia Pentlandii*.

LOAVING. This is an old term, better understood now under the word "Hearting," when the central leaves of a plant form a firm heart, through the leaves not unfolding, as in the Cabbage and Lettuce.

LOBELIA. Including *Parastranthus*. *L. Dortmanna* (Water Lobelia) and *L. urens* (Acrid Lobelia) are included in the British Flora.

Dwarf tender Lobelias are not as frequently utilised for hanging-baskets in summer as they should be. Varieties like Cora Linn, Barnard's Perpetual, Royal Blue, and White Lady are all excellently adapted for this method of culture as well as for beds, borders, and pots. The perennials are amongst the finest of hardy flowers, affording a magnificent display during the later months of the year. They may be accommodated in either beds or borders, and in the latter case they are most effective when associated with some of the evergreen shrubs. The only thing against them is that they are not quite hardy, and their crowns need to be covered with litter during very hard weather.

To the species described on pp. 290-1, Vol. II., the following should be added. A few species formerly included hereunder are now referred to **Pratia.**

L. cardinalis. There is a lovely variety of this known as Crimson Beauty. It has deep red flowers and very effective dark red foliage. *h.* 2½ft. Half-hardy perennial.

L. c. atrosanguinea (dark red). A dark red form of the beautiful type.

L. debilis (weak). The correct name of *L. Speculum.*

L. Dortmannii (Dortmann's). A name applied in Continental gardens to what is apparently a form of *L. Erinus.*

L. fulgens. Two or three fine garden varieties have been introduced which are far superior to the type. These are ALBA, white; FIREFLY, bright crimson; HEAVENLY BLUE, clear light blue; QUEEN VICTORIA, deep vermilion; ROSEA, clear rose; SNOWFLAKE, pure white; VIOLACEA, reddish-violet, with red foliage. All are about 3ft. high.

L. Gerardi (Gerard's).* *fl.* rich violet, very large, clustered; calyx ciliated on the margins. *l.* forming a rosette. Stems 4ft. to 5ft. high, very strong. A fine hybrid between varieties of *L. cardinalis* and *L. syphilitica.* (R. H. 1893, p. 519.) There are several forms varying considerably as to colour, from pink to violet-purple.

L. intertexta (woven). *fl.* in the upper axils and loosely racemose at the ends of the branches; lower lip of the corolla white below the middle, violet beyond, ¼in. broad, three-lobed; upper lip violet, small, of two segments. December. *l.* alternate, rather distant, ¼in. to ½in. long. *h.* 6in. British Central Africa, 1898. Half-hardy annual. (B. M. 7615.)

L. Kerneri (Kerner's).* *fl.* violet-purple, covering the upper part of the stem. *l.* broad, lanceolate, toothed, forming a rosette; cauline ones similar. Costa Rica, 1889. Greenhouse perennial. This is considered by some as a variety of *L. splendens.*

L. littoralis (seashore-loving). The plant frequently catalogued by this name is **Pratia angulata** (which *see*).

L. Milleri (Miller's).* *fl.* rich purple. *h.* 3ft. An excellent hybrid between *L. fulgens* and *L. syphilitica.*

L. physaloides (Physalis-like). A synonym of *Colensoa physaloides.*

L. purpurascens (purplish). The correct name of *L. ilicifolia.*

L. Rivoirei (Rivoire's). *fl.* of a clear rose-colour. 1897. A perennial, which does best in the open ground; the seeds germinate with difficulty, and should not be covered with earth.

L. sessilifolia (sessile-leaved). *fl.* violet; corolla four times as long as the calyx. June. *l.* sessile, approximate, lanceolate, serrulated; lower ones obtuse; upper ones acute. Stems erect, simple, 1ft. or more in height. Kamtschatka, 1832. Hardy perennial.

L. splendens is a variety of *L. fulgens.*

L. sub-nuda (nearly naked).* *fl.* pale blue, about ¼in. across, borne on rather long pedicels, and arranged in lax, naked racemes. *l.* all radical, in a reduced rosette (the stem having only a few very reduced ones), stalked, cordate-ovate in outline, the margins pinnatifidly cut, dark green above, beneath purplish, with green veins. Mexico, 1837. A small-flowered but pretty hardy annual, suitable for rockwork. (G. C. ser. iii., vol. ii., p. 204.)

L. tenuior grandiflora (large-flowered). A large-flowered form of the well-known type.

L. umbellata (umbelled). *fl.* blue, terminal, umbellate; corolla 1in. long. June. *l.* sessile, linear, dilated and trifid at apex, long-toothed. Stems angular, erect, 1ft. high. Habitat unknown, 1878. Greenhouse perennial.

Lobelia—*continued.*

Varieties. In the Bedding section of Lobelias several distinctly-improved varieties have been introduced, the best of which will be found enumerated below:

BARNARD'S PERPETUAL, dark blue, white eye, large and profuse as to flower, and of graceful habit; BRIGHTON BLUE, deep blue, very compact; CARMINE GEM, a beautiful carmine; COBALT BLUE, azure-blue; COLIBRI, light pink, with large white eye and rose spot on the petal; COMPACTA ALBA, pure white; CORA LINN, dark blue, of trailing habit; CRYSTAL PALACE, deep ultramarine blue, one of the best for borders; EMPEROR WILLIAM, dark blue, one of the best; MAID OF MORAY, blue, with large white eye, dwarf; OXONIAN, rich deep blue, with white eye, very compact; PARROT, dark blue, with white eye and carmine spot; PRIMA DONNA, maroon-crimson; PUMILA COMPACTA, bright blue; PUMILA INGRAMI, white; REINE BLANCHE, pure white; ROYAL BLUE, deep blue, with white eye, bushy habit; STIRLING BLUE, light blue, vigorous; TRICOLOR, blue or pink, with white eye and carmine spots; WHITE LADY, white, large, and free.

LOBELIA (of Presl). A synonym of **Siphocampylos** (which *see*).

LOBESIA RELIQUANA. *See* **Vine Moths.**

LOBLOLLY BAY. *See* **Gordonia Lasianthus.**

LOBULE. A small lobe.

LOCHNERA. A synonym of **Vinca** (which *see*).

LOCKHARTIA. SYN. *Fernandezia* (of Lindley). To the species described on p. 292, Vol. II., the following should be added:

L. amœna (pleasing).* *fl.* of a beautiful yellow, fascicled, having the lip painted with purple and the column with brown; sepals ovate, acute; petals complicate, recurved; lip tripartite; bracts ample. March. *l.* triangular, obtuse. Stem rather tall. Costa Rica, 1872. A pretty species.

L. lunifera (moon-bearing). The correct name of *Fernandezia robusta.*

LOCULICIDAL. Dehiscing, or splitting through the back of the loculus or cell of a seed-vessel; *i.e.*, by the dorsal suture of the carpel.

LOCUST, AFRICAN. *See* **Parkia africana.**

LOCUST, HONEY. *See* **Gleditschia triacanthos.**

LOCUST-TREE, SWAMP or WATER. *See* **Gleditschia monosperma.**

LODEWORT. *See* **Ranunculus aquatilis.**

LOGANBERRY. This is a supposed cross between the Blackberry and the Raspberry. The growths are somewhat like those of the Raspberry, but more prickly. The fruit is large and Raspberry-like in shape, with larger pips and darker colour; the flesh is firm, very juicy, and briskly acid. When well established, the plant produces good crops of fruit. Propagation is best effected by division, which may be done by potting the pieces as soon as divided in the autumn and planting them out early in March. Or the divisions may be made in spring as the plants commence to grow, putting them out permanently at once.

LOMANDRA. A synonym of **Xerotes** (which *see*).

LOMARIA. Including *Plagiogyria* and *Stenochlæna.* Of the members of this extensive genus, the great bulk are greenhouse plants. It is especially the numerous and handsome species native of Brazil, Chili, New Zealand, Australia, and Africa, which may be employed for the ornamentation of our cool-houses, as not only is this mode of treatment the most rational and the least expensive, but it is also the only one under which such species thrive well. It is an indisputable fact that, whereas fine-foliaged or flowering plants may often, when submitted to the influences of great heat and moisture, be induced to grow more rapidly, in the case of Lomarias a temperature kept above their requirements is productive of disastrous results. This is undoubtedly owing to their natural dislike of having water over their foliage, and plants under such conditions must be copiously syringed to counterbalance the effects of the heat employed in the process of "forcing." Now, to Lomarias

Lomaria—*continued.*

this mode of culture cannot possibly be applied with any chance of success. First, because, as soon as the temperature becomes too high, Thrips make their appearance; and, secondly, if water overhead is used at all, the texture of the foliage of most species is such that the fronds get spotted, and the whole plants in a very short time present a wretched appearance. As these remarks are applicable to nearly all the species, large and small alike, and as they are of the utmost importance

FIG. 528. BARREN AND FERTILE FRONDS OF LOMARIA BLECHNOIDES.

for the successful management of this particular genus, they cannot possibly be too carefully observed.

Besides some Japanese and Chilian species which are thoroughly hardy in many parts of England, there is *L. Spicant*, the only member of the genus having a claim to European origin. This is found in nearly all parts of Europe—in Denmark, Norway, Sweden, &c. In this country it grows abundantly under hedges and in lanes, as well as in Ireland, especially in the counties of Clare and Wicklow; but the coldest habitat to which it is indigenous with us is the Cairngorm Mountain, in Aberdeenshire, where it is found at an elevation of 1200ft.

With very few exceptions, one kind of soil is suitable for all Lomarias. It should consist of about equal parts good fibrous loam, leaf-mould, and silver-sand. Where leaf-mould is not easily procurable, an equal proportion of peat may be substituted, but leaf-mould is better. A few of the smallest-growing kinds, such as *L. alpina*, *L. blechnoides* (see Fig. 528), *L. Germainii*, and *L. lanceolata*, are adapted for growing in Fern-cases, where, on account of their distinctly-shaped fronds, they contrast in a pleasing manner with the more feathery as well as with the more massive kinds with which they are associated. Several species are also useful for room-decoration, and *L. gibba* is very extensively raised for that purpose. The slower-growing, but very compact, *L. ciliata* and *L. discolor nuda* are also highly decorative. *L. ciliata* and *L. c. gigantea* require to be kept in the drier part of the house, for if the slightest moisture be allowed to settle upon the fronds black streaks will appear, and the plants ultimately will decay.

L. L'Herminieri is a most attractive Fern, as its foliage when young is of a beautiful crimson colour, changing

Lomaria—*continued.*

with age to a dark glossy green. It is, unfortunately, not very common in collections, although now and then fine specimens may be seen in which several shoots have started at different intervals from the side of the main trunk, and developed so as to form a four- or six-branched plant, which is then very decorative. Besides being one of the Lomarias most sensitive to moisture on the fronds, it is also one requiring peat and sand only to thrive well, as loam, unless very light and fibrous, is injurious to its roots.

Although Lomarias will not bear being kept dry, yet they do not require so much water at the roots as do

FIG. 529. FERTILE AND BARREN FRONDS OF LOMARIA FLUVIATILIS.

the majority of other Ferns. They should be potted somewhat loosely, for they dislike the soil being rammed hard. An excellent way of making use of them is to plant them in dead Tree-Fern stems. Remove the decayed or partly-decayed matter from the centre of the stems, and scoop them out sufficiently to accommodate a solitary plant with a little mould round it, in order to give it a start; after that, keep the stem constantly moist, and the result will be that in a short time the roots of the transplanted Lomaria will have taken

Lomaria—*continued.*

possession of the dead stem, in which they run apace. The plant will have the appearance of a handsome Lomaria with a stout stem of its own, and, if properly managed, will remain for years in excellent condition. A few species are naturally of arborescent habit, but this is rather the exception than the rule. Lomarias are almost invariably increased by means of their spores, which are abundantly produced and germinate very freely.

In many sheltered places *L. alpina* may be treated as a hardy Fern; but this species succeeds best and remains evergreen in the greenhouse. It is extremely useful for edging in the rockery or for planting in groups, making patches of a metallic or dark green colour on, say, the point of a rock, as it is a plant which requires very little soil in which to grow.

In the case of *L. discolor bipinnatifida*, it is advisable to subject it to as little artificial heat as possible, so as to keep it free from the attacks of Thrips and Red Spider, which are particularly fond of it.

The barren fronds of *L. fluviatilis* (see Fig. 529), being of a drooping character, render the plant suitable for growing in small hanging-baskets. Cultivated in that way, it shows itself to perfection. The method is also more beneficial to the plant, for if the fronds are allowed to lie on the ground they get damaged by constant contact with moisture, and soon deteriorate.

L. punctulata is an easily-grown plant which requires thorough drainage, stagnation at the roots being particularly injurious to it. Its fronds are very valuable for decoration, as they retain their freshness for a long time when cut and kept in water.

The Hard Fern (*L. Spicant*) is one of the commonest of our evergreen species, and its striking dwarf and sturdy habit, as well as the deep green colour of its barren fronds, renders it one of the most useful plants for the decoration of the outdoor rockery, where, in a moist, shady nook it forms a beautiful and most

Lomaria—*continued.*

conspicuous object. *L. Spicant* is one of the least fastidious of all our British Ferns, for, although it prefers a moist situation with a northern aspect, it also succeeds in a stiff, clayey soil, and when exposed to the direct rays of the sun. It dislikes lime in any form. The compost in which the Hard Fern and its varieties grow most luxuriantly is one made of loam, peat, leaf-mould, and sand in equal parts. In planting, it is found most beneficial to intermix, if possible, some fragments of broken sandstone with the compost, which is thus rendered more permeable, although retaining at the same time its permanently moist nature. It is in great request for the hardy Fernery, but, like some others of our British Ferns, it may with great advantage be also used for the decoration of the greenhouse and conservatory. Under such conditions its fronds, which are extremely useful in a cut state for mixing with cut flowers, retain their stiffness all through the winter. Some very handsome specimens of this species, in 5in. pots, have lately been produced in quantities by our market-growers for winter decoration. The most reliable method employed for increasing the varieties of the Hard Fern is by division of the crowns. Very little dependence can be placed on their exactly reproducing the varieties in any other way. The species is readily propagated by means of spores, which are usually ripe about September.

To the species and varieties described on p. 295, Vol. II., the following should be added:

L. alpina ramosa (branched). This is a dwarf, crested form of the type.

L. aspera (rough). *cau.* stout, ultimately elongated, brown-scaly. *sti.* scarcely any. *barren fronds* 6in. long, 2in. broad, ovate-lanceolate, gradually narrowed below; pinnæ close, the largest ⅜in. long, ⅜in. broad, slightly dilated at base and auricled above. *fertile fronds* 3in. long, ⅜in. broad, borne on longer stipes; pinnæ crowded, ⅛in. long, ⅛in. broad. Chili and Chiloe.

L. Boryana Dalgairnsiæ. The fertile fronds of this variety, which are of a very erect, rigid habit, have their pinnæ conspicuously contracted.

L. ciliata gigantea (gigantic).* *sti.* densely clothed with dark scales. *fronds* often 1¼ft. to 1½ft. in length. A handsome form.

L. c. grandis (large).* *fronds* having pinnæ as wide as in *Blechnum brasiliense*. A handsome form, stronger and more regular in growth than the type. 1897.

L. c. major (larger). A strong-growing and handsome form, with a spreading habit. 1897.

L. Dalgairnsiæ (Miss Dalgairns'). A form of *L. Boryana*.

L. discolor bipinnatifida (bipinnatifid).* *barren fronds* often 3ft. long, 6in. broad, numerous; pinnæ overlapping, cut to the midrib. *fertile fronds* (so called) usually as sterile as the barren ones. South Australia. This handsome variety can only be increased by suckers.

L. d. nuda pulcherrima (very pretty).* This garden variety differs from *L. d. nuda* in having the tip of each pinna somewhat crested or forked, and the apex of the frond still more distinctly crested.

L. falcata (falcate). The plant found in catalogues and in collections under this name is *L. discolor nuda*.

L. gibba platyptera (broadly-winged).* A gigantic variety, often producing fronds 3ft. in length. It has all the appearance of a Blechnum, and does not produce spores. See Fig. 530.

L. g. rosea (pink). A synonym of *L. g. tincta*.

L. g. tincta (tinged).* *fronds* when young tinged with pink, the central ones being almost

FIG. 530. LOMARIA GIBBA PLATYPTERA.

Lomaria—*continued.*

perpendicular; pinnæ narrower and more pointed than in any other form of *L. gibba*. SYN. *L. g. rosea.*

L. heterophylla (variable-leaved). A form of *L. attenuata.*

L. membranacea (membranous). *rhiz.* short, clothed with dark brown scales. *barren fronds* narrow-oblong, 6in. to 9in. long, 1in. to 1¼in. broad, shortly stalked; pinnæ coriaceous, narrow-oblong, blunt, notched, quite distinct at base though connected, the lowest reduced to auricles. *fertile fronds* borne on stalks several inches long; pinnæ narrow and distantly placed. New Zealand. Greenhouse.

L. minor (lesser). A synonym of *L. procera.*

L. neocaledonica (New Caledonian). A synonym of *L. gibba.*

L. onocleoides.* Barren and fertile fronds of this beautiful, evergreen species are shown in Fig. 531.

L. procera. SYN. *L. minor.* Many Ferns which were formerly regarded as distinct species, but which are only varieties of *L. procera* (see Fig. 532), are found in catalogues under specific names. Several of these are mentioned on p. 294, Vol. II.

L. p. Duttoni (John Dutton's). *barren fronds* more leafy than in the type. The mock fertile ones have long, narrow, whip-like pinnæ. New Zealand. This form is quite barren, and can only be propagated by means of the stolons, which are sparingly produced.

FIG. 531. BARREN AND FERTILE FRONDS OF LOMARIA ONOCLEOIDES.

L. Spicant. Hard Fern. The following additional distinct varieties may be mentioned:

L. S. Aitkiniana (Aitkin's). *fronds*, lower portions contracted, the surface slightly corrugated, the apex magnified into a huge, branching head, of which the under-side bears traces of an excurrent line like the marginate Scolopendriums. County Clare, Ireland, 1882. See Fig. 533.

L. S. contracta. A barren frond of this distinct and constant variety is shown at Fig. 534.

Lomaria—*continued.*

FIG. 532. BARREN FROND OF LOMARIA PROCERA.

FIG. 533. CREST OF LOMARIA SPICANT AITKINIANA.

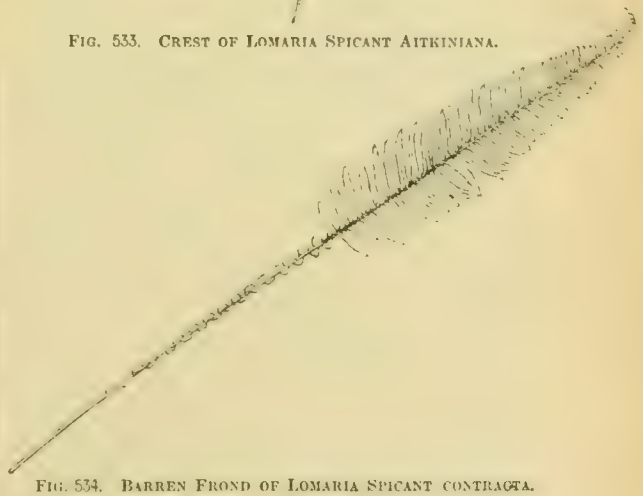

FIG. 534. BARREN FROND OF LOMARIA SPICANT CONTRACTA.

FIG. 535. BARREN FROND OF LOMARIA SPICANT POLYDACTYLA.

Lomaria—*continued.*

FIG. 536. BARREN FROND OF LOMARIA SPICANT RAMO-CRISTATA.

L. S. obovatum (obovate). *fronds* normal in outline, but the pinnæ very much contracted at the base, so that they take a distinctly obovate form. St. Michael's, Azores, 1882.

L. S. polydactyla.* Of this charming Cornish variety a barren frond is shown in Fig. 535.

L. S. ramo-cristata (branched and crested).* *barren fronds* about 5in. long, twice or several times branched, the summit of each branch divided and crested; pinnæ broad, almost square at apex. Yorkshire. See Fig. 536.

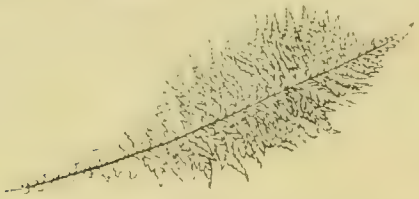

FIG. 537. BARREN FROND OF LOMARIA SPICANT SERRATA.

L. S. serrata (serrated). *barren fronds* 1ft. long, 3in. broad; pinnæ somewhat falcate, deeply but finely toothed, the tips often forked (see Fig. 537). *fertile fronds* longer and more upright; pinnæ very narrow, sharply toothed, occasionally forked at apex. Tunbridge Wells, &c.

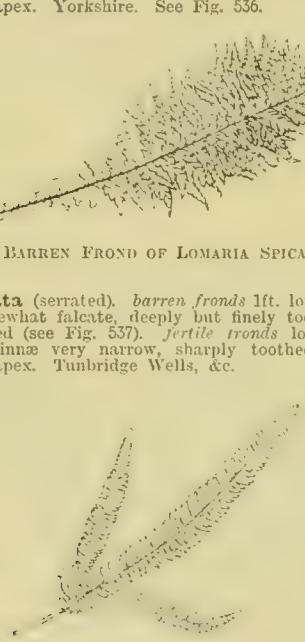

FIG. 538. BARREN FROND OF LOMARIA SPICANT TRINERVIS.

L. S. trinervis (three-nerved). A barren frond of this handsome variety is shown at Fig. 538.

L. zamiæfolia (Zamia-leaved). A synonym of *L. Boryana cycadoides.*

LOMATOGONIUM. A synonym of **Pleurogyne** (which *see*).

LOMATOPHYLLUM. The three or four species of this genus are natives of the Mascarene Islands. *L. borbonicum* is the correct name of *L. aloifiorum.*

LOMBARDY POPLAR. *See* **Populus nigra pyramidalis.**

LONCHITIS. These plants thrive in a mixture of two parts peat and one part fibrous loam; they require an abundance of water at the roots and complete protection from the direct rays of the sun. Lonchitises may possibly be objected to for pot culture on account of their strong growth; but in the conservatory or in the rock Fernery,

Lonchitis—*continued.*

where bold-looking subjects are frequently required for effect, they never fail to prove a source of attraction, especially when planted out with sufficient space allowed them in which to develop their handsome fronds. When fertile, the fronds are very conspicuous on account of the bright colour of the spore-masses. Though usually

FIG. 539. PINNA OF LONCHITIS PUBESCENS.

propagated by division of their underground rhizomes, these plants may also be increased by means of their spores, which germinate freely if sown as soon as they are ripe. Of the species cultivated, *L. pubescens* (see Fig. 539) is the more popular.

LONCHOCARPUS. To the species described on p. 296, Vol. II., the following should be added:

L. Barteri (Barter's).* *fl.* in clusters of eight to ten, ⅜in. long, shortly pedicellate; calyx reddish-brown, hemispheric; corolla rose-pink, the standard shortly clawed, the wings obtuse; racemes 1ft. to 1½ft. long. September. *l.* 1ft. long or more; leaflets five or seven, 4in. to 7in. long, petiolulate, elliptic-oblong, acuminate or caudate-acuminate. Tropical Africa. A handsome stove climber. (B. M. 6943.)

L. latifolius (broad-leaved). *fl.* pale purple; corolla ¼in. long. *l.*, leaflets two to four pairs, elliptic or lanceolate-oblong, acute, 2in. to 6in. long, 1in. to 2in. broad, minutely puberulous beneath. West Indies, 1868. Stove shrub or tree.

LONDON PURPLE. An arsenical preparation largely employed in combination with lime as an insecticide. Used alone it is effective so far as the pests are concerned, but hurtful to the trees, especially to the tenderer kinds like Peach. Used in the proportion of 1lb. of London Purple to 1lb. of lime and 250 gallons of water it will not scorch the foliage. Used in combination with Bordeaux Mixture it is very effective against fungi as well. Before using London Purple the mixture should be well stirred. It is a most virulent poison, and must therefore be employed with care.

LONICERA. The British Flora embraces *L. Caprifolium* (Woodbine), *L. Periclymenum*, and *L. Xylosteum.* To the species and varieties described on pp. 296-7, Vol. II., the following should be added:

L. Alberti (Albert Regel's). *fl.* rose-coloured; corolla nearly regular. *l.* soft, linear, somewhat resembling those of Rosemary, greyish-green, glaucous beneath. Branches slender, dependent. Turkestan, 1887. Plant dwarf. (B. M. 7394; R. G. 1065.) SYN. *Chamæcerasus Alberti* (of gardens).

L. alpigena (alpine). *fl.* greenish-fuscous-red; corolla gibbous at base. April. *l.* oval-lanceolate, acute, glabrous or pubescent, very shortly petiolate, scarcely toothed. Stem erect. *h.* 6ft. Central and Southern Europe, 1596. (J. F. A. 274.)

L. a. nana (dwarf). This only differs from the type in its dwarfer, more compact habit. SYN. *Chamæcerasus alpigena nana* (of gardens).

L. a. Webbiana (Webb's). *fl.* yellowish-green, suffused outside with brownish-red; corolla bilabiate. *l.* large, oblong or elliptic-oblong, abruptly pointed. Himalayas, 1838. (R. G. 1838, pp. 7-8, f. 2, under name of *L. Webbiana.*)

L. aureo-reticulata (golden-reticulated).* Japanese Golden Honeysuckle. A form of *L. japonica flexuosa.*

Lonicera—*continued.*

L. bella (pretty).* A garden hybrid between *L. chrysantha* (*Morrowi*) and *L. tatarica*. The following forms are grown in Continental gardens: *albida* (whitish), *atrorosea* (dark rose), *candida* (white), *incarnata* (flesh-coloured), and *rosea* (rose).

L. brachypoda is a form of *L. japonica flexuosa*.

L. chrysantha (yellow).* *fl.* at first yellowish-white but ultimately changing to bright yellow. *fr.* bright coral-red. *l.* acuminate, light green. North-east Asia. A handsome and robust-growing species.

L. ciliosa (ciliated). *fl.* bright yellow; corolla tube hirsute; whorls of the sub-sessile spike approximate-capitate. Summer *l.* ovate, glaucous beneath, conspicuously ciliated, or sessile and somewhat amplexicaul. North America.

L. c. occidentalis (Western). *fl.* deep orange-red, in whorled heads. June to August. *l.* ovate, nearly sessile, ciliated, glaucous beneath; upper ones connate. *h.* 15ft. North America, 1830. SYN. *Caprifolium occidentale* (B. R. 1457).

L. confusa (confused). *fl.* white at first, eventually red or yellow; inflorescence almost thyrse-like; peduncles axillary, two-flowered, opposite, velvety. June. *l.* ovate, acute, rounded at base, velvety on both surfaces. Branches twining, pubescent. Japan, China, &c., 1806. Evergreen. SYNS. *L. Halleana*, *L. japonica* (A. B. R. 583; B. R. 70).

L. dioica is a synonym of *L. glauca*.

L. flavescens (yellowish). *fl.* varying in colour from sulphur- to citron-yellow, glandular-hairy; corolla segments nearly regular; bracts ovate, acute; bracteoles covering the base of the corolla. *l.* petiolate, lanceolate, acuminate. British Columbia, 1833. (R. G. 1883, p. 7, f. 1.) SYN. *L. Webbiana* (of gardens).

L. flexuosa is a form of *L. japonica*.

L. floribunda (abundant-flowered). A form of *L. Korolkowii*.

L. Fraseri (Fraser's). A synonym of *L. flava*.

L. gigantea (gigantic). *fl.* golden-yellow, tubular, arranged in a large, terminal panicle. *l.* glaucous, nearly blue, amplexicaul; floral ones connate. 1833. A floriferous garden plant.

L. grata (agreeable). *fl.* very fragrant, whorled in the axils of the upper leaves or leaf-like bracts; corolla red or purplish outside, smooth, 1½in. long, the limb at first nearly white. July. *l.* about 2in. long, obovate, glabrous, glaucous beneath. *h.* 2)ft. North America, 1720.

L. Halleana (Halle's). A synonym of *L. confusa*.

L. Hildebrandiana (Hildebrand's).* *fl.* of a beautiful orange-crimson, 5in. to 7in. long or more, in axillary pairs on short peduncles. *l.* large, dark glossy green, oval or elliptic, shortly acuminate, rounded at base, very glabrous, 4in. to 5in. long. Upper Birma, 1893. The largest of all the Honeysuckles. (G. C. 1898, ii., p. 210, f. 58.)

L. hirsuta-Sullivantii (hybrid). A garden hybrid between *L. hirsuta* and *L. Sullivantii*. 1896. (G. & F. 1896, p. 345, f. 46.)

L. hispida (hispid). *fl.* greenish-white, pendulous; peduncles shorter than the ovate, ciliated bracts, two-flowered. *fr.* purple. *l.* shortly petiolate, ovate-elliptic, 1½in. to 2in. long, rounded or cordate at base, setose-ciliated, glabrous on both surfaces. Stem erect; branches hispid. *h.* 2ft. to 3ft. Central Asia to Siberia, 1883. (R. G. 1100.)

L. japonica (of A. B. R., &c.). A synonym of *L. confusa*.

L. Kesselringii (Kesselring's). *fl.* red on the outside, white variegated with red inside, bearded in the throat of the tube, which is not gibbous at base. *l.* lanceolate or elliptic-lanceolate, acute, pale beneath. Kamtschatka, 1890. A dwarf, much-branched shrub, allied to *L. nigra*.

L. Korolkowii (Korolkow's). *fl.* yellowish-white. *fr.* orange-red. 1894. A very free-flowering, bush Honeysuckle, allied to *L. Xylosteum*. (G. & F. 1894, vii., p. 34, f. 4.)

L. K. floribunda (abundant-flowered). *fl.* pale rose-coloured, about ¾in. long, very numerous, lateral on short twigs. *l.* shortly petiolate, ovate, obtuse, rounded or sub-truncate at base, greyish-green. Persia, &c., 1889. A much-branched, slightly tomentose shrub.

L. longiflora. The correct name is *L. macrantha*.

L. Maacki (Maack's). *fl.* white, numerous, axillary, with a narrow funnel-shaped tube and a two-lipped limb of five segments, of which four are united and spread in one direction, the fifth lobe taking the opposite one. *l.* ovate-elliptic, acuminate, rounded at base. *h.* 10ft. to 15ft. Manchuria, 1884. A rather pretty, much-branched shrub. (R. G. 1162.)

L. macrantha (large-flowered). The correct name of *L. longiflora*.

L. micrantha (small-flowered). *fl.* pale pink, eventually turning yellowish, small. *fr.* red, small. *l.* varying from lanceolate to obovate, nearly glabrous or slightly hairy. Turkestan, 1889. A tall bush. SYN. *L. tatarica micrantha*.

L. minutiflora (minute-flowered). A garden hybrid between *L. micrantha* and *L. chrysantha* (*Morrowi*).

L. misera (miserable). A garden hybrid between *L. micrantha* and *L. Xylosteum*.

Lonicera—*continued.*

L. muendeniensis (Muenden). *fl.* white or yellowish-white. *fr.* red, ovoid. Branches arching; twigs erect, softly hairy. 1893. A garden hybrid between *L. bella* and *L. gibbiflora*. (R. G. 1893, p. 102, f. 18, 4-6.)

L. muscaviensis (Muskau). *fl.* white. *fr.* red. 1893. A garden hybrid between *L. chrysantha* (*Morrowi*) and *L. Ruprechtiana*. (R. G. 1893, p. 100, f. 18, 1-3.)

L. nigra (black). *fl.* pale rose, borne in pairs; peduncles scarcely shorter than the leaves. *fr.* black, sub-globose. *l.* ovate-oblong, entire, shortly petiolate, villous when young, nearly glabrous when adult. *h.* 4ft. Stems erect. Europe, &c., 1597.

L. notha (bastard). A garden hybrid between *L. Ruprechtiana* and *L. tatarica*. The following forms are grown in Continental gardens: *alba* (white), *carneo-rosea* (flesh-pink), *gilva* (pale yellow), *grandiflora* (large-flowered), *ochroleuca* (yellowish-white).

L. occidentalis (Western). A form of *L. ciliosum*.

L. parviflora is a form of *L. glauca*.

L. Periclymenum belgica (Belgian). *fl.* reddish on the outside, yellowish within. Branches purplish. A more robust form than the type.

L. P. serotina (late). *fl.* redder than in the type, produced until the autumn.

L. permixta (much mixed). A garden hybrid between *L. macrantha* and *L. tatarica*.

L. præcox (early). This is a garden name for *L. Caprifolium*.

L. propinqua (related). A garden hybrid between *L. alpigena* and *L. involucrata* (*Ledebourii*).

L. punicea. The correct name is *Symphoricarpus puniceus*.

L. Ruprechtiana (Ruprecht's).* *fl.* pure white, on long peduncles. *fr.* red or yellow. June. *l.* ovate-lanceolate, acuminate, dark green above, greyish beneath. *h.* 10ft. to 12ft. Manchuria. There are many hybrids between this and *L. Morrowi*.

L. salicifolia (Willow-leaved). A garden hybrid between *L. micrantha* and *L. Ruprechtiana*.

L. segreziensis. The correct name of plants that have been grown in gardens under the names of *L. diversifolia* and *L. hispida*.

L. sempervirens is popularly known as Trumpet Honeysuckle.

L. s. fuchsioides (Fuchsia-like).* *fl.* of a beautiful reddish-orange outside, yellow in the throat, much longer than in the type. A fine variety; and *superbum* is another.

L. splendida (splendid).* *fl.* yellowish-white, about 1½in. long, disposed in terminal heads. *l.* connate, oblong or obovate-oblong, obtuse. Spain, 1890. (R. G. 1890, p. 65, f. 13.) SYN. *Caprifolium splendidum* (of gardens).

L. Standishii (Standish's). *See* under **L. fragrantissima.**

L. syringantha (tube-flowered). *fl.* pale pink, axillary, about ½in. long; corolla having a straight tube and spreading lobes; peduncles very short. *l.* in pairs, small, ovate, obtuse, rounded or almost cordate at base. North China, 1892. A tall, much-blanched, glabrous shrub. (R. G. 1892, p. 564, f. 115-16.)

L. tangutica. *fl.* yellowish, small, borne in pairs on slender peduncles; corolla tubular-funnel-shaped, very shortly five-lobed. *fr.* red, globose. *l.* ovate-elliptic, obovate, or oblong, glaucous beneath. Kansu, North China, 1891. (R. G. 1891, pp. 580-1, f. 104-5.)

L. tatarica grandibracteolata (having large bracteoles). This seedling variety is distinguished from the type in having very large, leafy bracts. 1891. (R. G. 1891, p. 486, f. 90.)

L. t. micrantha (small-flowered). A synonym of *L. micrantha*.

L. thibetica (Thibet).* *fl.* rose-tinted, small, fragrant, twin on the lateral branchlets. June. *l.* dark green above, glaucous beneath, small, whorled in threes. Branches arched. *h.* 1½ft. Western China, 1897. A compact, bushy shrub.

L. translucens (translucent). *fl.* somewhat resembling those of *L. quinquelocularis*, but of a darker yellow and slightly larger. *l.* ovate, acute, rounded or slightly cordate at base. Himalayas, 1889.

L. Webbiana (Webb's), of gardens. A synonym of *L. flavescens*.

L. Webbiana (of Wallich). A form of *L. alpigena*.

L. Zabelii (Zabel's). *fl.* of a bright, dark rose-colour. *fr.* coral-red, small, round. *l.* ovate, shortly stalked. 1893. A bushy shrub, hybrid between *L. floribunda* and *L. tatarica*. (R. G. 1893, p. 104, f. 19, 1-3.)

The following have also been introduced to Continental gardens: *L. gibbiflora*, *L. Maximowiczii*, *L. Sullivantii*.

LONTANUS. A synonym of **Borassus** (which *see*).

LOPEZIA includes *Jehlia*, *J. fuchsioides* being synonymous with *L. macrophylla*. *L. racemosa* is a synonym of *L. coronata*.

LOPEZ-ROOT. *See* **Toddalia aculeata.**

LOPHIA. A synonym of **Alloplectus** (which *see*).

LOPHIRA. *L. alata* is the correct name of the plant described on p. 298, Vol. II., as *L. africana.*

LOPHOCLINIUM. A synonym of **Podotheca** (which *see*).

LOPHOPHORA (from *lophos*, a crest, and *phoreo*, to bear; in allusion to the flower-bearing areola and tuft of hairs at the summit of the tubercles). The generic name proposed by J. M. Coulter, the American botanist, for *Anhalonium Williamsii* (SYN. *Echinocactus Williamsii*) and its form *Lewinii.*

LOPHOXERA. A synonym of **Celosia** (which *see*).

LOPSEED. *See* **Phryma.**

LORANTHUS (from *loron*, a strap, and *anthos*, a flower; in allusion to the shape of the petals). ORD. *Loranthaceæ.* A large genus (about 330 species) of stove, greenhouse, or hardy, parasitic shrubs, rarely terrestrial trees or shrubs, broadly distributed throughout the tropics, beyond which few extend. Flowers often beautifully coloured, small or long, hermaphrodite or by abortion diœcious; perianth double; calyx truncate or four- to six-toothed; petals four to six, valvate. Fruit baccate or drupaceous. Leaves entire, often thick or fleshy. *L. flavidus* is an interesting, hardy or half-hardy parasite, stated, in "Gartenflora," to be in cultivation in England; this is, however, doubtful. It may possibly be grown by sowing the berries upon the above-ground roots or on the branches of the Beech-tree.

L. flavidus (yellowish). *fl.* produced in small racemes from the previous year's growth; perianth yellowish, ¼in. long, having a slender tube, and four narrow, reflexed segments. *l.* opposite, petiolate, oblong, about 1½in. long, obtuse and thick. New Zealand, 1885.

LORD ABERDEEN'S PINE. *See* **Pinus Pinaster Hamiltoni.**

LORD PENZANCE'S HYBRID SWEET-BRIARS. *See* **Rosa.**

LORENTEA (of Lagasca). Included under **Pectis** (which *see*).

LORENTEA (of Ortega). A synonym of **Sanvitalia** (which *see*).

LOROGLOSSUM. Included under **Orchis** (which *see*).

LOTE. *See* **Zizyphus Lotus.**

LOTUS ARBOREUS. A synonym of **Carmichælia australis** (which *see*).

LOTUS, SACRED. *See* **Nelumbium.**

LOUREA (named in honour of Professor Loureiro, of Lisbon). ORD. *Leguminosæ.* A small genus (three or four species) of stove herbs, natives of tropical Asia and Australia, and allied to *Desmodium.* Flowers in terminal, simple or panicled racemes. Leaves stipellate; leaflets one to three. *L. Vespertilionis* has been introduced, but if is not of much horticultural value.

LOURYA (named in honour of Jules Louis Charles Boys de Loury). ORD. *Hæmodoraceæ.* A monotypic genus. The species is a very curious stove plant, with the habit of *Curculigo* and *Peliosanthes*, differing from the former in the stamens and basal ovules, and from the latter in the baccate fruit, the pericarp of which is not burst open when in a young state by the enlarging seeds. In general appearance this plant looks like an *Aspidistra*, but far showier by reason of its flowers and fruit. For culture, *see* **Peliosanthes.**

L. campanulata (bell-shaped).* *fl.* ¼in. across in a dense raceme; perianth pale yellow, with a purple disk, broadly campanulate, the limb of six broad lobes; raceme radical, about 3in. long, very dense. December and January. *fr.* bright blue, ovoid, obtuse, 1in. long and ⅔in. broad, produced in clusters. *l.* (with the petiole) 10in. to 20in. long, 3in. to 4in. broad, oblong-lanceolate, acute at both ends, radical. Cochin China, 1889. (B. M. 7482; R. H. 1889, p. 128, f. 32.) A beautiful plant.

LOW BLACKBERRY. *See* **Rubus canadensis.**

LOWIA (named in honour of Sir Hugh Low, C.M.G.). SYN. *Orchidantha.* ORD. *Scitaminæ.* A genus embracing three species of interesting, stove, perennial herbs, natives of Borneo, Perak, and the Malay Peninsula, resembling dwarf Heliconias in foliage, but with flowers like those of an Orchid, and having five stamens instead of one. For culture, *see* **Heliconia.**

Lowia—*continued.*

L. borneënsis (Bornean). *fl.* produced in short spikes close to the ground; sepals yellowish at base, purplish towards the apex, narrow linear-lanceolate, acute, 1in. long; petals blackish-violet, aristate, rather more than ¼in. long, the lowest linear, acuminate, 1in. long. *l.* elliptic-oblong, acuminate, bright green, 6in. to 8in. long, 2½in. to 3in. broad; petioles 5in. to 10in. long. Borneo, 1886. SYN. *Orchidantha borneënsis.*

L. longiflora (long-flowered). *fl.* 6in. long; sepals olive, linear-lanceolate, spreading; two smaller petals purplish, the third pure white, larger, lip-like; scapes 1ft. long, one-flowered. *l.* tufted, 3ft. long. Perak, 1896. Plant stemless. (G. C. 1896, xx., p. 652, f. 111.)

L. maxillarioides (Maxillaria-like). *fl.* in a lax panicle, with two or three branches; sepals spreading, 1½in. long; petals three, the lowest much the largest, green. June. *l.* distichous, tufted, lanceolate, 8in. to 9in. long; petioles long, erect. Root-stock shortly creeping. Malay Peninsula, 1894. Plant stemless. (B. M. 7351.)

LOXANTHUS. A synonym of **Phlogacanthus** (which *see*).

LOXOTIS. A synonym of **Rhynchoglossum** (which *see*).

LOXSOMA. Little can be said with certainty on the culture of *L. Cunninghami.* In its native habitat it is said to grow with the foliage exposed to the action of the air to such a degree that no other member of the tribe *Hymenophylleæ* could withstand, but at the same time with its roots, which are of a peculiarly wiry nature, constantly in water. The soil in which it is found in its native places is said to be a yellow loam of a very clayey nature, and this has proved to be the case with all the importations which we have seen. Little can be said about its propagation, beyond the fact that in a natural state it increases itself rapidly by means of its spores, which are produced in great abundance.

LOZOTÆNIA ROSANA. *See* **Rosa—Insects.**

LUDIA. Two species, natives of the Mascarene Islands, are referred to this genus. Flowers axillary, sessile or shortly pedicellate; sepals four or five; petals wanting. Leaves entire, serrated or (in the same specimen) incised.

L. heterophylla (variable-leaved), of Bory. A synonym of *Aphloia mauritiana.*

LUDOLFIA. A synonym of **Arundinaria** (which *see*).

LUDOVIA (named in honour of Louisa, Queen of Charles IV. of Spain). ORD. *Cyclanthaceæ.* A small genus (two species) of stove plants, with a thick, rooting caudex, natives of French Guiana and Brazil; they are very closely allied to **Carludovica** (which *see* for culture). Flowers disposed in dense spirals; spadices axillary, shortly pedunculate, oblong-cylindrical; spathes three to five, distichous. Leaves distichous, very large, thick, rigid, slightly sheathing at base, somewhat petiolate, lanceolate or almost spathulate, acute, crenate-toothed towards the apex.

L. crenifolia (crenate-leaved). *l.* sheathing, distichous, closely set, about 1½ft. long, dark green, leathery, obovate-lanceolate, slightly crenate, gradually tapering at base into an amplexicaul petiole about 8in. long. Amazons, 1893. (G. C. 1893, xiii., p. 442, f. 64.)

LUDOVIA (of Persoon). A synonym of **Carludovica** (which *see*).

LUEDDEMANNIA (named in honour of Herr Lueddemann). ORD. *Orchideæ.* A small genus of stove Orchids, natives of South America, closely allied to *Cycnoches* (under which it was included by the authors of the "Genera Plantarum"). Ovary velvety; sepals oblong, acute, fornicate; petals cuneate-oblong, acute; peduncle pendulous, very many-flowered. For culture, *see* **Catasetum.**

L. Lehmanni (Lehmann's) The correct name of *Cycnoches Lehmanni.*

L. Pescatorei (Pescatore's). *fl.* 1⅜in. in diameter; sepals dull yellow, with a little brown inside; petals and lip bright yellow; peduncles 3ft. long, bearing nearly a hundred flowers. July. *l.* leathery, glaucous, lanceolate. Colombia, 1848. The plant exhales an odour like that of decaying Oranges. (B. M. 7123.) SYNS. *Acineta glauca, Cycnoches Pescatorei* (P. F. G. i., p. 123).

Lueddemannia—*continued.*

L. Sanderiana (Sander's). This species closely resembles *L. Lehmanni*, but differs in the cream-colour of its flowers, especially in the lip, which is white with purple blotches and a cushion-like, hairy callosity of very dark purple. Colombia, 1897.

L. triloba (three-lobed). *fl.* yellow, numerous, with a few madder-brown blotches on the lip; peduncle 6in. long. *l.* lanceolate, 1ft. long. Pseudo-bulbs ovoid, 2½in. long. 1895.

LUFFA. Vegetable Sponge. This genus furnishes the Luffas largely employed in this country and elsewhere as bath-room accessories—whence the popular name above. The Luffas of commerce are the fibrous interior of the dried fruits. To the species described on p. 300, Vol. II., the following should be added:

L. ægyptiaca (Egyptian). *fl.* yellow, racemose, on long peduncles. *fr.* club-shaped, smooth, 5in. to 12in. long, ten-ribbed or somewhat ten-angled, edible. *l.* 4in. in diameter, reniform-orbicular, five-angled or somewhat five-lobed, toothed, dotted on both surfaces; petioles 2in. long. Native country doubtful; it is cultivated throughout the tropics. SYN. *L. cylindrica.*

L. cylindrica (cylindrical). A synonym of *L. ægyptiaca.*

L. Forskallii (Forskall's).* *fl.* sulphur-yellow. *fr.* small, ovoid, ribbed, with black seeds. Arabia, &c., 1894. A pretty climber.

LUHEA. According to the Kew authorities, *Luehea* is the correct spelling.

LUISIA. To the species described on p. 301, Vol. II., the following should be added:

L. Amesiana (Ames'). *fl.* about 1in. across, disposed in clusters at the sides of the stem; sepals and petals pale yellow, speckled and streaked with purplish-brown on the outside; lip very pale yellow, spotted with purplish-maroon. June. India, 1890. Habit resembling *Vanda teres.* (G. C. 1893, xiv., p. 52, f. 8.)

L. antennifera (antennæ-bearing). *fl.* pale green, with a purple lip as long as the sepals; petals linear, ⅓in. long; rachis of spike very stout, ⅓in. to 1½in. long. *l.* 3in. to 4in. long. Stem stout, elongated, 1ft. or more in length. Perak, &c. (R. X. O., t. 78, f. 2.)

L. brachystachys (short-spiked). *fl.*, sepals and petals green and rose-purple, shaped as in *L. teretifolia*; lip blackish-purple, yellow at base, obovate-oblong, rather thin, with usually strong parallel grooves or nerves. *l.* 2in. to 6in. long, slender. Tropical Western Himalaya. (R. X. O. i., t. 78, f. 1.)

L. Cantharis (beetle-like). *fl.* green and purple, 1in. across, the lip resembling a small beetle; raceme very short. *l.* terete, 6in. long. Stem elongated. Allied to *L. Volucris.* Birma, 1895.

L. teretifolia (terete-leaved). The correct name of *L. platyglossa.* SYN. *L. zeylanica.*

L. trichorhiza (hairy-rooted). *fl.* twice as large as in *L. teretifolia*; lip obovate-oblong, rather longer than the sepals, flat, grooved. *l.* 4in. to 6in. long, stout. Tropical Himalaya. Plant sometimes having an enormous development of downy roots. (H. E. F., t. 72; R. X. O., t. 77.)

L. Volucris (bird-like). *fl.* solitary in the axils, resembling small birds with outstretched wings; sepals and petals pale yellowish-green; lip dark purple, fleshy, pressed close to the stem, resembling a lepidopterous chrysalis. *l.* 3in. to 5in. long, stout. Stem stout, 6in. to 10in. long. Sikkim Himalaya, 1893. (G. C. 1893, xiv., p. 32, f. 9.)

L. zeylanica (Cingalese). A synonym of *L. teretifolia.*

LUMA. Included under **Myrtus** (which *see*).

LUMBRICUS. *See* **Worms.**

LUNANEA. A synonym of **Cola** (which *see*).

LUNARIA. To the species described on p. 301, Vol. II., the following variety should be added. The flat, silvery seed-pods of *L. annua* form the chief attraction of the plant.

L. annua variegata (variegated). *l.* irregularly margined with creamy-white. 1890.

LUPERUS RUFIPES. *See* **Red-footed Beetle.**

LUPINASTER. Included under **Trifolium** (which *see*).

LUPINUS. The many beautiful kinds which have of late years been introduced, especially in the Tree Lupins and in the varieties of *L. polyphyllus*, have made the genus still more valuable. The Tree Lupins may be flowered from seed the second season, and nothing could well surpass for quantity of fragrant blossom or for beauty

Lupinus—*continued.*

masses of *L. arboreus luteus* or of Snow Queen (Queen of the Snow). In the annual section there are kinds like *L. hybridus atrococcineus*, *L. Menziesii*, *L. subcarnosus*, whose decorative and free-flowering qualities it would be difficult to surpass. The principal cultural details are not to allow seed-pods to form, otherwise there will be but a brief blaze of beauty, and to give plenty of water. None of the Lupins transplant well. The perennial species like a rich soil, and in late spring a good mulching of rotten manure is of the greatest value.

To the species described on pp. 302-3, Vol. II., the following should be added. *L. albus* is grown on the Continent as a forage plant.

L. albo-coccineus nanus (white and scarlet, dwarf). *fl.* sweetly scented; spikes rich rosy-crimson half-way up, thence to the apex pure white, borne well above the foliage. Summer. 1887. This forms handsome, compact bushes, about 1ft. in height. (G. C. 1887, ii., p. 597.)

L. arboreus. There are varieties with lilac, yellow, purplish, and white flowers. The last-named (Snow Queen) forms a bush some 4ft. high, covered with fragrant white flowers. The yellow variety is very beautiful, and one of the best for cut flowers.

L. atrococcineus hybridus (dark scarlet hybrid).* *fl.* of a beautiful, crimson-scarlet, in long, terminal spikes. July and August. A very floriferous garden plant. (R. H. 1890, pp. 252-3.)

L. Cruckshanksii (Cruckshanks').* *fl.* very handsome; standard bluish-purple, deep yellow in the middle, paler towards the extremity, the margin reddish; wings deep purplish-blue, with a reddish spot at base; racemes large. July. *l.* pale; leaflets seven or more, usually nine, obtuse, sometimes mucronate. Stem almost arborescent. *h.* 4ft. to 5ft. Peru. Half-hardy. (B. M. 3056.)

L. densiflorus (dense-flowered). *fl.* white, stained with pink, or yellow, whorled in a dense spike, sub-sessile. July. *l.*, leaflets oblong-spathulate. *h.* 9in. California, 1833. Annual. (B. R. 1683.) SYN. *L. Menziesii* (of Agardh).

L. Dunnetti (Dunnett's). A synonym of *L. tricolor elegans.*

L. fallax (false).* *fl.* distinctly whorled; standard and wings about equal, the latter deep violet, the former white in the middle, changing to red; racemes pedunculate. *l.*, leaflets seven to nine, linear-lanceolate; acute, 1½in. to 2½in. long. *h.* 3ft. to 5ft. Mount Tamalpais, San Francisco. An ornamental, half-hardy, silvery-pubescent shrub.

L. Hartwegii (Hartweg's).* *fl.* of a beautiful blue, whitish on the keel, shortly pedicellate, almost whorled; spike 8in. to 12in. or more in length. July to October. *l.* long-petiolate; leaflets seven to nine, lanceolate-oblong, slightly mucronate; stipules linear, very long. *h.* 2ft. to 2½ft. Mexico. Usually grown as an annual, but doubtless a perennial. (B. R. xxv., t. 31; L. J. F. 100.)

L. H. cœlestinus (sky-blue). *fl.* of a lovely sky-blue. *h.* 2ft.

L. hirsutissimus (very hairy). *fl.* reddish-purple, alternate; pedicels bractless. July. *l.* few, spotted with pale green like those of a Pulmonaria; leaflets obovate, mucronulate. Stems sub-erect. *h.* 9in. California, 1838. A very hairy annual.

L. hirsutus (hairy).* *fl.* azure-blue, large, alternate or whorled in spikes 4in. to 6in. long. July and August. *l.* long-petiolate; leaflets oblong, digitate. Stem simple. *h.* 1½ft. to 2ft. France, &c. Of this very pretty annual there are varieties with white and pale rose flowers.

L. Menziesii (Menzies'), of Agardh. A synonym of *L. densiflorus.*

L. Micheneri (Charles Michener's). *fl.* not very ornamental, turning to a dull purplish or purplish-green soon after opening. Northern California, 1894. A prostrate, half-hardy perennial, very pretty in the early stages of growth.

L. mutabilis Cruckshanksii hybridus (hybrid). *fl.* varying in colour from blue to dark purple, scented, whorled in fives. *l.*, leaflets digitate, ovate-oblong. *h.* 3ft. to 4½ft.

L. m. versicolor (various-coloured). *fl.* showy, several shades of colour, purple, blue, and lilac. *h.* 3½ft.

L. nanus albus (white). A variety with pure white flowers.

L. polyphyllus albus (white). A white-flowered variety, growing about 3ft. high.

L. p. Foxii (Fox's). *fl.* a combination of deep blue and white. *h.* 2½ft.

L. p. Purple King. *fl.* rich purple. *h.* 3ft.

L. p. Somerset.* *fl.* a clear soft yellow. A beautiful variety.

L. pubescens (downy). *fl.* violet-blue with a white centre, whorled in sixes and disposed in long spikes. July to September. *l.*, leaflets digitate, lanceolate, velvety on both surfaces. Mexico, Guatemala, &c., 1844. Annual or biennial. (L. J. F. 100.)

L. subramosus (somewhat branched). A garden name for *L. subcarnosus.*

Lupinus—*continued.*

L. sulphureus (sulphur-yellow). *fl.* sulphur-yellow, slightly scented, whorled in very dense spikes 6in. to 8in. long. July and August. *l.*, leaflets oblong-lanceolate, velvety and slightly cottony. Stem robust, branched above. *h.* 1½ft. to 2ft. California, &c. Annual.

L. tricolor elegans (three-coloured, elegant). *fl.*, standard dark violet; wings and keel white; spike compact, 5in. to 8in. long. *l.* digitate; leaflets seven to nine, velvety beneath. Stems usually simple. *h.* 1½ft. Of garden origin. SYN. *L. Dunnetti.*

LUPSIA. A synonym of **Galactites** (which *see*).

LUPULUS. A synonym of **Humulus** (which *see*).

LURID. Of a dingy brown tint.

LUXEMBURGIA. *L. polyandra* is the correct name of *L. corymbosa.*

LUZURIAGA (of R. Brown). A synonym of **Geitonoplesium** (which *see*).

LYCASTE. These lovely winter- and spring-flowering Orchids cannot be too highly recommended to the notice of amateurs. The whole section is far better grown in the cool intermediate house, where they can have a liberal circulation of air through the lower ventilators whenever outside conditions permit. The cool house, under similar conditions to those provided for Odontoglossums, suits them well during the summer months; but they require a slightly higher temperature during the dull months of the year. The potting should be done in the early spring, using a compost of rough, fibrous peat and sphagnum, to which may be added a little loam and a liberal sprinkling of rough sand. The drainage should be clean and ample. Lycastes require a liberal amount of water during the active season of growth, and at no season of the year should they be allowed to become dry at the roots. Shading must also be carefully attended to by dropping the roof-blinds if the sun's power is likely to damage the foliage. The *L. Skinnerii* section embraces the most satisfactory varieties to cultivate.

To the species and varieties described on p. 304, Vol. II., the following should be added:

L. Ayeriana (Ayer's). This species much resembles *Cattleya citrina* in habit, but has drooping, green flowers, strap-shaped, glaucous-green leaves, and angular pseudo-bulbs. Peru, 1895.

L. candida (white). *fl.* about 2in. across; sepals pale green, spotted with light rose, reflexed at apex; petals smaller, whitish, tinted with light rose; lip purer white than the petals, with a few rose-purple spots, obovate-oblong, obscurely three-lobed; column white, spotted with rose; scapes 3in. to 4in. long. *l.* 9in. to 12in. long. Central America, 1852. (L. & P. F. G. ii., p. 37.) *L. c. Lawrenceana* (of gardens) is a form having all the segments tinted with rose.

L. ciliata (ciliated), of Veitch. A synonym of *L. Barringtoniæ.*

L. cinnabarina (cinnabar-red). *fl.* 4in. across, solitary on the scapes; sepals and petals ivory-white, with a tinge of green; lip of an Apricot-red; scape erect. *l.* large, broad. Peru, 1893. Allied to *L. mesochlæna.* (L. ix., t. 394.) SYN. *Maxillaria cinnabarina.*

L. citrina (citron-coloured). *fl.* large, thick and fleshy; sepals and petals lemon-coloured; lip white, marked lilac. Brazil. A robust but rare plant, with the habit of *Bifrenaria Harrisoniæ.*

L. Cobbiana (Cobb's). A synonym of *L. lanipes.*

L. cochleata (snailshell-like). *fl.* deep orange; sepals and petals obtuse, the latter hairy; lip nearly circular, not spotted, the lateral lobes rather acute, the central one emarginate, slightly crisped; column long, hairy. May. Mexico, 1851.

L. costata (ribbed). *fl.* very pale yellow; dorsal sepal oblong-lanceolate, the lateral ones broadly lanceolate-falcate, united at base in a conical spur; petals obversely lanceolate, shorter than the sepals; lip three-lobed, concave, the middle lobe roundish-cordate, recurved at apex, entire, the lateral ones short, ovate; bracts cucullate, acute. Pseudo-bulbs angular, ovate-conical, each terminated by two lanceolate, petiolate leaves. Colombia, 1842. (B. R. xxix., t. 15; L. v., t. 220; R. G. 1859, t. 620, 1885, t. 1141; W. O. A. viii., t. 384.) SYN. *Maxillaria costata.*

L. cristata Randi (Rand's). A synonym of *L. Randi.*

L. c. Modiglianiana (Cavaliere Modigliani's). *fl.* white, except the anther, which is yellow. 1888. (L. iii., t. 117, under name of *Paphinia Modiglianiana.*)

L. cruenta gigantea (gigantic). A large and deeply-coloured form. 1894.

L. Denningiana (Denning's). *fl.* almost as large as those of *L. gigantea*; sepals and petals whitish-green, the latter rather

Lycaste—*continued.*

smaller than the former; lip reddish-brown, the front lobe oblong, blunt, toothleted, reflexed, the disk bearing a large, rhomboid, acute appendage. *l.* cuneate-oblong. Pseudo-bulbs broadly pyriform, furrowed, glaucous. Ecuador.

L. Deppei punctatissima (much-dotted). *fl.* whitish-green, thickly marked with small, dark purple dots; lip yellow, having radiating, purple lines. Guatemala, 1882.

L. grandis (large). *fl.* chocolate-brown, barred on the lower half of the lanceolate, acuminate sepals and petals with yellowish-green and cream-colour, the edges creamy; lip with a blackish-purple claw, widening into an oblong, obtuse, creamy front lobe, which is hairy on the apical portion, and has a pair of oblong lobes on each side of it, the two basal ones being incurved and pale chocolate-brown, and the two front ones horizontal and blackish-purple. Brazil, 1884. A curious Orchid. SYN. *Paphinia grandis* (W. O. A. iv., t. 145).

L. Harrisoniæ (Mrs. Harrison's). A synonym of *Bifrenaria Harrisoniæ.*

L. Jamesiana (James's). A form of *L. Skinneri.*

L. jugosa punctata (dotted). *fl.* greenish-yellow, spotted with reddish-black. 1883.

L. j. rufina (rufous). *fl.*, sepals pale yellowish-green; petals speckled with blackish-purple; lip marked brown. 1883.

L. Lawrenceana (Sir Trevor Lawrence's), of gardens. A form of *L. candida.*

L. leucantha (white-flowered). *fl.* 3in. to 4in. across, unattractive; sepals brownish-green; petals yellowish-white; lip trilobed, the side lobes light yellow, the middle one creamy-white, reflexed; column yellowish-white; scape 7in. to 9in. long. *l.* 20in. to 25in. long. Costa Rica, 1850. (L. & P. F. G. ii., p. 37; Ref. B. ii., t. 102.)

L. Lindeniana (Linden's). *fl.* large and showy; sepals and petals lanceolate, acuminate, the central part dark reddish-purple (broken up into lines and spots on the sepals), the margins white; lip white, with a dark purplish-brown base, the front lobe hastate, with numerous filiform and papillate crests. *l.* elliptic, acute. Pseudo-bulbs oblong-ovoid, 2in. to 2½in. long. Orinoco. SYN. *Paphinia Lindeniana.*

L. locusta (locust-like). *fl.*, sepals 2½in. long; lip fringed; column white, the remainder of the flower described as "grasshopper-green." 1893. This species is allied to *L. costata.*

L. Luciani (Lucian Linden's). *fl.*, sepals pale brown, spotted with pink; petals white, with dots of a rosy tint; lip pink and white. 1893. Allied to *L. lasioglossa.* (L., t. 412.)

L. Macrobulbon (having large pseudo-bulbs).* *fl.* fragrant, 3in. across; sepals greenish-yellow; petals bright yellow, reflexed at the tip; lip bright yellow, sometimes red-spotted on the terminal lobe; column bent, yellow, red-spotted. *l.* 15in. to 20in. long. Pseudo-bulbs pear-shaped, 3in. long. Colombia, 1844. SYN. *Maxillaria Macrobulbon* (B. M. 4228). *L. Youngii* (L., t. 368) is a slight variety of this species. 1893.

L. macrophylla (large-leaved). *fl.* bold; sepals olive-green; petals pale nankeen-sulphur, nearly as long as the sepals, broadly rounded and undulated at the extremity; lip pale sulphur, spotted purple on the edges of the lobes, and having a tongue-shaped appendage. *l.* ample, lanceolate, plaited. Pseudo-bulbs large, ovate, ribbed. Caraccas, 1837. (W. O. A., t. 230.) SYNS. *L. plana* (B. R. 1843, t. 35), *Maxillaria macrophylla.*

L. m. Measuresiana (Measures').* *fl.*, sepals reddish-brown, tipped green, green outside; petals and lip white, densely spotted rose-purple, except on the margins of the petals. Bolivia, 1837. A beautiful, free-flowering variety. (W. O. A. vii., t. 306, under name of *L. plana Measuresiana.*)

L. macropogon (large-bearded). *fl.* orange-coloured, larger than in *L. Macrobulbon* (to which this species is allied); sepals oblong, acute, hairy at base; petals smaller; lip three-lobed, the front lobe cuneate-oblong, acute, hairy, with a broad, rhomboid tubercle at base. Costa Rica, 1888.

L. Mastersiana (Dr. Masters').* *fl.* freely produced; sepals greenish-brown; petals and lip of a deep (almost orange) yellow. 1891. A fine species.

L. plana (flat). A synonym of *L. macrophylla.*

L. Randi (Rand's). *fl.* 2½in. in expanse; sepals and petals purplish-red, transversely barred, and longitudinally striped along the margins, with white; lip marked with the same colours, crested; peduncles two-flowered. *l.* 3in. to 4in. long. Pseudo-bulbs ellipsoid, about 1in. long. 1886. (L. 30.) SYNS. *L. cristata Randi, Paphinia Randi.*

L. Rossiana (H. J. Ross's). *fl.*, sepals greenish-yellow, oblong, acute; petals broader, deep orange-yellow, with a few brown dots near the base; lip yellow, faintly barred with brown, three-lobed. Tropical America, 1893. Allied to *L. cruenta*, but with smaller flowers and a differently-formed lip.

L. rugosa (wrinkled).* *fl.* creamy-white, covered with red spots, which now and then become confluent, large, of a waxy appearance; raceme pendulous, two-flowered. *l.* thin, linear, acuminate. Pseudo-bulbs very small, terete, furrowed.

Lycaste—*continued.*

Colombia, 1882. A remarkable and attractive Orchid, of dwarf growth. SYN. *Paphinia rugosa.* (R. ser. ii., i., t. 11.)

L. Schilleriana (Schiller's). *fl.*, sepals greenish-brown, about 4in. long, spreading; petals pure white, smaller, converging over the base of the lip; lip pure white in front, with a faint tinge of yellow at the base; scapes about 6in. high. *l.* and pseudo-bulbs as in *L. Skinneri*, but the leaves more erect. Central America. (Ref. B., t. 134.)

L. S. Lehmanni (Lehmann's). *fl.* having the petals dotted with red on the inside, and the lip marked with rosy-carmine. 1890. (R. G., t. 1321.)

FIG. 540. FLOWER OF LYCASTE SKINNERI ALBA.

L. Skinneri alba (white).* *fl.*, sepals and petals pure white; lip white, with the faintest tinge of yellow about the centre; the tongue-shaped appendage yellow. Guatemala, 1841. (F. M. ser. ii. 35, f. 1.) See Fig. 540.

L. S. armeniaca (orange).* *fl.* having the lip of a lovely apricot colour. 1891. (R. ser. ii., t. 18.)

L. S. imperator (emperor). *fl.* very large; sepals bright rose-pink; petals crimson; lip mottled with crimson. 1888.

L. S. Jamesiana (James's). *fl.* white, except the base of the petals and inside of the column, which are rich magenta. 1889.

L. S. purpurea (purple). *fl.*, sepals pale rose, shaded with purple; petals deep rose-purple, spotted with vinous-purple; lip white, slightly tinged with yellow. 1893. A beautiful variety. (L., t. 379.)

L. Wittigi (Wittig's). *fl.*, lip convex, the blunt, emarginate mid-lobe covered with hairs, white outside, with small purplish hairs on the mid-lobe, the side lobes acute, rather large, striped with dark purple, the disk dark violet-purple. Otherwise resembling *L. tetragona.* Rio de Janeiro, 1878.

L. xytriophora ("probably from *xystron*, an instrument for scraping, planing, or polishing, in allusion to the shape of the plate on the lip—if so, the name should be *xystrophora*" [Veitch]). *fl.* 3in. to 4in. across; sepals light greenish-brown; petals yellowish-green at base, white above; lip white, small, sometimes stained with rose-pink on the inner side, the plate yellow, spotted with red; scapes 4in. to 5in. long. *l.* 1ft. to 1½ft. or more in length. Northern Peru, 1867. (Ref. B. ii., t. 131.)

L. Youngii (Young's). A form of *M. Macrobulbon.*

L. consobrina, *L. mesochlæna*, *L. tricolor*, and *L. viridis* are also included in the Kew Collection.

The following desirable hybrids have been raised:

NAME.	PARENTAGE AND RAISER.
Balliæ	*Skinnerii* and *plana Measuresiana* (Ball).
Imschootiana ..	*Skinnerii* and *cruenta* (Imschoot).
Janetæ	*Skinnerii* and *Rossiana* (Ross).
Mary Gratrix..	*Skinnerii* and *plana Measuresiana* (Gratrix).
shoenburnensis	*Skinnerii* and *Schilleriana* (Emperor of Austria's garden).

LYCHNIS. Including *Silenopsis.* The following are British plants: *L. alpina*, *L. diurna*, *L. Flos-cuculi*, *L. Githago* (correct name *Githago segetum*, Corn Cockle), *L. vespertina*, and *L. Viscaria* (Rock Lychnis). To the species and varieties described on pp. 305-6, Vol. II., the following should be added. **Agrostemma** (which *see*) is included hereunder by Bentham and Hooker.

L. alba (white). White or Evening Campion. *fl.* white, solitary, diœcious; calyx hairy, green, long. Plant more viscid. Otherwise resembling *L. dioica.* Europe.

L. Bungeana (Bunge's). A synonym of *L. grandiflora.*

L. chalcedonica. Of the three varieties of this brilliant species, *L. c. alba plena* and *L. c. flore-pleno* are excellent, the white single form being poor in comparison.

L. Cœli-rosa (Rose of Heaven). The correct name of *Agrostemma Cœli-rosa.* The plant is also sometimes found under the name of *Viscaria oculata.*

L. coronaria. This is the correct name of the plant described and illustrated under *Agrostemma coronaria*, in Vol. I. There are also three varieties far superior to the type in *A. c. atrosanguinea*, *A. c. grandiflora*, and *A. c. hybrida splendens.* All are very select herbaceous subjects.

L. corsica (Corsican).* *fl.* pale pink, afterwards changing to bright pink, and finally assuming a reddish hue, somewhat resembling Alpine Pinks, and produced in great profusion upon wiry, branching stems. Summer. *h.* 2ft. to 3ft. A very pretty annual, though scarce. SYN. *L. Loiseleuri.*

L. dioica (diœcious). The correct name of *L. diurna.* Of this there are two very beautiful double forms, white and red respectively—*L. d. alba plena* and *L. d. rubra plena.*

L. Flos-cuculi rosea plena (pink, double) A semi-double form. 1894.

L. Flos-Jovis is the correct name of *Agrostemma Flos-Jovis.*

L. fulgens grandiflora is now regarded as a species.

L. f. Haageana grandiflora (large-flowered). *fl.* of a greater variety of colours, and larger than in the type. 1893.

L. grandiflora (large-flowered). The correct name of *L. fulgens grandiflora.* SYN. *L. Bungeana.*

L. Haageana (Haage's).* A form of *L. fulgens.*

L. hybrida (hybrid). *fl.* variable in colour, usually crimson or scarlet, disposed in close, symmetrical heads. *h.* 2½in. to 3ft. A hybrid between *L. coronaria* and *L. Flos-Jovis.*

L. Loiseleuri (Loiseleur's). A synonym of *L. corsica.*

L. oculata is a form of *L. Cœli-rosa.*

L. speciosa (showy) is probably a salmon-scarlet-flowered form of *L. grandiflora.* Japan, 1871.

L. Viscaria alba (white).* A handsome white-flowered form.

L. V. splendens plena (double). A splendid rose-coloured double variety.

LYCIMNIA. A synonym of **Melodinus** (which *see*).

LYCIUM. The species are broadly distributed over temperate and sub-tropical regions. To those described on pp. 306-7, Vol. II., the following should be added:

L. pallidum (pale). *fl.* green or tinged with purple, solitary or in pairs, axillary, pedicellate; corolla ⅜in. long, with broad, spreading lobes. *fr.* bright red, nearly ⅜in. long. *l.* oblanceolate, 1in. to 2in. long, very pale. Branches somewhat drooping, with a few long, slender spines. *h.* 3ft. New Mexico, Arizona, &c., 1883. Deciduous. (G. & F. 1888, i., p. 340, f. 54.)

L. ruthenicum (Russian). This only differs from *L. europæum* in slight botanical features.

L. Trewianum (Trew's). A synonym of *L. chinense.*

LYCOPODIUM. To the species described on pp. 307-8, Vol. II., the following should be added:

L. clavatum. A popular name for this species is Wolf's Claw.

L. cordifolium (cordate-leaved). A synonym of *Selaginella cuspidata elongata.*

L. Hippuris (Horse-tail). A synonym of *L. squarrosum.*

L. Mooreanum (Moore's). Stems erect, branched, 3ft. long. *l.* closely placed, short, pale green, bearing the sporangia in their axils. Brazil, 1892.

L. obscurum (obscure). The correct name of *L. dentroideum.*

L. squarrosum (squarrose). The correct name of *L. Hookeri.* SYN. *L. Hippuris.*

L. ulicifolium (Ulex-leaved). Stems dichotomous, 2ft. long and about ⅛in. thick, densely clothed with bright green, linear-lanceolate, very sharply-pointed leaves. Himalayas, 1880. A pendulous, stove or greenhouse species.

L. uliginosum is now transferred to *Selaginella.*

L. complanatum, *L. nummularifolium*, and *L. strictum* are also grown in botanical establishments.

LYCORIS. According to J. G. Baker, this genus consists of five species, confined to China and Japan. Flowers red or yellow; perianth funnel-shaped, rather irregular, the tube short, cylindrical, dilated at the apex, sometimes scaly at the throat, the segments unguiculate; stamens inserted near the throat of the tube; filaments long; umbels many-flowered; peduncle solid. Leaves linear or lorate, not usually developed with the flowers. Rootstock a bulb with membranous tunics and a short neck.

Although in the majority of cases these bulbs are best grown in a greenhouse, yet in favoured soils and situations, as under a south wall, *L. sanguinea* and *L. squamigera* will thrive. *L. aurea*, known in America as the Golden Spider Lily, needs a temperature of some 65deg. and to be carefully rested.

To the species described on p. 308, Vol. II., the following should be added:

L. radiata alba (white).* *fl.* white, tinged with pale yellow at the base of the segments. Japan. A fine variety.

L. r. variegata (variegated). *fl.* crimson, very large, edged with white when fading. 1889. SYN. *L. Terracianii.*

L. sanguinea (bloody). *fl.* dull red (Baker gives the flowers as bright red); perianth erect, 1½in. to 2½in. long, the segments neither crisped nor deflexing; umbel four- to six-flowered; peduncle slender, 1ft. to 1½ft. long. July and August. *l.* three to seven, produced after the flowers, linear, ⅛in. broad. Bulb ovoid, 1in. in diameter. Japan, 1888. More curious than beautiful.

L. s. purpurea (purple).* This is a pretty variety of the above. 1898.

L. Sewerzowi. The correct name is *Ungernia trisphæra.*

L. squamigera (scale-bearing). *fl.* rosy-lilac, fragrant; perianth 3in. long, the segments ½in. broad above the middle; umbel four- to seven-flowered; peduncle stout, 2ft. long. July and August. *l.* five or six to a bulb, produced in spring, above 1ft. long, ⅜in. to 1in. broad. Bulb large, globose. Japan, 1888. (B. M. 7547; G. & F. iii., p. 176, f. 32.) SYN. *Amaryllis Hallii* (of gardens).

L. s. purpurea (purple).* *fl.* a combination of lilac and bright purple. *h.* 1½ft.

L. Terracianii (Terraciani's). A synonym of *L. radiata variegata.*

LYCOSA. *See* **Spiders.**

LYGISTUM (of P. Browne). A synonym of **Manettia** (which *see*).

LYGODICTYON. Included under **Lygodium** (which *see*).

LYGODIUM. Climbing Ferns. Including *Hydroglossum*, *Lygodictyon*, and *Ugena.* All the species luxuriate in rich, spongy soil of an open nature, that which suits them best being a mixture of peat or good leaf-mould, loam, and chopped sphagnum, in about equal

FIG. 541. PINNA AND FERTILE PINNULE OF LYGODIUM RETICULATUM.

proportions. *L. reticulatum* (see Fig. 541), however, requires a soil of a slightly more substantial nature. It must also be borne in mind that they require an abundance of water at the roots, and are greatly benefited by frequent and copious syringings during their most active season, from May to October. It is only when planted out that these singular Ferns show themselves to advantage and attain their full development, and in that condition they are also less liable to the attacks of pests than when they have their roots restricted in pots.

Propagation is effected by means of spores, when the plants are required in quantities, and such is the method usually adopted for producing strong, healthy plants of *L. japonicum.* Most of the other species are increased by division of the crowns, which operation may be safely done at any time between March and September.

L. dichotomum is a species well adapted for covering large pillars, as it is of very robust growth and most effective; its foliage, though somewhat massive, is very elegant, and remains on the plant for a very long time. It is not unusual to find specimens of this species trained on pillars and against the glass, as in the large Tropical Fernery at Kew Gardens, where they retain their foliage for three or even four years.

L. japonicum is the most popular member of the whole genus, and thousands of plants find their way to the markets, where it is known only under the name of *L. scandens.* The consequences of this mis-naming are that in many, if not all, private establishments the plant is found under the spurious name, whereas the true *L. scandens* (see Fig. 542), which is a totally different plant, exists only in botanical gardens and in a few nurseries. *L. japonicum* is a delightful climber, producing shoots 8ft. to 10ft. long, of an exceedingly tender nature, and furnished with finely-cut foliage of a cheerful green colour, forming light festoons that are very useful for table-decoration. It is well adapted for growing in a Fern-case in the drawing-room, but in any case it should be placed near the light. The plant may also be grown in a basket, and in that way shows itself to the greatest advantage. A hanging-basket of small dimensions is of little use, as it does not afford sufficient scope for the

Lygodium—*continued.*

full development of the plant; but if a wire basket 12in. or 14in. in diameter is used, and three plants are at the outset put in it, one between each chain, it will, in a remarkably short space of time, make a specimen that has no equal for elegance; for while some of the strongest shoots are trained upwards along the chains and in the centre of the basket, those of medium growth, by being allowed to hang all around the sides, will soon completely cover it.

To grow *L. palmatum* well and to freely produce its handsome, fertile fronds, whose fructification, borne in miniature catkins, ripen about September, this species requires a very porous soil. The best mixture is good leaf-mould and chopped sphagnum in equal parts, with an abundance of water at the roots all the year round, but principally from March to September.

Another species calling for special notice is *L. polystachyum*. Although very fond of moisture, it will not stand overhead syringing; and the same may be said of *L. venustum*, which requires plenty of space for development.

FIG. 542. LYGODIUM SCANDENS.

To the species described on pp. 308-9, Vol. II., the following should be added:

L. dichotomum polydactylum (many-fingered). An interesting crested form. 1894.

L. flexuosum (bending). A synonym of *L. dichotomum*.

L. lanceolatum (lanceolate). *primary petiole* short or obsolete; *secondary* about 1in. long; pinnules 8in. to 12in. long, 6in. to 10in. broad, with three or four uniform, coriaceous, glossy segments on each side, 4in. to 6in. long, ¾in. to 1in. broad, all stalked, articulated at the rounded or cuneate (never cordate) base. *spikes* one to two lines long, disposed in close rows along the edges of the fertile divisions. Madagascar. A robust species. SYN. *Hydroglossum madagascariensis*

Lygodium—*continued.*

L. pinnatifidum (pinnatifid).* *primary petiole* almost wanting; *secondary* often 1in. long; pinnules 8in. to 12in. long, 6in. to 12in. broad, with a ligulate-oblong terminal segment 3in. to 6in. long, ½in. to ¾in. broad, and three or four like it on each side, usually rounded or cordate, articulated at base, the lower ones (or all) short-stalked, sometimes hastate or pinnate below. *spikes* one to three lines long, in close rows along the edge of the leafy segments. Himalayas, &c.

L. scandens Fulcheri (Fulcher's). *cau.* semi-terete, pale brown, producing short branches. *fronds* in pairs, 6in. to 9in. long, 4in. to 6in. broad, having four to six or more pairs of shortly petiolate pinnæ; sterile pinnæ oblong-lanceolate, 2in. to 3in. long; fertile ones usually shorter, the little spikelets of fructification projecting from the marginal teeth. 1882. SYN. *Hydroglossum scandens Fulcheri.*

LYGUS. *See* **Potato—Insect Pests.**

LYNCEA. A synonym of **Melasma** (which *see*).

LYNGWORT. *See* **Veratrum album.**

LYNXFLOWER. *See* **Stanhopea tigrina.**

LYONETIA CLERKELLA. A destructive species of Moth, belonging to the *Tineidæ*, whose larvæ live in long, irregular galleries in the foliage of Apple, Cherry, Pear, Birch, and Hawthorn, causing considerable leaf-dropping and debilitation of the trees affected. Moreover the pest is double-brooded, which considerably adds to the trouble.

The Moths are ¾in. in stretch of wings, and are found in June and again in October, and they pass the winter in this state concealed in crevices, &c. The fore-wings are of a shining white, with fuscous suffusions, brown spots, and brownish longitudinal markings, though these are not very distinct. The hind-wings are dark grey. The larvæ are pale green, and when full-fed they assume the pupal state in an elongate, whitish cocoon suspended from the ends.

The chief symptoms of attack are a brownish patchy appearance upon the foliage which has been "mined." Unfortunately remedies are out of the question with insects feeding thus protected. When their presence is noted all that the fruit-grower can do is to collect all leaves which fall prematurely and burn them. Some growers have tried applications for preventing egg-laying in late spring; but such have not proved of much practical value. Trees known to have been attacked should be carefully examined in winter, and all perfect insects found should be destroyed. Where trunks are treated to a caustic potash solution in winter, numbers of the Moths are destroyed.

LYONIA. To the species described on pp. 309-10, Vol. II., the following should be added. One or two plants formerly classed in this genus are now referred to **Leucothoë.**

L. frondosa (leafy). A form of *L. paniculata*, having leafy, paniculate flowering branches.

L. paniculata is the correct name of *L. ligustrina.*

L. rubiginosa (reddish). *fl.* white; racemes short, axillary, congested, ferruginous. July. *l.* coriaceous, ovate, 1½in. long, acute at base, obtuse at apex, entire, shining and reticulate-veined above, the young ones lepidote-ferruginous beneath. St. Thomas' Island, 1736.

LYRATELY PINNATE. When the pinnæ become smaller towards the base of a leaf or frond.

LYSIMACHIA. To the species described on p. 310, Vol. II., the following should be added. *See also* **Steironema.**

L. brachystachys (short-spiked). A synonym of *L. barystachys.*

L. ciliata and **L. lanceolata** are now regarded as synonymous with *Steironema heterophyllum.*

L. davurica (Dahurian). A form or synonym of *L. vulgaris.*

L. nemorum (wood-loving). The correct name of *L. azorica.*

L. Nummularia aurea (golden).* A yellowish-leaved form, very useful for hanging-baskets, for trailing on the rockery, for window-boxes, and for covering the moist banks of the waterside.

L. paridiformis (Paris-like). *fl.* bright yellow, axillary. July. *l.* ovate, tapering to both ends. Central China, 1891. A remarkable species, resembling *Paris quadrifolia.* (B. M. 7226.)

L. salicifolia (Willow-leaved). A synonym of *L. ephemerum.*

LYSIONOTUS. To this genus two other species should shortly be added—*L. pauciflora* and *L. carnosa*. The former is stated by Mr. Hemsley to promise well; and the latter has been raised from seed at Kew, and is described as a dwarf shrub with white flowers, lilac-tinged, and borne in the axils of the leaves.

L. longiflora (long-flowered). A synonym of *Æschynanthus longiflora*.

LYSISTIGMA. A synonym of **Taccarum** (which *see*).

MABA. To the species described on p. 311, Vol. II., the following should be added:

M. natalensis (Natal). *fl.*, females solitary, axillary, subsessile; corolla ¾in. long, densely silvery-pubescent externally. *l.* on very short, puberulous petioles, ¾in. to 1in. long, ovate, oblong, or elliptic, obtuse, dark green above, pale and reticulate-veined beneath. South Africa. A much-branched, twiggy shrub.

FIG. 543. MACKAYA BELLA.

MACARANGA (a native name). Including *Mappa*. ORD. *Euphorbiaceæ*. A genus embracing upwards of eighty species of stove trees or shrubs, allied to *Ricinus*; they are confined to the Old World, and are chiefly Malayan. Spikes or racemes axillary or lateral, simple or slightly branched, or paniculate at the tips of the branches. Leaves alternate, petiolate, often large, entire or four-lobed. Only one species is known in gardens. For culture. *see* **Codiæum.**

M. Porteana (Marius Porté's).* *fl.* pale reddish, sessile, inconspicuous, in axillary, pyramidal, laxly-branched panicles, all male, except an occasional terminal female or bisexual. April. *l.* at the tip of the stem, peltate, orbicular-ovate, nearly 3ft. broad, dark green above with golden nerves, rosy beneath when young; petioles 2ft. to 3ft. long; stipules 3in. to 6in. long. Stem woody, erect, 4ft. to 4½ft. high, marked with triangular scars. Philippine Islands, 1883. Tree. (B. M. 7407; R. H. 1883, p. 176, f. 36.) SYN. *Mappa Porteana* (G. C. 1894, ii., p. 284).

MACARTNEY ROSE. *See* **Rosa bracteata.**

MACBRIDEA (named in honour of Dr. James Macbride, of South Carolina). ORD. *Labiatæ*. A small genus (two species) of glabrous or sparsely hairy, greenhouse perennials, natives of North America, and closely allied to *Physostegia*. Flowers purple or white, showy, sessile; inflorescence rather few-flowered, capitate. Leaves lanceolate or spathulate-oblong, repand-toothed or entire, minutely dotted. *M. pulchra* has been introduced.

Macbridea—*continued*.

It thrives in sandy peat and loam, with good drainage, and may be increased by cuttings in May.

M. pulchella (rather pretty). A synonym of *M. pulchra*.

M. pulchra (pretty). *fl.*, corolla rose-purple, 1in. long, streaked with a deeper hue and white, the upper lip entire. Late summer. *l.* oblong-lanceolate, mostly acute at both ends, tapering to the petioles, thinnish; floral ones ovate, acute. Stems simple, 1ft. or more in height. North California, &c., 1804. SYN. *M. pulchella*.

MACDONALDIA. A synonym of **Thelymitra** (which *see*).

MACFADYENA (named in honour of James Macfadyen, M.D., author of the "Flora of Jamaica," 1837). SYN. *Phryganocidia*. Including *Dolichandra*. ORD. *Bignoniaceæ*. A genus embracing about twenty-five species of tall-climbing, stove shrubs, natives of tropical America, closely allied to *Bignonia*. Flowers showy, on axillary peduncles; calyx membranous, broad; corolla tube long and rather broad, the limb sub-bilabiate, consisting of five rounded, spreading, slightly unequal lobes; stamens four, didynamous. Leaves tri- or bifoliolate, or sometimes decompound. For culture of the species here described, *see* **Bignonia.**

M. Dolichandra (Dolichandra). *fl.* red, one to three to a peduncle at the tips of the branches; calyx spathe-like, cut to the middle. *l.* opposite, each having two oblong leaflets and often ending in a tendril. Argentina, 1891. A highly glabrous, ornamental species. SYNS. *Dolichandra cynanchoides*, *Spathodea Dolichandra*.

M. corymbosa (SYN. *Spathodea corymbosa*) has also been introduced.

MACKAYA. There are few more beautiful greenhouse flowering shrubs than *M. bella*, whose showy lilac and purple-striped flowers are shown at Fig. 543. Where many fail with this shrub is in not pruning at the right time. This must be *after* the period of flowering, removing some 2in., or a little more, of each shoot.

MACLEAYA. A synonym of **Bocconia** (which *see*).

MACLURA. To the species described on p. 312, Vol. II., the following varieties should be added:

M. aurantiaca inermis (unarmed). *l.* larger than in the type. Branches spineless. 1896. (R. H. 1896, p. 33, f. 10.)

M. tinctoria (dyers'). A synonym of *Chlorophora tinctoria*.

MACODES. This genus now embraces about five species, differing from *Anœctochilus* in its spurless, sessile lip, with a three-lobed limb, the front lobe narrow-spathulate. To the species *M. Petola* (Fig. 544), described on p. 312, Vol. II., the following should be added:

M. javanica (Javanese). The correct name of *Anœctochilus javanicus*. (B. M. 7037.)

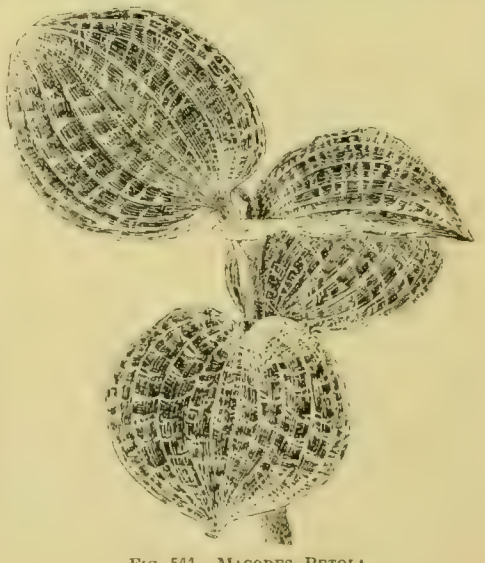

FIG. 544. MACODES PETOLA.

Macodes—*continued.*

M. marmorata (marbled). A synonym of *Dossinia marmorata.*

M. Petola superba (superb). A handsome, large-leaved form of one of the beautiful metallic-veined Orchids, having deep green leaves and golden markings, with open intervening spaces.

M. Sanderiana (Sander's). *fl.* pale green, borne on a scape 1ft. high. *l.* ovate, 4in. long, dark olive-green, with yellowish reticulations. Sunda Islands, 1895. SYN. *Anœctochilus Sanderianus.*

MACRADENIA. *M. mutica* is a synonym of *Trichopilia mutica.*

MACRÆA (of Lindley). A synonym of **Viviania** (which *see*).

MACRANOPLON (in part). Synonymous with **Phelipæa** (which *see*).

MACRO-. A prefix signifying large or long; *e.g.*, Macrophyllous, having large or long leaves.

MACROCERATIDES. A synonym of **Mucuna** (which *see*).

MACROCHILUS. A synonym of **Miltonia** (which *see*), the correct name of *Macrochilus Fryanus* being *Miltonia spectabilis.*

MACROCHLAMYS. Included under **Alloplectus** (which *see*).

MACROCHORDIUM. Included under **Æchmea** (which *see*).

MACROCLADUS. A synonym of **Orania** (which *see*).

MACROCNEMUM. A synonym of **Remijia** (which *see*).

MACROGYNE. A synonym of **Aspidistra** (which *see*).

MACROLEPIDOPTERA. *See* **Moths.**

MACROLINUM. A synonym of **Reinwardtia** (which *see*).

MACROLOBIUM VUAPA. The correct name of the plant described on p. 189, Vol. IV., as **Vouapa bifolia,** the genus *Vouapa* being merged by modern authorities under *Macrolobium.*

MACRONAX. A synonym of **Arundinaria** (which *see*).

MACROPIDIA [erroneously spelt *Macropodia*] (from *macropus*, a kangaroo, with suffix *ida*; in allusion to the popular name of the plant, viz., Kangaroo's Foot). ORD. *Hæmodoraceæ.* Kangaroo's Foot. A monotypic genus. The species is a cool greenhouse, perennial herb, with the habit and inflorescence of a paniculate species of **Anigozanthos** (which *see* for culture).

M. fumosa (smoky). *fl.* yellow, almost sessile in dense, unilateral spikes on the branches of the panicle; perianth tube ¾in. long, much incurved, the lobes very oblique, nearly 1in. long. June. *l.* radical or nearly so, 1ft. long, ½in. broad. Stem stout, 3ft. to 4ft. high. Australia. SYN. *Anigozanthos fuliginosus* (B. M. 4291).

MACROPODIA. *See* **Macropidia.**

MACRORHYNCHUS. Included under **Troximon** (which *see*).

MACROSCEPIS (from *makros*, long, and *skepe*, a covering; in allusion to the size of the calyx). ORD. *Asclepiadeæ.* A small genus (three or four closely-related species) of stove, climbing sub-shrubs, natives of Peru, Colombia, and Central America. Flowers rather large, in clustered, axillary cymes; calyx segments five, ovate-lanceolate; corolla tube ovoid or broadly cylindrical, the limb thick, five-lobed, broadly spreading. Leaves opposite, ample, cordate. *M. obovata*, the only species calling for mention here, requires similar treatment to **Physianthus** (which *see*).

M. elliptica (elliptic). *fl.* of a rich brown, soft and velvety, in clusters, and resembling those of *Hoya carnosa.* *l.* elliptic, bright green, and, like the stems, thickly covered with soft, felt-like, yellow-brown hairs. 1899. A stove climber, every part of which emits a strong scent when bruised.

M. obovata (obovate-leaved). *fl.*, corolla yellowish-brown, 1in. in diameter. November. *l.* shortly petiolate, 4in. to 6in. long, obovate, contracted above the cordate base. Western tropical America, 1884. Plant densely hirsute. (B. M. 6815.)

MACROSPHYRA (from *makros*, long, and *sphura*, a hammer; in allusion to the very long and robust style and the large bifid stigma). ORD. *Rubiaceæ.* A monotypic genus. The species is a stove, evergreen shrub. For culture, *see* **Gardenia** (to which this plant is allied).

M. longistyla (long-styled). *fl.* cream-coloured, fragrant, 1½in. to 3in. long, the style exserted nearly as much more; corolla tube hairy-pubescent, the limb ¾in. to 1¾in. across. June. *l.* oval, broadly ovate, or obovate, acuminate, cuneate or obtuse at base, 2in. to 7½in. long. Shoots tawny-hairy. *h.* 6ft. Western tropical Africa, 1845. SYN. *Gardenia longistyla* (B. M. 4322).

MACROSPORIUM SOLANI. *See* **Potato—Fungi.**

MACROSPORIUM TOMATO. *See* **Black Rot** (or **Black Spot**) **of Tomato.**

MACROSTIGMA (of Kunth). Included under **Tupistra** (which *see*), the correct name of *M. tupistroides* being *Tupistra macrostigma.*

MACROSTYLIS (of Breda). A synonym of **Corymbis** (which *see*).

MACROTOMIA (from *makros*, long, and *tome*, a cutting; in allusion to the long divisions of the calyx). SYN. *Leptanthe.* ORD. *Borragineæ.* A genus embracing seven or eight species of erect, hispid, perennial herbs, natives of the Himalayas and the Orient. Calyx five-parted, with long-linear segments; corolla funnel- or nearly salver-shaped, with a long, slender tube, and five broad, imbricated lobes; stamens five, included; cymes dense, corymbose or spicate. Nutlets four, or fewer by abortion. Leaves alternate. The two species introduced thrive in any well-drained garden soil, and may be increased by seeds.

M. Benthami (Bentham's). *fl.* sessile, 1in. long; calyx segments tipped purple; corolla lobes dark maroon-purple, triangular-ovate; thyrse 8in. to 12in. high. May. *l.*, radical ones 6in. to 10in. long, narrow-lanceolate, hirsute; cauline ones many, smaller, sessile, linear-lanceolate, acute. *h.* 1ft. to 3ft. Western Himalaya, 1884. Hardy. (B. M. 7003.)

M. cephalotes (headed).* *fl.* golden-yellow, large, pubescent; racemes large, head-like. *l.* silvery-canescent; radical ones 4in. to 5in. long, linear-lanceolate or lanceolate; cauline ones shorter, acuminate. Stem 6in. to 12in. high. Orient, 1896. A handsome alpine.

M. echioides (Echium-like). This is the correct name of the plant described as *Arnebia echioides*, in Vol. I.

MACROZAMIA (Swan River Fern Palm). To the information given on p. 314, Vol. II., the following should be added:

M. Fraseri. This plant is known in gardens by the names *Zamia Fraseri* and *Z. Miqueli.*

M. Hopei is, according to the "Index Kewensis," a good species, and not a variety of *M. Perowskiana* [more correctly spelt *Peroffskyana*].

M. Mackenzii is a form of *M. Miquelii.*

M. Pauli-Guilelmi (Paul William's). The correct name of *M. plumosa.* *Encephalartos Mackenii* is also identical with this species.

M. tenuifolia (slender-leaved). This equals *M. Pauli-Guilelmi.*

MADAGASCAR POTATO. *See* **Solanum indicum.**

MADEIRA VINE. A popular name for *Boussingaultia baselloides.*

MADIA. To the species, &c., described on p. 314, Vol. II., the following should be added:

M. Nuttallii (Nuttall's). *fl.-heads* sparsely paniculate, ¼in. high, usually slender-peduncled; bracts eight to twelve. Summer. *l.* linear-lanceolate, some or most of them opposite. Stem slender, 1ft. or more in height. North America. Perennial.

M. sativa racemosa (racemose). *fl.-heads* somewhat racemosely disposed; florets fewer than in the type.

M. viscosa is a form of *M. sativa.*

MÆRLENSIA. A synonym of **Corchorus** (which *see*).

MAGDALINUS PRUNI. *See* **Plum—Insect Pests.**

MAGNOLIA. Laurel-leaved Tulip-tree. When propagation by grafting is adopted, the deciduous kinds may be worked upon seedlings or rooted layers of *M. discolor*, or any vigorous-growing sort. *M. grandiflora* is the best

Magnolia—*continued.*

stock for the evergreen kinds. Magnolias should never be planted in imperfectly drained land, and positions having an eastern exposure should be avoided, because cold winds and late spring frosts disfigure the flowers and damage young growths. The best time to transplant is in early spring just before growth commences, and if watered overhead and at the roots they generally push forth strong growth, and recover themselves before autumn-moved plants.

To the species described on pp. 315-6, Vol. II., the following should be added:

M. conspicua Alexandrina (Alexandrine). This is the earliest to flower of the *M. conspicua* kinds.

M. c. Norbertiana (Norbert's). *fl.* purplish-tinted, large, stout. This is a late-flowering variety of the well-known *M. conspicua.*

M. c. speciosa (showy). A showy variety of *M. conspicua.*

M. fœtida (fœtid). A synonym of *M. grandiflora.*

M. fuscata. The correct name is *Michelia fuscata.*

M. glauca longifolia (long-leaved). A variety with lanceolate leaves, and flowering a long time.

M. grandiflora biflora (two-flowered). *fl.* usually in pairs, which open in succession. 1885.

M. hypoleuca (white beneath).* *fl.* creamy-white, very fragrant, 6in. to 7in. in diameter; petals six to nine, obovate-spathulate; filaments scarlet. *l.* biennial, 1ft. long, ovate-elliptic, obtuse or shortly cuspidate, glabrous above, densely white-pruinose beneath; petioles 1½in. long. Japan, 1893. Hardy. The wood of this very beautiful species is largely used by the Japanese for lacquered articles. (G. & F. 1888, p. 305.)

M. Kobus (native name). *fl.* creamy-white, 4in. to 5in. across, erect; sepals three; petals six; style reflexed. May. *l.* 6in. to 7in. long, 3in. to 3½in. broad, obovate, acuminate at both ends, deciduous; young ones pubescent beneath. *h.* 70ft. to 80ft. Japan. Hardy in the South of England. SYN. *M. Thurberii.*

M. Lenniei (Lennie's).* *fl.* purple on the outside and white within. A hybrid between *M. conspicua* and *M. obovata discolor.* (F. d. S. xvi., t. 1693; R. H. 1866, 370.)

M. obovata gracilis (slender). *fl.* dark purple outside. *l.* narrower than in the type. Plant smaller than *M. obovata.*

M. parviflora minor (smaller). This variety is smaller in all its parts than the type. Japan, 1888.

M. pumila (dwarf). The correct name of *Talauma pumila.*

M. pyramidata (pyramidal). A synonym of *M. Fraseri.*

M. salicifolia (Willow-leaved), of Maxim. *fl.* unknown. *l.* ovate, acute, silvery on the lower surface, emitting a delicious fragrance when bruised. Bark at first light green, eventually becoming dark reddish-brown. *h.* 15ft. to 20ft. Japan, 1893. A slender tree. (G. & F., Feb. 8, 1893, p. 65, f. 12.)

M. salicifolia (of gardens) is really a narrow-leaved form of *M. grandiflora.*

M. stellata. There is a variety of this with very pale rose-coloured flowers.

M. stricta (erect). A garden hybrid between *M. conspicua Soulangeana* and *M. obovata.* 1893.

M. Thompsoniana (Thompson's) is kept up by Sargent, who gives *M. glauca* as synonym.

M. Thurberii (Thurber's). A synonym of *M. Kobus.*

M. virginiana (Virginian). A synonym of *M. glauca.*

M. Watsoni (Watson's). The correct name of the plant figured in Gn., Dec. 8, 1883, as *M. parviflora.* (B. M. 7157.)

M. Wiesneri (Wiesner's). *fl.* pure white, very fragrant; stamens very numerous. *l.* deciduous, ovate-oblong, thick, 6in. to 8in. long, 3in. to 4in. broad, glaucous-green. Japan, 1889. A dwarf, bushy tree, glabrous in all its parts; probably hardy.

M. Yulan. The "Index Kewensis" gives this as the correct name of *M. conspicua.* There are numerous seedling varieties.

MAHERNIA. To the species described on p. 316, Vol. II., the following should be added:

M. chrysantha (golden-flowered). *fl.* golden-yellow; petals twice as long as the calyx. *l.* petiolate, elliptic-oblong, obtuse, crenulate, corrugated, at length glabrous above, white-tomentose beneath. *h.* 1ft. 1868. Under-shrub. (Ref. B. 26.)

MAHOGANY PINE. *See* **Podocarpus Totara.**

MAHOGANY, RED. *See* **Eucalyptus resinifera.**

MAIA. A synonym of **Maianthemum** (which *see*).

MAIANTHEMUM. *M. Convallaria* is the correct name of *M. bifolium.*

MAIDENHAIRS, GOLD AND SILVER. *See* **Nothochlæna.** *Polypodium vulgare* is also called Golden Maidenhair.

MAIDEN TREE. A term applied to a fruit tree that has not produced any fruit from the time it was sown; but as usually understood amongst nurserymen and gardeners, a fruit tree one year old from the time of budding or grafting is a Maiden Tree.

MAIETA (native name). ORD. *Melastomaceæ.* A small genus (two species) of small, slender, South American, stove shrubs, allied to *Clidemia. M. guianensis* has been introduced, but is probably no longer in cultivation.

MAINEA. A synonym of **Trigonia** (which *see*).

MAKART BOUQUETS. These are named after the famous painter, who utilised various dried Grasses, Everlastings, and Palm foliage for the decoration of his studio.

MALABAILA. The correct name of *M. Opopanax* is, according to the "Index Kewensis," *Opopanax Chironium.*

MALABAR NIGHTSHADE. *See* **Basella.**

MALACHIUM. Included under **Stellaria** (which *see*).

MALASPINÆA. A synonym of **Ægiceras** (which *see*).

MALAXIS. This genus now embraces about half-a-dozen species. Several that were formerly classed hereunder are now referred to **Brassia, Liparis, Microstylis, Oberonia,** &c.

MALCOLMIA [*Malcomia* is the correct spelling, according to the "Index Kewensis"]. Flowers loosely racemose, ebracteate; sepals linear, erect; petals long-linear or long-clawed. Siliquas nearly terete, elongated or subulate, generally on thick peduncles. Leaves alternate, entire or pinnatifid. To the species described on p. 318, Vol. II., the following should be added:

M. bicolor (two-coloured). *fl.*, petals pink, yellowish at base. Summer. *fr.*, siliquas erecto-patent, ¾in. to 1in. long. *l.* ovate or oblong-lanceolate, almost entire. *h.* 6in. Grecian mountains, &c. Plant pubescent.

MALE. Bearing only male organs.

MALESHERBIA LINEARIFOLIA. A synonym of *Gynopleura linearifolia.*

MALLET FLOWER. *See* **Tupistra.**

MALLOTUS (from *mallotos*, fleecy, woolly; in allusion to the fruit of some of the species). SYN. *Rottlera* (of Roxburgh). A genus embracing about seventy species of stove or greenhouse shrubs or trees, mostly found in the tropics of the Old World, allied to *Ricinus.* Flowers of both sexes racemose. Fruit capsular. Leaves alternate or opposite, petiolate, stipulate. *M. japonicus,* the only species calling for description here, may prove hardy in our southernmost districts. It may be increased by seeds, or by ripened cuttings, inserted in sandy loam, under a glass.

M. japonicus (Japanese). *fl.* inconspicuous, paniculate. May and June. *l.* 4in. to 6in. long, 2in. to 4in. broad, rhomboid-ovate, cuspidate-acuminate, entire, bearing minute yellowish glands beneath, at length glabrous on both sides; petioles equalling or shorter than the leaves. Branches woody. *h.* 10ft. to 15ft. Japan, &c., about 1890. (R. H. 1894, f. 32.) SYN. *Rottlera japonica* (S. Z. F. J. 79).

MALLOW, INDIAN. *See* **Sida** and **Urena.**

MALLOW, ROSE. A common name for various species of *Hibiscus.*

MALLOW-WORT. *See* **Malope.**

MALOPE. Mallow-Wort. Of *M. trifida grandiflora* there are pretty colour varieties in *alba* (white) and *rosea* (flushed with pink). All are beautiful subjects for the mixed border, or even for the shrubbery border.

MALPIGHIA. *M. coccigera* is the correct name of the plant described as *M. coccifera.*

EPIPHRONITIS VEITCHII.

MALVA. To the species, &c., described on pp. 318-9, Vol. II., the following should be added:

M. campanulata (bell-shaped). A synonym of *Malvastrum campanulatum.*

M. hastata (spear-shaped). *fl.* rosy-violet, borne on long stalks. Mexico (?), 1893. A garden annual.

M. mauritiana. The correct name is *Lavatera cretica.*

M. miniata (scarlet). A synonym of *Sphæralcea miniata,* described in Vol. III.

M. moschata rosea (rose). A pretty pink variety of the time-honoured Musk Mallow.

M. Munroana is synonymous with *Sphæralcea Munroana.*

M. sylvestris (wood-loving). *fl.* dark pink or violet, veined, long-pedunculate, erect. May to October. *l.* five- to seven-lobed, toothed. Stem erect, very slightly branched. *h.* 1ft. to 1½ft. Europe. Biennial.

M. zebrina (striped), of gardens, is a pretty Mallow often found in gardens. It varies as to colour, but is usually white, striped with purple. It should doubtless be referred to *M. sylvestris.*

M. Martensiana, a pink-flowered Australian species, has also been introduced.

MAMESTRA PERSICARIÆ. *See* **Dot Moth.**

MAMMILLA. A small teat-like prominence.

MAMMILLARIA. Anhalonium (which *see*) is now kept up as a distinct genus. With but few exceptions, all the cultivated Mammillarias may be grown in a warm, sunny greenhouse; or they may be placed in a frame with a south aspect, during summer, removing them into artificially-heated quarters for the winter. They do not like a large body of soil about their roots, but always thrive best when in comparatively small pots. If a sweet, new, fibry loam, mixed with broken bricks or cinders, be used to pot these plants in, they may then be left undisturbed at the root for several years. Much harm is often done to the more delicate kinds of Cactuses by repotting them annually. The pots should be well drained with crocks, and these covered with a layer of fibre sifted from loam. In summer, the soil should be kept moist, but never saturated; and after a bright, warm day, the stems may be moistened over by syringing them with tepid water. A point of much importance in connection with these, and indeed all tropical and extra-tropical plants, is, that the water used for watering or syringing them should be rain-water if possible, and never more than a degree or so colder than the plants themselves would be. Thus, a plant which had been standing in the full glare of a midsummer sun all day, would be much endangered by watering it with cold tap-water. Where proper arrangements for water are not made in a greenhouse or stove, it is a good plan to place the water wanted for the day's use in the sun along with the plants. A little bag, filled with soot and a weight, tightly tied at the neck, and placed in the water, is a good method for rendering hard tap-water suitable for the roots of plants. In winter, Mammillarias may be kept quite dry at the roots, except in mild, sunny weather, when a little water may be given. *M. vivipara* is quite hardy in New York, as also are several other kinds, whilst we learn that by planting them out in summer, and protecting them by means of a frame from heavy rain, dews, fogs, and sudden changes of weather, a good many species of both *Mammillaria* and *Echinocactus* are successfully managed in the neighbourhood of that town. Doubtless *M. missouriensis* will also prove equally hardy.

A collection of the most distinct kinds may be successfully managed in a glass case in a room window, providing the sun shines through it for a few hours in the day.

Propagation is usually effected by means of seeds, which may be procured from Continental seedsmen, as well as from our own. The treatment required by the seeds is similar to what has been already advised for those of other Cactuses. The tufted kinds are easily multiplied by separating the stems, or even by cutting off the tops and planting them in small pots of sandy soil. Some of the kinds (more especially the small-flowered ones) are often prettily studded over with bright red, coral-like berries, which are the little fruits, and contain, as a rule, matured seeds capable of reproducing the parent plant.

M. angularis is a robust kind, and when happily situated it forms a specimen 1ft. in diameter, owing to its freely-produced arm-like branches, which spread out and curve upwards. It requires a warm greenhouse temperature during winter, and exposure to bright sunshine at all times. *M. applanata* should be similarly treated. *M. atrata,* though rare in England, is worth attention because of the prettiness of its flowers and the attractive form of its stem. It will thrive in a cold frame, and requires protection from excessive wet only, rather than from cold. Grown in a warm house, it becomes sickly, and is short-lived. *M. bicolor,* one of the commonest of the Cactuses grown in English gardens, and one of the most distinct, if kept free from dust, which may be done by covering the plant with a bell glass, shows much beauty in the stem. It is one of the easiest to manage, and will thrive in a warm room-window if exposed to bright sunlight and kept dry in winter. *M. chlorantha* requires cool-house treatment, and should be kept free from dust, which disfigures the white spines.

Mammillaria—*continued.*

M. clava needs a warm greenhouse; but, unless it is kept in full sunshine both summer and winter, and perfectly dry during the latter season, it will not produce any flowers. As a flowering plant, it ranks amongst the very best of the Mammillarias. It may be easily propagated from seeds ripened on cultivated plants. *M. discolor* thrives when grown on a dry shelf in a warm house, and kept moist in summer, but perfectly dry in winter. *M. dolichocentra* is a native of Mexico, and flowers in summer. It succeeds in a tropical temperature, and enjoys a daily syringing overhead on bright days in summer, but in winter requires little or no water. A charming species is *M. echinata,* when grown in a warm house. A few pieces of broken brick should be placed upon the surface of the soil about the base of the plant, as the stems like to press against, or grow upon, anything in the nature of rocky ground.

Though rare in cultivation, *M. Echinus* succeeds in a warm greenhouse, with exposure to bright sunshine all the year round, a moderate supply of water in summer, and none at all during winter. A few large pieces of broken brick or sandstone placed in the soil, just under the base of the stem, afford the roots conditions suitable to their healthy growth. *M. elegans* requires greenhouse treatment.

M. elephantidens (see Fig. 550) grows quicker than is usual with plants of this genus, and it is also exceptional in the regular and abundant production of its flowers. It has been a rarity in European collections for many years, and, although easily grown, it is often killed through wrong treatment. A cool greenhouse or sunny frame in summer, plenty of water whilst growth is active, and a light, well-drained soil, suit it best; whilst during winter it must be kept perfectly dry, and protected only from frost. In a tropical house it is invariably sickly, and altogether unsatisfactory.

M. elongata and its varieties, *densa, intertexta, rufescens, rutila, subcrocea,* and *supertexta* may all be grown in a cold frame, or in a window where the sun can shine upon them; or they may be grown along with tropical kinds. For small cases in windows, these little Thimble Cactuses are amongst the most suitable.

M. floribunda is a handsome kind for window culture, and, if well supplied with fresh air, sunshine, and sufficient water to keep the soil moist, it will flower almost every year. It must have no water in winter.

M. longimamma requires greenhouse treatment; or it may be placed in a sunny frame out of doors during summer. It is not easily multiplied from seeds, but is free in the production of offsets from the base of the stem.

M. macromeris (see Fig. 552) is one of the most beautiful of all Mammillarias, and requires the same treatment as *M. longimamma,* except that, owing to the woody nature of its rootstock, and its long, tap-like roots, it should be planted in pans instead of pots, using a compost of rough loam, mixed with lumps of broken brick or limestone. *M. macrothele* is almost hardy in the warmer parts of this country, suffering from damp rather than frost in winter. It should be grown in a cool, well-aired greenhouse or frame, with the sun shining on it all day.

M. micromeris (see Fig. 545) and *M. Ottonis* are species that need much care under cultivation, water in excess

Mammillaria—*continued.*

being fatal, and a soil of the wrong sort soon killing all the roots. They may be grown in small pots, in a mixture of loam and lime rubbish, and a warm greenhouse.

M. multiceps should be grown on a shelf in a cool greenhouse—anything like a stove temperature being fatal to it. As a flowering plant it is of no value, but the compact tuft formed by its numerous stems, with their attractive spines, renders it worthy of cultivation.

M. pectinata (see Fig. 546) is attractive even when not in flower. It requires warm greenhouse treatment, with exposure to full sunshine. During late autumn it should have plenty of air to ripen the new growth made whilst flowering; in winter it should have a dry position near the glass.

M. pulchra, a rare kind nowadays, is one of the prettiest, and it should always be grown in a warm

FIG. 545. MAMMILLARIA MICROMERIS.

house. *M. pusilla* (see Fig. 547) should be grown in a frame in summer, and wintered on a shelf in a warm greenhouse. *M. pycnacantha* should be grown in a warm greenhouse all the year round. Old stems develop offsets from the base, by which the species may be multiplied.

M. Scheerii grows naturally in a red, sandy loam, and under cultivation requires warm-house treatment, except during the autumn, when it may be placed in a frame and exposed to full sunshine and plenty of air. *M. Schelhasii* (see Fig. 555) may be tried out of doors in a sunny position in summer if wintered on a shelf in a greenhouse. *M. Schiedeana* should be grown in a greenhouse where frost is excluded, and where there is plenty of sunlight at all times. It is easily increased, either from seeds or from the offsets produced at the base of old stems. *M. semperviva* needs to be grown in a frame in summer, and wintered in a cool greenhouse or frame.

For the rest, *M. stella-aurata* may be cultivated under a bell glass in a room window, the only danger being damp during winter. *M. sulcolanata* (see Fig. 558), a charming little plant, should be grown in a frame exposed to full sunshine all summer, and removed to a shelf in a warm greenhouse in winter. Grafted on to a Cereus or an Opuntia it is healthier than when on its own roots. *M. tuberculosa* may be grown in an ordinary greenhouse, on a shelf, in full sunshine. *M. uncinata*, like all the kinds with short, angular tubercles, is easily managed, and always ripens seeds. It may be grown in a frame, or even out of doors, all through the summer, removing it to a greenhouse for the winter; while *M. viridis* likes a sunny frame out of doors during summer, and a dry, warm greenhouse shelf in winter. In Utah and New York, *M. vivipara* is commonly cultivated as a hardy garden plant, bearing exposure to keen frosts and snow without suffering; but it would not thrive out of doors in winter with us, unless covered by a handlight during severe weather, and protected from

Mammillaria—*continued.*

heavy rains in winter. It likes a strong, clayey soil. *M. Wildiana* requires to be grown on a shelf in a sunny greenhouse, both in winter and in summer. *M. Wrightii* likes plenty of moisture and sunlight during the summer,

FIG. 546. MAMMILLARIA PECTINATA.

whilst making new growth; but in winter, when at rest, it ought to be kept on a shelf, and just moistened overhead in bright weather.

M. Zuccharíniana is a large, handsome-stemmed kind, easily kept in health, and flowering freely if grown on a shelf in a cool greenhouse in winter, and placed in a warm, sunny position out of doors in summer. It pro-

FIG. 547. MAMMILLARIA PUSILLA.

duces seeds freely, and pretty plants, 3in. or more in diameter, may be obtained in two years from seeds. By grafting it, when young, on the stem of a Cereus or a cylindrical Opuntia, a healthy, drumstick-like plant is easily obtained.

Mammillaria—*continued.*

To the species described on pp. 320-2, Vol. II., the following should be added. There are a host of names in Continental catalogues, but, as in the work proper, we have confined our attention to species and varieties actually in commerce here.

M. acanthophlegma (watery-spined). A synonym of *M. elegans.*

M. Alversoni (Alverson's). A variety of *M. radiosa.*

M. angularis. The correct name is *M. compressa.*

M. applanata. The correct name is *M. Heyderi.*

M. arizonica (Arizona). A variety of *M. radiosa.*

M. atrata. The correct name is *M. rhodantha.*

M. aulacothele (furrow-nippled). A synonym of *M. microthele.*

M. autumnalis (autumnal) A synonym of *M. mutabilis.*

FIG. 548. MAMMILLARIA COMPACTA.

M. barbata (bearded).* *fl.* rosy-pink, 1in. in diameter. *fr.* green, oblong, crowned with rudimentary flowers. Stem simple, depressed-globose; axils of the tubercles naked; prickles radiating in several series, very numerous, about forty white, hair-like outer ones, and ten to fifteen more robust inner ones, the central ones singularly robust, uncinate, fuscous, erect. New Mexico, 1885. (R. G., t. 1203, a-c, & t. 1400.)

M. bicolor nivea (snowy). Stem obovate, proliferous; tubercles conical, woolly and spine-bearing at apex, the axils woolly; outer spines white, appressed, hair-like, the inner four white, fuscous at apex, the longest 1in. long. Mexico.

M. bocasana (Bocas).* Stems globose, less than 2in. high; tubercles set in long, axillary, white wool; radial spines white and hair-like, the central four red, one of them hooked. Mexico. Stove. There is a variety *splendens.*

M. Brownii (Brown's). A synonym of *M. robustispina.*

M. Caput-Medusæ is a form of *M. Scheerpercivi.*

M. Carretii (Carreti's). *fl.* whitish, with rosy-streaked petals. Summer. Stem simple, rather small, depressed-globose; radial spines yellowish, rather long, spreading recurved, and interwoven. Mexico.

M. centricirrha (hooked cirrhi). *fl.* reddish-carmine. Stem proliferous; tubercles pyramidal, quadrangular; spines irregular, usually with four to twenty-four radials and one central; radial spines short, straight or curved, awl-shaped, ⅛in. long; central ones longer and stouter; young spines yellow. Mexico. SYN. *M. Schmidtii.*

M. chlorantha (yellow-flowered). A form of *M. radiosa*

M. cirrhifera longispina (cirrhi-bearing). A synonym of *M. mutabilis.*

M. compacta (compact). *fl.* yellow, tinged with brown outside, terminal, large. Stem globose, solitary; spines comb-like, all radial, whitish. Mexico. Allied to *M. pectinata.* See Fig. 548.

M. compressa (compressed). The correct name of *M. angularis.*

M. cornifera (horn-bearing). *fl.* unknown. *fr.* red, ⅜in. long. Stem globose, 3in. in diameter; tubercles oblong-ovate, ⅜in. long, crowded, the younger axils woolly; radial spines fifteen to twenty-six, rigid and horny, curved or straight, reflexed, yellowish, very sharp, ½in. long, the central one stouter and slightly deflexed, or sometimes wanting. Southern Mexico, 1845. SYNS. *M. dæmonoceras, M. impexicoma.*

Mammillaria *continued.*

M. cornimamma (horny-nippled). *fl.* light yellow, with a purplish stripe on the back of all but the innermost segments, 3in. broad. Summer. Stem sub-globose, about 2½in. in diameter, greyish-green, the axils and areolæ of the younger tubercles densely white-woolly; tubercles large, conical, grooved down the upper face; outer spines 10in. to 13½in. long, tipped brown, the inner ones one to three, dark brown, stouter and longer. Native country unknown, 1837.

M. crassispina (thick-spined).* *fl.* red. Late summer. Stem simple, ovate-columnar, shining green; tubercles cylindrical-conical, the axils almost naked; radial prickles twenty-four to twenty-seven, whitish, rigid, diaphanous, somewhat fascicled, much spreading, the inner six or seven irregularly disposed, with a central, nearly erect one, pink at base. Mexico. Very pretty; one of the best.

M. dæmonoceras (demon's-horn). A synonym of *M. cornifera.*

M. dasyacantha (thick-spined).* *fl.* small, ruby-like, springing from the centre. Stem 2in. to 3in. high, almost globular, covered with spiral whorls of tiny tubercles; spines arranged in little stars, with an erect central one. Mexico. A pretty Thimble Cactus.

M. dealbata (whitened). The correct name of *M. Peacocki.*

M. densa (thick) Though frequently catalogued as a species, this is but a variety of *M. elongata.*

M. deserti (desert-loving). A variety of *M. radiosa.*

M. discolor (two-coloured). *fl.* rose-purple, less than 1in. wide, very short. Stem globose, about 4in. in diameter; tubercles smooth, egg-shaped, their bases embedded in white wool, their tips crowned with stellate tufts of short, reddish spines. Mexico, 1829.

M. echinata (prickly).* Stem often multiplex, cylindrical, elongated; tubercles naked, broad at base, very short, obtuse at apex; young areolæ slightly tomentose; prickles bristle-like, sixteen to eighteen, radiating, spreading-recurved, yellow, much longer than the tubercles, the two central ones rigid, slightly fuscous. Mexico, 1885. (R. G., t. 1203, d-e.) By some this is regarded as a stout variety of *M. Halei.*

M. Echinus (hedgehog-like). *fl.* yellow, nearly 2in. long, cup-shaped, produced two or three together at the top of the stem. June. Stem about the size and shape of a small hen's-egg, completely hidden by the spines; tubercles ⅛in. long, arranged in thirteen spiral rows; spines white, radiating, with a central spike-like one. Mexico. Warm house. See Fig. 549

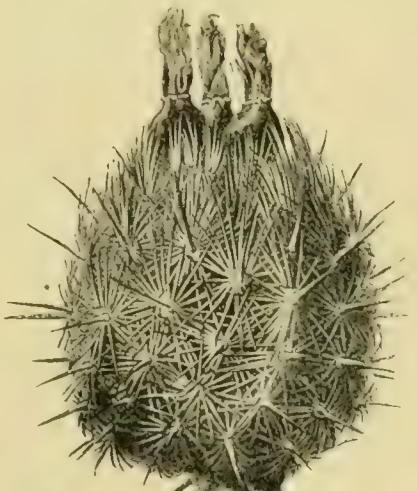

FIG. 549. MAMMILLARIA ECHINUS.

M. elegans (elegant).* *fl.* rarely borne in cultivation. Stem globose, 2in. high; tubercles small, conical, when young woolly at the tips; spines about twenty, whitish with brown tips, short and slender, arranged in a star on each tubercle, with four rather longer central ones. Mexico, 1850. SYNS. *M. acanthophlegma, M. Klugii,* and *M. Potosina* (of gardens).

M. elephantidens (elephant's-tooth). *fl.* 3in. wide; sepals violet, with white margins; petals bright rose, purple at base, a line of purple extending down the middle; stamens numerous,

Mammillaria—*continued.*

with purple filaments and yellow anthers. Autumn. Stem globose-depressed, 6in. to 8in. in diameter, bright, shining green; tubercles smooth, round, 1½in. long, furrowed across the top (which at first is filled with wool, but when old is naked), the base furnished with a dense tuft of white wool; spines recurved, radiating in groups of eight, springing from the furrows. Paraguay. See Fig. 550. There is a very spiny variety (*spinosissima*) in cultivation.

FIG. 550. MAMMILLARIA ELEPHANTIDENS.

M. elongata (elongated).* *fl.* tawny yellow, borne in the axils of the tubercles; petals ½in. long. *fr.* bright coral-red, as large as a Date-stone. Stems tufted, the tallest about the size of a man's thumb; tubercles short, crowded, hidden under the star-like clusters of reddish-yellow spines, all radial. Mexico. Suitable for frame or window culture. There are several varieties—*densa*, *intertexta*, *rufescens*, *rutila*, *subcrocea*, and *supertexta*—differing in the length and thickness of the stems or in the colour of the spines.

M. erecta (erect).* *fl.* of a beautiful citron-yellow, very large, scentless. May and June. Stem 1ft. to 1½ft. high, elongated-cylindrical, proliferous at base, of a bright glaucescent-green; tubercles dilated at base, obliquely attenuated and rounded at apex, the axils evanescently floccose-woolly; spines of a beautiful clear yellow, regularly disposed in rays. Mexico.

M. eriacantha (woolly-spined).* *fl.* yellow, small. June and July. Stem simple, cylindrical, elongated; tubercles crowded, acutely conical, four-sided, the axils woolly; radial spines twenty to twenty-four, bristly, yellowish, the two central ones straight and rigid, pubescent. Mexico.

M. formosa (beautiful).* *fl.* red, with lanceolate segments. June. Stem simple, somewhat club-shaped; tubercles somewhat tetragonal, with floccose wool in the axils; radial spines twenty to twenty-two, the six inner ones acicular, stellate, thick at base, black at each end. Mexico, 1847.

M. fulvispina (yellow-spined). A synonym of *M. rhodantha*.

M. Goodrichii (Goodrich's). *fl.* ½in. in diameter, lateral; petals yellowish-white, with red midribs. *fr.* scarlet, clavate. Stem 2in. to 3in. high, ovate-globose, almost simple; tubercles shortly ovate, woolly and bristly in the axils; radial spines eleven to fifteen, ¼in. long, whitish, the central three or four dark fuscous, the lower central one a little longer. San Diego, California. The specific name is sometimes misspelt *Goodridgii*.

M. Grahami (Graham's).* *fl.* rose-coloured, 1in. long, usually produced in a circle round the stem. June and July. *fr.* an oval berry, ½in. or more long. Stems globose, scarcely 3in. high, when old sometimes branching; tubercles ¼in. long, egg-shaped, corky when old; spines in tufts of about twenty, ¼in. long, all radiating except the hooked central one. Colorado. Very rare.

M. Grusoni (Gruson's). *fl.* yellow. Stem globose; tubercles four-sided, naked in their axils, each bearing fourteen radiate spines and two central ones, which are reddish when young but become white with age. Mexico, 1889. (R. G. 1889, p. 105, f. 20.)

M. Heeseana (Heese's). *fl.* carmine-red. Plant depressed-globose, when young clothed with soft, white wool intermixed

Mammillaria—*continued.*

with weak bristles, naked when old. Mexico, 1896. This plant has the longest spines of any Mammillaria yet discovered.

M. Heyderi (Heyder's). The correct name of *M. applanata*, *M. impexicoma*.

M. Hirschtiana (Hirscht's). *fl.* varying in colour from pink to dark red, large and numerous. Stems very spiny. 1897.

M. impexicoma (unkempt). A synonym of *M. cornifera*.

M. Klugii (Klug's). A synonym of *M. elegans*.

M. lasiacantha (woolly-spined).* *fl.* white, with pink stripes, small. Stems depressed, spreading, 1in. high, forming a dense tuft; tubercles small, crowded, hidden by the numerous spreading, wool-like, feathered spines, which are all radial. Texas, Arizona, &c. SYN. *M. Rungei*.

M. l. denudata (denuded). A variety with unfeathered spines.

M. l. plumosa (feathery). Spines longer and more distinctly feathered than in the type. North Mexico.

M. Lehmanni (of Link and Otto, B. M. 3634). The correct name is *M. macrothele*.

M. longimamma (long-nippled).* *fl.* citron-yellow, large and handsome, the short tube hidden in the tubercles; petals 1½in. long, narrow, pointed, all directed upwards; stamens short, numerous. Early summer. Stem seldom more than 4in. high, branching at the base when old; tubercles 1in. long, ½in. in diameter, terete, slightly curved, narrowed to the apex, each crowned with a tuft of about a dozen spines. Mexico. See Fig. 551.

FIG. 551. MAMMILLARIA LONGIMAMMA.

M. macromeris (large-parted). *fl.* about 3in. long and wide, arising from the centre of the stem; petals carmine, almost purple just before fading, regular and spreading as in the Oxeye Daisy. August. Stem about 4in. high, naked at base, woody and wrinkled when old; tubercles as in *M. longimamma*, but with curving, radial spines, like needles, often 2in. long, white or rose-tinted when young, almost black when old. Mexico. Owing to the woody nature of the rootstock, and the long, tap-like habit of the stouter roots, this should be planted in pans instead of pots. See Fig. 552.

M. macrothele (large-nippled). The correct name of *M. Lehmanni* (B. M. 3634).

M. missouriensis (Missouri).* *fl.* yellow or reddish, about 1in. long. May. Stem globose, nearly 1½in. in diameter, simple or nearly so; tubercles ovate-cylindrical, ½in. or more in length, slightly grooved; radial spines thirteen to seventeen, straight, whitish, setaceous, ⅔in. long, the central one more robust, straight and porrect, puberulent, or often wanting. Upper Missouri, &c., 1818. SYN. *M. Nuttallii*. This will probably prove hardy.

M. m. cæspitosa (tufted).* A beautiful variety with brownish-yellow flowers.

M. mutabilis (changeable). *fl.* purple. July. Stem depressed-globose, umbilicate at apex; tubercles unequally four-sided, at first of a pleasing green, at length orange; axils at first naked, afterwards woolly and hairy; spines numerous, very changeable in colour, the outer ones erect, the central one very long, flexuous, blackish at apex. Mexico. SYNS. *M. autumnalis*, *M. cirrhifera*.

M. m. longispina (long-spined). This variety is very distinct, bearing long, ivory-white twisted spines.

Mammillaria—*continued.*

M. Nickelsæ (Nickelsi's). *fl.* having a red tube, 2in. or more across. Stems cæspitose from the upper part of the groove; tubercles ¼in. long, ovate-oblong; radial spines fourteen to eighteen, the upper ones fascicled and much longer than the lower ones. Mexico. This probably is the same plant offered by dealers as *M. Nicholsoni*. SYN. *M. Nickelsii*, of gardens.

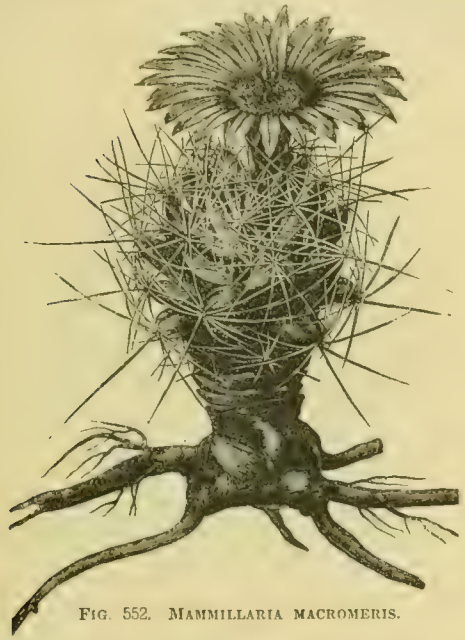

FIG. 552. MAMMILLARIA MACROMERIS.

M. Nickelsii. A synonym of *M. Nickelsæ*.

M. nivea (snowy). A form of *M. bicolor*.

M. Nuttallii (Nuttall's). A synonym of *M. missouriensis*.

M. Ottonis (Otto's).* *fl.* white, large for the size of the plant. May and June. Stem small, compressed, 3in. across, with numerous compressed tubercles, and short, hair-like spines. Mexico, 1834. See Fig. 553. There is another species called *M. Ottonis*, having a large, spiny stem.

FIG. 553. MAMMILLARIA OTTONIS.

M. Peacocki. The correct name is *M. dealbata*.

M. Pfeifferi (Pfeiffer's).* Stems having the spines subulate, fawn-coloured at first, but afterwards bright golden. This plant closely resembles *M. rhodantha*; in fact, it is now classed as a variety of that species. A beautiful Cactus.

M. phellosperma (corky-seeded). Stems simple, sometimes proliferous at the base, globose when young, afterwards almost cylindrical or pear-shaped, 5in. high, 2in. in diameter; tubercles ¼in. long, arranged in twelve spiral rows, slightly woolly in the axils; spines radiating in two rows, about fifty on each tubercle, the three or four central ones hooked at the tip or sometimes straight, and almost black, while the remainder are almost white. This plant has not been known to flower under cultivation.

M. Potosina (Potosin's). A garden synonym of *M. elegans*.

M. Purpusi (Purpus's). *fl.* red, small, disposed in a circle near the apex. Stem simple, rarely proliferous, cylindrical or cone-shaped, 4in. high; tubercles in twelve to twenty rows, each

Mammillaria—*continued.*

bearing a tuft of about twenty white radial spines, and six red central straight ones. Mountains of Colorado, 1894. Said to be one of the hardiest of Cacti.

FIG. 554. MAMMILLARIA RADIOSA.

M. radiosa (radiate). *fl.* violet. May and June. This is distinguished from *M. vivipara* by its ovate to cylindrical form, simple habit, more numerous (twelve to twenty) and longer radial spines, usually more numerous (three to fourteen) central spines of which the upper are more robust than the lower, and obtuse stigmas. Southern Texas, &c. See Fig. 554. SYN. *M. vivipara radiosa*.

M. r. Alversoni (A. H. Alverson's).* Fox-tail Cactus. This differs from *deserti* in its more robust and branching habit (*h.* 6in.), shorter and thicker tubercles, more numerous, stouter and longer black-tipped spines, and pink flowers. South-eastern California.

M. r. arizonica (Arizona).* *fl.* rose-coloured, 2in. to 2½in. across. Stem globose or ovate, 3in. to 4in. in diameter; tubercles about 1in. long, cylindrical, ascending, deeply grooved, with numerous straight, rigid spines, the fifteen to twenty outer ones whitish, the three to six inner ones deep brown and stouter. Northern Arizona.

M. r. chlorantha (yellow-flowered). *fl.* yellowish or greenish-yellow, 1½in. to 2in. long and broad. Stem ovate to cylindrical, sometimes 8in. to 9in. high, with twenty to twenty-five grey radial spines almost in two series, and six to nine stouter reddish or brown-tipped centrals. Southern Utah, 1883.

M. r. deserti (desert-loving). *fl.* straw-coloured, becoming purplish-tipped, smaller than in *M. r. arizonica*. Stem sub-globose or ovate, simple, with deeply-grooved tubercles, densely covered with stout, grey, interlocking spines. California, &c.

M. r. neo-mexicana (New Mexican). Stem generally shorter than in the type, sub-globose to sub-cylindrical, branching at base or simple, with more numerous radial spines, and more numerous blackish-purple central ones. Southern Utah, &c.

M. rhodantha (rose-flowered). The correct name of *M. atrata*. SYN. *M. fulvispina*.

M. robustispina (stout-spined). *fl.* saffron-yellow, 1½in. to 2in. long, with a very slender tube. July. *fr.* green. Stems large and stout, simple or tufted; tubercles sub-terete, 1in. long; radial spines twelve to fifteen, stout and rigid, ¾in. to 1½in. long, the lower ones stouter, more dusky, straight or curved downwards, the upper ones straight and fascicled, the central one stout, curved downwards, all horny and black-tipped. Sonora. SYN. *M. Brownii*.

M. Rungei (Runge's). A synonym of *M. lasiacantha*.

M. Scheerii (Scheer's). *fl.* terminal, erect, with several whorls of spreading, recurved petals, the lower ones tinged crimson, the upper ones pale yellow, forming a shallow cup 2in. across. Stem 7in. high and 5in. in diameter at base; tubercles large, swollen, somewhat flattened, the apices crowned with about a dozen brown spines. Mexico.

Mammillaria—*continued.*

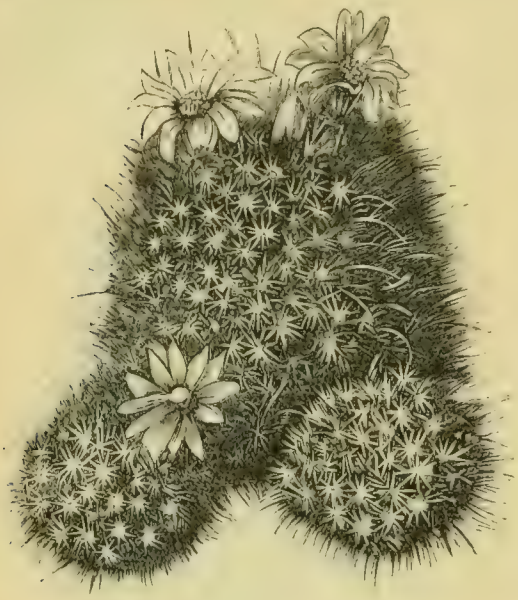

FIG. 555. MAMMILLARIA SCHELHASII.

M. Schelhasii (Schelhas'). *fl.* white, with a line of rose down each petal, ⅔in. across. Early summer. Stem producing offsets freely at the base, which grow into full-sized stems, and develop young ones till a compact cushion is formed; tubercles closely arranged, cylindrical, shining green, with fifteen to twenty radial, white, hair-like spines ¼in. long, and three inner, thicker ones, usually only one being hooked. Mexico. See Fig. 555.

M. Schmidtii (Schmidt's). A synonym of *M. centricirrha.*

FIG. 556. MAMMILLARIA SEMPERVIVI.

M. Sempervivi (ever-living). *fl.* inconspicuous and scantily developed near the outside of the top of the stem. Stem pear-shaped, 3in. wide, the top slightly depressed; tubercles conical, ¼in. long, their bases set in a cushion of white wool, their tips bearing tiny tufts of wool, and four small spines, which fall away on the tubercles becoming ripe, leaving two short, diverging, central spines. Near Zimapan, Mexico (at an elevation of 5000ft.). See Fig. 556. *M. Caput-Medusæ* is a form of this species.

Mammillaria—*continued.*

M. Spaethiana (Spaeth's). This closely resembles *M. Purpusi*; the chief difference is in the shape of the stem, which is depressed-globose rather than conical. Mountains of Colorado, 1894.

M. sphacelata (dark, withered). *fl.* rather small; sepals reddish-brown; petals blood-red. May. Stem 8in. high, cylindrical, becoming proliferous; tubercles almost conical, rhomboid at base, the axils nearly naked; radial spines fourteen to eighteen, ivory-white, red at apex, and becoming blackish and sphacelate, the central three or four erect. Mexico.

M. strobiliformis (strobiliform), of Scheer. A synonym of *M. tuberculosa.*

FIG. 557. MAMMILLARIA SUB-POLYHEDRA.

M. sub-polyhedra (often many-sided).* *fl.* arranged in a zone on the tops of the old stems; sepals greenish-yellow; petals bright red. May. *fr.* scarlet, 1in. long, pear-shaped. Stem simple (till it becomes old, when it develops offsets at the base), broadly cylindrical, 8in. high, 5in. in diameter; tubercles four-sided at base, prism-shaped, bearing pads of white wool in the corners at the base, and crowned with tufts of four to seven spines, usually all radial, sometimes one central. South Mexico. See Fig. 557. A beautiful species. It requires plenty of light. A moist atmosphere is fatal to success.

FIG. 558. MAMMILLARIA SULCOLANATA.

M. sulcolanata (woolly-grooved). *fl.* bright yellow, Poppy-scented, nearly 2in. across, the spread of the petals suggesting Paris Daisies. June to August. *fr.* glaucous-green, egg-shaped. Stem simple when young, proliferous at sides when old, the young plants developing from the apices of the

Mammillaria—*continued.*

tubercles, not in the axils, as is usual; tubercles nut-shaped, large, the bases surrounded by white wool, the points bearing eight to ten rigid, brown spines, all radiating from a little pad of wool. South Mexico, 1836. See Fig. 558.

M. texana (Texan). A form of *M. pusilla.*

M. tuberculosa (tubercled).* *fl.* pale purple, about five borne at the top of the stem, 1in. long and wide, Daisy-like. May and June. *fr.* red, oval. Stem 6in. high, 2in. thick, conical, surrounded at base with globose branches or offsets; tubercles in numerous spiral rows, ½in. long, rather narrow, pointed, with a crown of radial spines and three or four central ones. Mexico. A very pretty and distinct plant. SYN. *M. strobiliformis* (of Scheer).

M. uncinata (hooked). *fl.* purple, with a deeper tint running down the centre of the petals, 1in. long and wide, erect. May and June. Stem globose, about 4in. in diameter; tubercles closely pressed against each other at base, four-angled, ½in. long; spines four arranged crosswise and a central yellow one. Mexico, 1846. Half-hardy.

M. vetula (oldish). *fl.* yellow, ⅔in. long, just peeping above the tubercles; stigma white. May and June. Stem 3in. high, 1½in. thick; tubercles having a radial crown of hair-like yellow spines ½in. long, and a central red one ½in. long. Mexico, 1835.

M. villifera (hair-bearing). *fl.* pale rose, with a line of purple down the middle of each petal, borne near the top of the stem. May. Stem like that of *M. vetula*, but usually proliferous at base; tubercles angular, short, woolly in the axils, and bearing four rigid, short, reddish-brown spines at apex. Mexico.

M. viridis (green). *fl.* pale yellow, erect, 1in. long, borne at the top of the stem. May and June. Stem 4in. high, 3in. in diameter, proliferous at base; tubercles short, four-angled, crowded in spiral rows, woolly at base, with five or six radiating spines and a central erect one at apex, none of them more than ½in. long. Mexico, 1850. Half-hardy.

M. vivipara (stem-sprouting). *fl.* at the apex of the stem, 1½in. long and broad; petals about thirty, bright purple, fimbriated. May and June. *fr.* pale green, ½in. long. Stems produced in profusion, sometimes forming a cluster 3ft. in diameter; tubercles small, hidden by the spines; spines radial, about twenty to each tubercle, white, hair-like, stiff, about ½in. long, the central four or six a little longer than the others. Louisiana.

M. v. radiosa (radiate). A synonym of *M. radiosa.*

M. Wrightii (Wright's).* *fl.* bright purple, 1in. long. *fr.* purple, somewhat globose, 1in. long. Stem globose or depressed-globose, 1½in. to 3in. in diameter, simple; tubercles ½in. long, with naked axils; radial spines eight to twelve, white (upper ones dusky-tipped), pubescent, ½in. to ¾in. long, the central ones usually two, rarely one or three, reddish-black, hooked. Mexico, Texas, &c.

M. Zuccariniana (Zuccarini's).* *fl.* bright purple, 1in. long and wide, borne at the top of the stem. May and June. *fr.* purple, egg-shaped, 1in. long. Stem 3in. high, rounded above, narrowed and pegtop-like at base, the top flattened and about 3in. across; tubercles conical, ½in. long, with a tuft of six to eight white, hair-like spines, and two central hooked ones. Mexico, 1878. A charming little plant.

MANABEA. A synonym of **Ægiphila** (which *see*).

MANDIROLA. Included under **Achimenes** (which *see*).

MANDRAGORA. *M. officinarum* (SYN. *M. officinalis*) is the correct name of *M. vernalis.*

MANETTI. A Rose Stock introduced from Italy by the late Mr. Rivers. It is a very vigorous Stock, and therefore not so well suited to the Teas as the **Seedling Briar** (which *see*). It is largely employed as a Stock for dwarf Roses, and is especially suited to soils which are hot and gravelly, and on which Briars refuse to flourish.

MANETTIA. *M. luteo-rubra* is the correct name of *M. bicolor*, and *M. micans* is properly called *M. cordifolia.*

MANGOLD FLY. *See* **Beet or Mangold Fly.**

MANIHOT. To the species described on p. 323, Vol. II., the following should be added:

M. Aipi is a variety of *M. palmata.*

M. carthaginensis (Carthagena). *fl.*, racemes sub-sessile, many-flowered, simple or paniculate-branched. July. *l.* 3in. to 5in. long and nearly as much in breadth, deeply five- to seven-parted, membranous, of a fresh green above, rather glaucous beneath; segments lanceolate, spathulate, or obovate. Venezuela, &c., 1826. Greenhouse or half-hardy tree, of slender habit. SYNS. *Janipha Loeflingii*, *Jatropha carthaginensis.*

M. diversifolia (variable-leaved). The correct name of *Jatropha integerrima.*

MANITIA. A synonym of **Globba** (which *see*).

MANLILIA. A synonym of **Polyxena** (which *see*).

MANNA GUM. *See* **Eucalyptus viminalis.**

MAN OF THE EARTH. A popular name for *Ipomœa pandurata.*

MANULEA. Several species formerly included hereunder are now referred to **Chænostoma, Lyperia,** and **Sphenandra.**

MAPA. A synonym of **Petiveria** (which *see*).

MAPANIA (a native name). SYN. *Lepironia* (in part). Including *Pandanophyllum.* ORD. *Cyperaceæ.* A genus embracing about thirty-three species of stove, perennial, sometimes very tall herbs, dispersed over the tropics. Spikelet many-flowered, borne on the stem or terminating a leafless scape, solitary or few in a sessile head, or rarely numerous and corymbosely paniculate. Leaves fascicled at the base of the stem or on the rhizome, long and rather broad, or ovate-lanceolate, on long petioles. Two species have been introduced. For culture, *see* **Cyperus.**

M. humilis (dwarf). *fl.*, spikelet castaneous, solitary, trigonal-ovoid, ½in. to ⅔in. long; scape dark purple, leafless, 2in. to 3in. long. *l.* trifarious, 6in. to 10in. long, 1¼in. to 1⅔in. broad, three-nerved, narrow-oblong, rounded-cuneate at base, with a cusp 1½in. long at apex; petioles 4in. to 9in. long, channelled, complicate-sheathing at base. Borneo, 1835. SYNS. *M. lucida* (I. H. 1885, t. 557), *M. Wendlandi*, and *Pandanophyllum Wendlandi.*

M. lucida (clear). A synonym of *M. humilis.*

M. pandanifolia (Pandanus-leaved). *l.* long, narrow, stiffish, arching, green, 2ft. long, 1½in. wide. *h.* about 4ft. Habitat not recorded, 1897. By some botanists it is thought that this species belongs elsewhere.

M. Wendlandi (Wendland's). A synonym of *M. humilis.*

MAPLE BLOTCH (*Rhytisma acerinum*). *See* **Acer—Insects and Diseases.**

MARANHAO NUT. *See* **Bertholletia.**

FIG. 559. MARANTA ARUNDINACEA VARIEGATA.

MARANTA. To the species and varieties described on pp. 326-7, Vol. II., the following should be added. Several plants formerly included under *Maranta* are now referred to **Calathea, Myrosma,** and **Stromanthe.**

Maranta—*continued.*

M. angustifolia. The correct name is *Stromanthe Tonckat.*

M. argentea (silvery). *l.* large, oblong, acute, silvery-grey, marked with narrow, curving lines of a deep green. Brazil, 1884.

M. arundinacea variegata (variegated).* *l.* 5in. to 7in. long, 1½in. to 3in. broad, oblong, sub-acuminate at apex, rounded-obtuse at base, beautifully and irregularly variegated in dark and light greens and greenish-yellow; petioles 6in. to 7in. long, striped with green and white. Singapore, 1886. See Fig. 559, for which we are indebted to Messrs. James Veitch and Sons. SYN. *Phrynium variegatum* (I. H. 1886, 601).

M. asymmetrica (unsymmetrical). *l.* having the blade much wider on one side of the midrib than on the other. 1882.

M. Chantrieri (Chantrier's).* *l.* ovate-cordate, acute, 1ft. to 1½ft. long, wavy, greyish-green, traversed by oval-oblong, acute bands of deep green and thread-like lines of the same colour; petioles 4in. to 8in. long. Brazil, 1897. A handsome species.

M. chimboracensis. The correct name is *Calathea chimboracensis.*

M. concinna is synonymous with *Calathea leopardina.*

M. conspicua (conspicuous). *l.* oblong-ovate, dark green above, pinnately marked with broken, distant bands of pale yellow-green, purplish beneath. Brazil, 1885. A small species.

M. fascinator (bewitching).* *l.* distichous, truncate at base, slightly acuminate at apex; ground-colour of the upper surface dark green, silvery towards the centre, pale green towards the edges, the nerves of a fine red; under-surface purple. Brazil, 1894. A dwarf species. (I. H. 1894, p. 105, t. 7.)

FIG. 560. MARANTA MAJOR.

M. gratiosa (favoured).* *l.* broadly oblong, sub-cordate, silvery-grey, the midrib and five or six tapering, curved bands on each side of it of a bright green. Brazil, 1884.

M. iconifera (picture-bearing). *l.* about 6in. long, obliquely ovate, yellowish-green, marked with oblong, deep green blotches. Brazil, 1887.

Maranta—*continued.*

M. Kerchoveana (Kerchove's) A synonym of *M. leuconeura.*

M. Koërnickiana (Koërnick's). *fl.* whitish; bracts coloured, broader than long, obtuse; spike ovate-cylindrical. *l.* green, 4in. to 8in. long, elliptic, acute or shortly acuminate, highly glabrous, shining above, the margins undulated; petioles long, sheathing at base. Brazil, 1874. (R. G. 1874, t. 784.)

M. Leonæ (Mme. Leon's). *l.* ovate, 6in. long, borne on petioles of about the same length; both covered with soft, silky hair and variegated with green and grey. 1893. Plant dwarf.

M. leptostachya (slender-spiked). *l.* obliquely elliptic-oblong, acute, bright green, pinnately banded with greenish-white. Brazil, 1884. SYN. *M. speciosa.*

M. leuconeura (white-nerved). *l.* cordate-oblong, obtuse or very shortly acuminate, green on the upper surface, purplish beneath, the midrib light green. *h.* 6in. to 8in. Brazil, 1875. (F. d. S. 2364-5.) SYNS. *M. Kerchoveana, M. Kerchovei* (of gardens), and *Calathea Kerchoveana.*

M. major (greater).* *l.* green, ovate, borne on long, erect petioles. *h.* 3ft. A splendid plant for dwelling-house or conservatory adornment, so long as it is never placed where the sun's rays fall directly upon it, has a nice loamy soil, and plenty of water during the growing season. See Fig. 560. SYN. *Ischnosiphon leucophæus.*

M. Massangeana (Massange's). Of this plant, which is already very fully described in Vol. I. as *Calathea Massangeana* (B. H. 1875, p. 178, t. 10; F. M. n. s., t. 234), there are several colour-varieties.

M. minor (lesser). *l.* shortly elliptic, sub-cordate at base, shortly and obliquely mucronate at apex, emerald-green, with six distant blotches of deep reddish-brown. Brazil, 1897. A small-growing species.

M. musaica (mosaic). *l.* obliquely cordate, 7in. long, 3½in. broad, bright, glossy green, marked with numerous close-set, transverse veins. Brazil, 1884.

M. nitida (shining). *l.* oblong, acute, 6in. long, 3in. broad, pale, bright, shining green, with four or five oblong, green patches on each side of the midrib. Brazil, 1884.

M. picta (painted). A synonym of *Calathea picta.*

M. polita (neat). *l.* 4in. to 5in. long, 2in. broad, glossy green, elegantly marked with stipitate, oblong, dark green blotches. Brazil, 1884.

M. Porteana is synonymous with *Stromanthe Porteana.*

M. Sanderiana (Sander's). This is described as an ornamental foliage plant in the way of *Calathea ornata roseo-lineata,* but with much larger leaves. 1892.

M. smaragdina. The correct name is *Calathea smaragdina.*

M. speciosa (showy). A synonym of *M. leptostachya.*

M. splendida (splendid). By some authorities this is regarded as a Calathea, and it is described as such in Vol. I.

M. undulata (of gardens), frequently thus catalogued, is a synonym of *Calathea undulata.*

MARANTHES. A synonym of **Parinarium** (which *see*).

MARATTIA. Including *Stibasia.* Marattias are highly ornamental, robust-growing Ferns, and although they do not form trunks, generally attain very large dimensions. Their stately fronds are produced from very thick, fleshy crowns. A peculiarity of this genus is that it produces most of the edible Ferns known in cultivation. In New Zealand, the West Indies, Brazil, and Mexico, the succulent crowns of the various indigenous species are used by the natives as articles of food, either boiled, roasted, or baked. Though Marattias thrive luxuriantly if given a good amount of heat, *M. fraxinea elegans* will stand in a cold Fernery for several consecutive years, and indeed make very good progress during the summer months, although resting in the winter; but it is, we believe, the only Marattia which will succeed under cold treatment.

Marattias possess an immense advantage over most, if not all, other gigantic-growing Ferns, inasmuch as, if they are accidentally allowed to get dry at the roots, the fronds and their divisions, being jointed and of a fleshy nature, hang down and become quite flabby—a state in which they have the faculty of remaining a comparatively long time without sustaining any serious damage. It is, however, advisable, when plants in that condition are detected, to give water at the roots at once, when the fronds will speedily regain their former stiffness without showing a trace of having suffered from the mishap.

The *Marattiaceæ* are seldom propagated by means of spores, although these are abundantly produced, for they are said to germinate with difficulty; our own experience points that way, as we have only once succeeded in getting some to germinate, notwithstanding

Marattia—*continued.*

that they have been sown in all possible states and under various conditions. Marattias are usually and readily increased by laying the basal scales of the fronds on a bed of constantly moist material, such as sphagnum, where they will be found to emit roots freely, and to produce on each side of the scales little bulbous growths, which later develop into plants.

FIG. 561. PORTION OF PINNULE OF MARATTIA ALATA.

Of all the Marattias in cultivation, *M. Cooperi* is perhaps the one most subject to the ravages of Thrips and Scale; but it may easily be kept clean, as it will endure fumigation without suffering in the least.

To the species described on p. 327, Vol. II., the following should be added:

M. ascensionis (Ascension Island). A synonym of *M. fraxinea purpurascens.*

M. attenuata. Of this species there is a variety *Moorei.*

M. Burkei (Burke's). *rhiz.* stout, prickly, green, more than 1ft. in length. *fronds* square, tripinnate, above 1ft. long and broad, bright green; pinnæ arranged in four opposite pairs; pinnules crowded, lanceolate, 1½in. long, crenate. Colombia, 1897. Stove. Allied to *M. alata* (see Fig. 561). (G. C. 1897, xxii., p. 425, *f.* 129.)

M. Cooperi (Cooper's). A synonym of *M. attenuata.*

M. cristata (crested). A synonym of *M. fraxinea purpurascens.*

FIG. 562. PORTION OF PINNA OF MARATTIA FRAXINEA.

M. fraxinea. A portion of a pinna of this noble species, native of South Africa, Polynesia, India, New Zealand, &c., is shown in Fig. 562. SYN. *M. sorbifolia.*

M. Moorei (Moore's). A form of *M. attenuata.*

Marattia—*continued.*

M. purpurascens (purplish). A variety of *M. fraxinea.*

M. salicifolia (Willow-leaved). A variety of *M. fraxinea.*

M. sorbifolia (Sorbus-leaved). A synonym of *M. fraxinea.*

M. Verschaffeltiana (Verschaffelt's). A synonym of *M. cicutæfolia.*

MARCGRAVIA INDICA. The plant catalogued by nurserymen under this name is probably a Pothos; while *M. paradoxa* is *Monstera acuminata.*

MARCH MOTH (*Anisopteryx æscularia*). A common Moth, whose larvæ are destructive to orchard trees—Plums and Apples—as well as to many landscape trees, Oak, Elm, &c. It is a near relative of the very objectionable Winter Moth (*Cheimatobia brumata*), with which it is sometimes found feeding. The male has ample wings, but the female is wingless and has a large anal tuft (Fig. 563, 3). Flying as it does in the dusk of evening, the male Moth is not often noticed, but it may commonly be found at rest upon oak fences, &c., in the neighbourhood of its food-plant, though so well does its general colour harmonise with the environment, that the insect would readily escape the unpractised eye. Popularly, the Moth is associated with the month of March, but it may be found

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FIG. 563. MARCH MOTH (*Anisopteryx æscularia*), showing (1) Male Moth; (2) Caterpillar; (3) Wingless Female; and (4) Twig with Eggs.

much earlier. The general colour of the fore-wings of the male is brown or brownish-ochreous, traversed by paler wavy lines which are whitish internally; the hind-wings are lighter. In stretch of wings the insect is over 1in. The female is brownish and of the form shown in the illustration. She deposits her eggs in a series of rings in the vicinity of the buds (as shown), and then covers them with hairs from her anal tuft. On emergence the caterpillars feed upon the unexpanded buds, and soon commence to grow. When mature they are over 1in. long, and are yellowish-green, with a darker dorsal line, edged with yellow, while the subdorsal, lateral, and subspiracular lines are yellowish. They are provided with rudimentary fore-legs on segment nine. The pupal state is passed in a silken cocoon just beneath the surface of the soil.

By way of prevention, grease-banding, as in the case of the Winter Moth, has been found of great assistance in lessening attacks. Where, however, despite every precaution, females pass the bands, deposit their eggs, and caterpillars are hatched out, there is nothing better than spraying with Paris Green as soon as practicable, using 1oz. of the arsenite to 24 gallons of water.

MARGINATE. Having a defined margin different in texture or colour from the remainder of the organ.

MARGUERITE, or **PARIS DAISY.** *See* **Chrysanthemum frutescens.**

MARIALVA. A synonym of **Tovomita** (which *see*).

MARIANTHUS. Including *Calopetalon.* To the species described on p. 328, Vol. II., the following should be added:

M. ringens (gaping). *fl.* red, in dense, terminal corymbs, shortly pedunculate; petals very oblique, ⅜in. to 1in. long. November. *l.* varying from broadly lanceolate to linear, acuminate, 2in. to 3in. long, narrowed to the petioles; young ones sometimes silky-hairy SYN. *Calopetalon ringens* (B. M. 5233).

MARICA. This genus embraces about eleven species, confined to tropical America. Stamens short, erect; filaments distinct; peduncle flat and leaf-like, with one or few sub-sessile or pedunculate flower-clusters. To the species, &c., described on p. 328, Vol. II., the following should be added:

M. californica (Californian). A synonym of *Sisyrinchium californicum.*

M. longifolia. *fl.* yellow, barred and banded with brown, 2in. across; peduncle narrowly winged, 1ft. to 2ft. long, bearing three long-stalked clusters just below the tip. *l.* green, ensiform, 1in. broad. Rio Janeiro, 1823. SYN. *Cypella longifolia.*

M. Northiana splendens (splendid).* A variety having flowers more brightly coloured than in the type. Brazil, 1895. (I. H. 1895, 40.)

M. occidentalis (Western). *fl.* three in a cluster; outer perianth segments white, spreading, 1in. long; inner ones ½in. long, the concave base mottled with brown and the ovate tip with violet. July. *l.* five in an erect, fan-shaped cluster, ensiform, the central ones 1ft. long. Stem erect, more than 1ft. long, broadly winged. Peru, 1832.

M. plicata (folded). A synonym of *Eleutherine plicata.*

M. striata (striped). A synonym of *Sisyrinchium striatum.*

M. vaginata (sheathed). A synonym of *M. Northiana.*

MARICA (of Schreber). A synonym of **Cipura** (which *see*).

MARISCUS (a name applied by Pliny to a kind of Rush; perhaps from the Celtic *mar*, a marsh, in allusion to the habitat). ORD. *Cyperaceæ.* A large genus (160 species) of Rush or Grass-like herbs, of variable habit, inhabiting warm regions, closely allied to *Cyperus.* Glumes persistent, the lowest two empty. For culture, *see* **Cyperus.**

M. ferax (fertile) is described as a tall-growing, Brazilian species, with very large inflorescences. 1895. SYNS. *Cyperus distans, C. ferox.*

M. umbilensis. *fl.*, spikes ¼in. to 1in. long, cylindric, of many spikelets; bracts four to eight, as much as 1ft. to 2ft. long; umbel compound, 5in. to 9in. in diameter. *l.* 1½ft. to 2ft. long, ¼in. to ½in. broad. Stem 2ft. to 3ft. long, triquetrous at top. South Africa, 1891. SYNS. *Cyperus natalensis* (of gardens), *C. umbilensis.*

MARL. A form of carbonate of lime employed to improve the character of light, porous soils, and make them retentive of manure and moisture. *See* **Manures,** Vol. II.

MARMALADE PLUM. *See* **Lucuma mammosa.**

MARQUISIA. A synonym of **Coprosma** (which *see*).

MARREM GRASS. *See* **Psamma.**

MARRUBIASTRUM. A synonym of **Sideritis** (which *see*).

MARSH BEETLE. *See* **Typha latifolia.**

MARSH FLEABANE. *See* **Pluchea.**

MARSH SAMPHIRE. *See* **Salicornia.**

MARSH VALERIAN. *See* **Valeriana dioica.**

MARSILEA. To the species described on p. 330, Vol. II., the following should be added:

M. quadrifolia (four-leaved). *petiole* 3in. to 6in. long; leaflets deltoid, glabrous, ¼in. to ½in. long, the outer edge rounded and entire. *pedicels* bi- or quaternate, ¼in. to 1in. long, erect, connate with each other, and adnate to the base of the petiole and upper part of the base of the conceptacle. *conceptacles* roundish-oblong, ¼in. to ½in. long. *sori* sixteen to twenty. Central Europe, &c. A hardy, wide-creeping aquatic.

M. salvatrix (saviour). A form of *M. Drummondii*, the difference being purely botanical.

MARTAGON. Included under **Lilium** (which *see*).

MARTENSIA. A synonym of **Alpinia** (which *see*).

MARTINEZIA. To the species described on pp. 330-1, Vol. II., the following should be added:

M. Aiphanes (Aiphanes). *fl.* white, on a simply-branched spadix, 1½ft. long. *fr.* red; nut hard, black. *l.* 5ft. long; pinnæ four pairs, opposite, cuneiform, præmorse at apex, whitish-pubescent beneath, petioles prickly. Stem 30ft. high, 6in. in diameter. Caracas. SYN. *Aiphanes aculeata.*

M. corallina and *M. leucophæa* have also been introduced.

MARTRASIA. A synonym of **Jungia** (which *see*).

MARTYNIA. *M. Craniolaria* is correctly *Craniolaria annua.*

MARUMIA (of Reinwardt). A synonym of **Saurauja** (which *see*).

MASDEVALLIA. *M. Dayana, M. gracilenta,* and *M. hypodiscus* are now referred to **Cryptophoranthus**; and *M. anchorifera, M. brevis, M. gibberosa, M. pulvinaris, M. punctata,* and *M. swertiæfolia* are classed under **Scaphosepalum.**

Masdevallias are not difficult to grow; in fact there are, perhaps, no Orchids more amenable to cultivation than the large and showy-flowered section of this species, to which belong *M. coccinea* (*M. Harryana*), *M. Veitchii, M. militaris* (*ignea*), and other of the species and hybrids of this class. They require a cool, moist house in summer, with a temperature of from 45deg. to 50deg. in winter. Lower conditions than these may be allowed in cold weather, but with these the moisture in the atmosphere must be reduced and the plants kept drier at the roots. In the dull winter months, with a normal temperature, the moisture must be applied with considerable discretion. The climatic conditions outside being so changeable, cause considerable fluctuations inside the cool divisions of our houses. Sudden falls in the temperature when the plants are wet at the roots often induce spotting of the leaves, giving them that unsightly appearance so common in the foliage of the large-flowered section of Masdevallias. There are certainly no Orchids worthier of the attention of the amateur than this section of the genus, all the species of which are best grown in pots.

FIG 564. MASDEVALLIA CHIMÆRA WALLISII.

The *Chimæra* (see Fig. 534), or small-flowered botanical section, need a warmer treatment during the winter season, and the temperature should not be allowed to drop below 50deg. They are best accommodated in baskets, and the small-growing section in pans, so that they may be suspended near the roof-glass. They do well with the other section during the summer months of the year, and should not be allowed to suffer from lack of moisture at the root at any time.

M. Wendlandii is a tropical species, thriving best in a warm intermediate house temperature at all seasons of the year. The potting of the large-flowered section is best done in the months of August and September. The other sections should have attention in the early spring,

Masdevallia—*continued.*

the compost in each case consisting of good fibrous peat and living sphagnum, with a free sprinkling of coarse sand and finely-broken crocks or charcoal, to assist in retaining a porous condition of the compost. The drainage should be clean and ample.

To the species, varieties, and hybrids described on pp. 332-5, Vol. II., the following should be added:

M. acrochordonia (belted above). *fl.* much as in *M. ephippium*, six to fifteen to a peduncle; sepals having numerous warts on the upper surface; petals acuminate; lip much narrower than in *M. ephippium*, with an undulated, median keel on the upper part, and an acuminate top. Ecuador, 1835.

M. amabilis linco-striata (striated). *fl.* having the sepals streaked with lines of purple on an orange-yellow ground. May. Peru, 1875. (I. H. ser. iii., t. 196.)

M. angulata (angled). This species is allied to *M. Moorcana*, from which it differs in having shorter scapes and perianth, the free parts of the sepals much less attenuated, and longer leaves. Ecuador, 1898.

M. astuta (cunning). A synonym of *M. erythrochæte*.

M. aviceps (bird's-head). The correct name of *Pleurothallis aviceps*.

M. Backhouseana is a form of *M. Chimæra*.

M. Benedicti (Benedict's). A synonym of *M. Houtteana*.

M. biflora (two-flowered). A synonym of *M. pachyura*.

M. Bonplandi (Bonpland's). *fl.* larger than in *M. coriacea* (to which this species is allied); sepals oblong-ligulate, acute, two-keeled; lip oblong, very slightly trilobulate. *l.* narrow-spathulate, less than half as long as the peduncle. Habitat not recorded.

M. Bruckmülleri (Bruckmüller's). A synonym of *M. coriacea*.

M. Burbidgeana (Burbidge's). *fl.* having the tube less than ¼in. across; sepals greenish-yellow, 1in. long, with brown spots and yellow hairs; lip yellowish. *l.* tufted, 5in. long. Colombia, 1893.

M. caloptera (beautiful-winged). *fl.* white, larger than those of *M. melanopus*, with crimson streaks, longitudinal stripes on the sepals—two on the upper and three on each lateral one; sepals cohering for ¼in., forming a narrow tube, gibbous below; lip yellow, with crimson lines and spots. *l.* 3in. long, oblong-ovate. Northern Peru, 1874.

M. calyptrata (hooded). *fl.* of a beautiful orange-yellow; dorsal sepal very short; tails filiform, 1½in. to 2in. long; lip rounded, obtuse at apex. Habitat not recorded.

M. candida (white). A synonym of *M. tovarensis*.

M. Carderi (Carder's).* *fl.* remarkably fleshy and soft; tails yellow, spotted blackish-purple, long; perianth short, cup-shaped, whitish inside, ochre-orange at base, bearing a blackish-mauve-purple zone between the two areas, the free, triangular portions short, the inside covered with rusty hairs. *l.* spathulate-lanceolate, 3in. to 5in. long. Colombia, 1883. (B. M. 7125; G. C. n. s., xx., p. 181, f. 30.) A pretty species.

M. caudata (tailed).* The correct name of *M. Shuttleworthii*. See Fig. 565.

M. Chimæra. The following (described as species in Vol. II.) are now regarded as forms of this: *M. Backhouseana*, *M. Roezlii*, *M. spectrum*, and *M. Wallisii*.

M. C. aurea (golden). A golden-yellow variety of the type.

M. C. Gorgona (Gorgon). *fl.* canary-yellow, densely spotted with reddish-purple; lip tinged with pale orange-red.

M. C. senilis (senile). *fl.* reddish-brown, covered inside with short, yellow hairs, comparatively small; petals white, with mauve-brown spots; lip pale purple and white. 1885.

M. coccinea Harryana. Besides the varieties included under *M. Lindeni* in Vol. II., the following are noteworthy: *arminiaca*, *cærulescens*, COMET, CRIMSON KING, *lilacina rugosa*, *rosea-violacea*, *rotundiflora*, *sanguinea*, THOMPSON'S SCARLET, and *versicolor*.

M. Colibri (humming-bird). A synonym of *M. ephippium*.

M. conchiflora (shell-flowered).* A fine variety of *M. coccinea*, having shell-like flowers of a rosy-lake shade.

M. costaricensis (Costa Rica).* This does not appear to differ materially from *M. Lauchcana*.

M. Crossii (Cross's). A synonym of *M. racemosa*.

M. Culex (Culex). A synonym of *Pleurothallis macroblepharis*.

M. cupularis (cup-like). *fl.* about 2in. long; the cup-like part clear brown strongly spotted with very dark brown, dark brown inside; sepals and lip ochre-yellow, the latter with three brown lines and a number of spots on the lateral lobes. *l.* small, oblong, obtuse. Costa Rica, 1893.

M. demissa (depressed). *fl.*, free lacinia of the upper sepal triangular and very short, the tail dark yellow, the lateral sepals brownish-purple, connate, rounded outside, with two

Masdevallia—*continued.*

strong, yellow tails; petals brown, small; lip brown, narrow, cordate-triangular, acute; column white; peduncle one-flowered, much shorter than the leaf. *l.* very thick, cuneate-spathulate. Costa Rica, 1887.

M. Denisoniana is a form of *M. coccinea*.

M. deorsa (downwards). *fl.* light buff-yellow, much blotched with purple-brown, especially at the back and towards the base of the lateral sepals; petals light greenish-yellow, lip papillose in front, deep purple, mottled with yellow behind; dorsal sepal ¾in. long, the lateral sepals about twice as long, each terminating in a long, rather slender tail. *l.* 10in. to 13in. long, coriaceous and rather narrow, and they invariably maintain their downward direction. It is an interesting plant, and its anomalous habit would suggest that it grows under somewhat peculiar conditions in a wild state. It belongs to the *coriacea* section, differing from the others in having a descending scape, and the lateral sepals are not united into a common limb, as in many of the larger-flowered species of the group. Colombia, 1894.

FIG. 565. MASDEVALLIA CAUDATA.

M. elephanticeps (elephant's-head). *fl.* solitary, horizontal, 3in. to 4in. long, somewhat resembling an elephant's head, the tubular portion of the perianth produced into a chin at the lower base, and, as well as the lower sepals, dark crimson-purple, pale purple outside, united for one-third their length, the tails yellow inside; upper sepal bright yellow, the three-cornered basal part gradually narrowing into the yellow tail; peduncles 1ft. high. *l.* tufted, cuneate-spathulate, acute. Colombia. (F. d. S. 997; R. X. O. i., t. 3.) The variety *pachysepala* (R. X. O., t. 74, f. 3-4) has the tails of the sepals broader.

M. ephippium. One of the most distinct Masdevallias. See Fig. 566. It is described in Vol. II.

M. fasciata (bundled). *fl.*, dorsal sepal oblong, hooded, with a filiform-tail; lateral ones narrower; lip pandurate, seated on a long production of the foot of the column. Colombia, 1881.

M. fenestrata (window-like). A synonym of *Cryptophoranthus atropurpureum*.

Masdevallia—*continued.*

M. flaveola (yellowish). *fl.* pale yellow, two or three on a slender peduncle. *l.* cuneate-spathulate. Costa Rica, 1884. A small species, somewhat resembling *M. attenuata.*

M. Forgetiana (Forget's). *fl.* small. *l.* comparatively narrow, light green. Northern Brazil, 1895.

M. fragrans (fragrant). *fl.* yellowish, cupped, with short, fleshy tails, in shape much resembling those of *M. pachyantha.* Colombia, 1893. This appears to be a yellow variety of *M. corniculata.*

M. fulvescens (fulvous).* *fl.* of a buff shade, passing into light purplish-brown on the constricted sides of the throat; upper sepal deeper orange-yellow, shading into purplish-brown on the two lateral nerves; tails 2in. long; lip and petals very small, white. Colombia, 1890. A very pretty species, allied to *M. infracta.* (G. C. 1890, viii., p. 325, f. 65.)

M. Galeottiana (Galeotti's). A synonym of *M. floribunda.*

M. Gaskelliana is synonymous with *M. erythrochæte.*

M. Gorgona (Gorgon). A variety of *M. Chimæra.*

M. guttulata (slightly striped). This species is closely related to *M. tovarensis,* but the flowers are only half as large and are yellowish-white spotted and slightly suffused with light purple. March. Ecuador (?), 1890. SYN. *M. Laurencei.*

FIG. 566. MASDEVALLIA EPHIPPIUM.

M. Huebschii. A misprint in an Orchid publication for *Maxillaria Huebschii.*

M. ignea Boddaërtii (Dr. Boddaërt's). *fl.* solitary, about 2½in. long, 2in. to 2¼in. broad, very flat, on tall peduncles; sepals yellow, gradually passing to bright crimson-scarlet mottled with yellow, the dorsal one filiform, the lateral ones ovate, not tailed. April and May. *l.* leathery, lanceolate-obovate. Colombia. (I. H. ser. iii. 357.)

M. i. Massangeana (Massange's). *fl.* bright orange-vermilion, flushed rosy-purple, large.

M. i. militaris (military). *fl.* not very freely produced, having the tube yellow and the limb cinnabar-red; lip broad and short. *l.* dark green, of considerable substance. Colombia, 1880.

M. Laucheana (Lauche's). *fl.* white, with yellow tails. *l.* spathulate. A pretty species.

M. Lawrencei (Sir Trevor Lawrence's). A synonym of *M. guttulata.*

M. Lindeni is a form of *M. coccinea.*

M. longicaudata is identical with *M. infracta.*

M. Lowii (Low's). This appears to be a synonym of *M. trinema.*

M. macrochila (large-lipped). *fl.* 1½in. across; sepals yellowish-green, spotted with black, ovate, the tips terminating in tails as long as the blades; lip orange-yellow, with darker orange veinings, broadly sub-panduriform. *l.* oblong-elliptic or oblong-lanceolate, 2in. to 4in. long. Colombia, 1890. Allied to *M. bella.* (R. G. 1891, t. 1344, f. 4-6.)

M. maculata flava (yellow). A small-flowered form, with the tails of a uniform tawny-yellow. 1889.

M. myriostigma is a synonym of *M. floribunda.*

Masdevallia—*continued.*

M. nidifica (nest-building). *fl.* white, veined and dotted with crimson; lobes yellow, having very long tails; peduncles one-flowered. Ecuador, 1880. A miniature species.

M. Normanii (Rev. Norman's). A synonym of *M. Reichenbachiana.*

M. Obrieniana (O'Brien's). A small species, closely allied to *M. simula,* but having larger, yellow flowers spotted with maroon. Habitat not recorded, 1890.

M. platyrachis (broad-rachised). A synonym of *Pleurothallis platyrachis.*

M. polyantha (many-flowered). A synonym of *M. Schlimii.*

M. psittacina is identical with *M. Houtteana* and *M. Benedicti.*

M. pumila (dwarf). *fl.*, cup cylindrical; petals ligulate, obtuse, semi-sagittate; tails linear; upper triangle short, minute, the lateral ones large, produced; lip panduriate-ligulate. *l.* linear-lanceolate, unequally bidentate at apex, 4in. long. Peru.

M. pusilla (dwarf). *fl.* yellowish, blotched with purplish-brown, small; scape 4in. long, flexuous. *l.* lanceolate, 6in. long. Colombia, 1893. Allied to *M. Troglodytes.*

M. Pusiola (rather dwarf). *fl.* light sulphur, small, deeply slit; free part of the sepals equal in length to that of their tails; petals bilobed at apex, one lobe being bent forwards; lip unguiculate, auricled on each side at the base, the anterior blade oblong-sagittate. *l.* tufted, lanceolate, 1in. long. Colombia, 1887. The smallest Masdevallia yet known.

M. racemosa (racemose).* *fl.* of a brilliant orange-red, shaded with crimson, sometimes paler, approaching yellow; upper sepal triangular, reflexed, the lateral ones connate in a tailless blade 1in. to 1½in. broad; petals and lip minute; scape 10in. to 15in. long, racemose. *l.* 2in. to 4in. long. Colombia, 1883. (G. C. 1884, xxi., p. 737.) SYN. *M. Crossii.*

M. Roezlii is a form of *M. Chimæra.*

M. Rolfeana (Rolfe's). *fl.* of a rich chocolate-brown, honey-coloured at the basal parts of the tube, 2½in. long; tails 2½in. long. *l.* thick, leathery, twice as long as the scape. Colombia, 1891. A remarkable species.

M. rufo-lutea (reddish-yellow). A synonym of *M. civilis.*

FIG. 567. MASDEVALLIA TRIARISTELLA.

M. Schrœderiana (Baron von Schrœder's).* *fl.* "of good size, the two lower divisions rather the larger, edged with deep purple and white in the centre"; tails yellow, very long, recurved. Origin not stated, 1890. (J. H. 1890, xxi., p. 557, f. 74.)

M. senilis (old). A form of *M. Chimæra.*

M. Shuttleworthii. The correct name is *M. caudata.*

Masdevallia—*continued.*

M. sororcula (little sister). *fl.* greenish outside; middle sepal pale, lined purple, the lateral ones purple, with greenish tails; petals white, with a purple mid-line, the purple side lobes and disk with a red mid-line and white adjacent areas; peduncle one-flowered. *l.* ligulate, acute, leathery. Habitat not recorded, 1887.

M. spectrum is a form of *M. Chimæra.*

M. striatella (slightly striated). *fl.* small; perianth white, striped cinnamon, going off into three short tails; petals with a brown mid-line, lanceolate, with an angle on the lower side; lip yellow at base and apex, and with three purple nerves, lanceolate, acute, angular at base. *l.* about 5in. long, rather thick, cuneate-oblong, blunt. Colombia, 1886.

M. triaristella (three-bristled). This very distinct species, fully described in Vol. II., is shown at Fig. 567.

M. trichæta is identical with *M. gemmata.*

M. tricolor (three-coloured). *fl.* purple, having the tails of the sepals short, the lateral sepals connate, and the lip nearly square. Colombia, 1882. Allied to *M. Estradæ.*

M. trinema (three-tailed). *fl.*, sepals almost white, thickly spotted and marked with reddish-purple, almost equal, elongated-triangular; lip dark purple, small, nearly flat. Colombia, 1890. When this plant is suspended in a basket, the flowers have an elegant appearance. (G. C. 1890, viii., p. 268, f. 44.) SYN. *M. Lowii.*

M. velifera (sail-bearing). *fl.* greenish-yellow, shaded brown, the tails clear dark yellow; odour unpleasant. Habit and growth as in *M. coriacea.* Colombia (?), 1878. (G. C. 1887, i., p. 744.)

M. Wallisii is a form of *M. Chimæra.*

M. Wendlandii (Wendland's). *fl.* white, tubular, solitary, ⅔in. long, the tails equal to the free triangular bodies; chin short; lip having an orange area before the apex, and very numerous small, dark purple spots; column white, with three mauve stripes. *l.* densely massed, spathulate, minutely bilobed. Colombia, 1887.

M. Winniana (Winn's). This is now regarded as a variety of *M. Chimæra.* It differs from the variety *Roezlii* by having longer tails.

M. xanthocorys (yellow bug). A variety of *M. caudata* (*Shuttleworthii*).

Hybrids.

NAME.	PARENTAGE AND RAISER.
Acis	*abbreviata* and *Chelsoni* (Hincks).
Ajax	*Chelsoni* and *percsteria* (Veitch).
Ameniana	*Veitchiana* and *tovarensis* (Sander).
Asmodia	*Chelsoni* and *Reichenbachiana* (Veitch).
Bocking Hybrid	*Veitchiana* and *cucullata.*
Cassiope	*triangularis* and *Harryana* (Hincks).
caudata-Estradæ	*Estradæ* and *Shuttleworthii* (*caudata*) (Veitch).
Chamberlainiana	*Harryana coccinea* and *Shuttleworthii* (Chamberlain).
Chelsoni	*Veitchiana* and *amabilis* (Veitch).
Circe	*Veitchiana* and *Schroderiana* (Veitch).
Courtauldiana	*rosea* and *Shuttleworthii* (Veitch).
Curlei	*macrura* and *tovarensis* (Curle).
Doris	*triangularis* and *racemosa Crossii* (Hincks).
Ellisiana	*Harryana* and *ignea* (Veitch).
falcata	*Lindenii* and *Veitchiana* (Drewett).
Fraseri	*ignea* and *Lindenii* (Fraser).
Gairiana	*Davisii* and *Veitchiana* (Veitch).
Gelengiana	*Shuttleworthii* and *xanthina* (Sander).
glaphyrantha	*infracta* and *Barlæana* (Veitch).
Heathii	*ignea rubescens* and *Veitchiana* (Heath).
Hebe	*coriacea* and *Veitchiana grandiflora* (Hincks).
Henrietta	*ignea rubescens* and *Shuttleworthii* (Ames).
Hincksiana	*tovarensis* and *ignea* (Hincks).
ignea-Chelsoni	*ignea* and *Chelsoni* (Ames).
Imogen	*Schlimii* and *Veitchiana* (Veitch).
Jessie Winn	*tovarensis* and *Davisii* (Winn).
Kimballiana	*Veitchiana* and *Shuttleworthii* (Sander).
Leda	*Estradæ* and *Arminii* (Hincks).
Mary Amee	*ignea* and *Gairiana* (Ames).
McVittiæ	*tovarensis* and *Veitchiana* (Stevens).
Measuresiana	*tovarensis* and *amabilis* (Sander).
Mundyana	Syn. *Heathii* (Sander).
Parlatoreana	*Barlæana* and *Veitchiana* (Veitch).
Pluto	*Gairiana* and *Harryana* (Hincks).
Pourbaixii	*Veitchiana* and *Shuttleworthii* (Linden).
Rebecca	*ignea erubescens* and *Shuttleworthii* (Ames).
Rushtonii	*ignea Echartii* and *racemosa Crossii* (Hincks)

Masdevallia—*continued.*

NAME.	PARENTAGE AND RAISER.
Shuttryana	*Shuttleworthii* and *Harryana* (Lawrence).
splendida	*Barlæana* and *Veitchiana* (Veitch and Nat. Hyb.).
Stella	*Estradæ* and *Harryana* (Hincks).
Veitchiano-Estradæ	*Veitchiana* and *Estradæ* (Hincks).

MASSANGEA. *M. Lindeni* and *M. musaica* are now classed as species of **Caraguata** by Baker, and by other botanists as **Guzmannia**; but *M. hieroglyphica* is referred to **Tillandsia** (which *see*).

MASSONIA. According to J. G. Baker, this genus now embraces about thirty-three species. To those described on pp. 335-6, Vol. II., the following should be added:

M. amygdalina (Almond-like).* *fl.* strongly Almond-scented, forming a dense, globose, sessile head; perianth white, ½in. long, with reflexed, lanceolate segments. *l.* two, ovate, acute, glabrous, decumbent, 2in. long. 1889.

M. angustifolia. The correct name is *Polyxena angustifolia.*

M. brachypus (short-stalked). *fl.* in a shortly-peduncled head; perianth white, ½in. long, with lanceolate segments. *l.* oblong, obtuse, thin, glabrous, 6in. long. Bulb 1½in. in diameter. 1874.

M. ensifolia. The correct name is *Polyxena pygmæa.*

M. jasminiflora (Jasmine-flowered). *fl.* scented like a ripe Pear; perianth white, green-tipped, ½in. long, with a slender tube and reflexed segments; head sessile. *l.* two, ovate, not spotted, 2in. to 3in. long. Bulb white, small. 1894. (B. M. 7465.)

M. odorata (scented). A synonym of *Polyxena odorata.*

MASSOVIA. Included under **Spathiphyllum** (which *see*).

MAST. In addition to Beech Mast, this name is also applied to Acorns, Chestnuts, &c.

MASTICH-TREE. *See* **Pistacia Lentiscus.**

MATÉ. *See* **Ilex conocarpa.**

MATHEA. A synonym of **Schwenkia** (which *see*).

MATHIOLA. Bentham and Hooker spell this name *Matthiola.* The Virginian Stock does not belong to this genus, but to **Malcolmia** (which *see*). To the species described on p. 336, Vol. II., the following should be added. *See also* **Stocks.**

M. annua is now regarded as a variety of *M. incana.*

M. græca (Grecian). A form of *M. incana.*

M. incana græca (Grecian). An entirely glabrous plant, with leaves of a beautiful green. Orient.

M. sinuata (sinuate). *fl.* nearly resembling those of *M. incana*, scented at night. July. *fr.*, pods compressed, velvety and glandular, muricate. *l.* oblong, tomentose; lower ones sinuated Stems nearly erect, branched. Europe (Britain), near the sea. Biennial.

Varieties. Florists usually separate these into three groups—Ten-Week, Intermediate, and Biennial. The first are the summer-flowering Stocks so largely used for bedding; the second are intermediate between the first and the last, and are better adapted for pot culture than outside; while the third embrace the well-known Bromptons, which flower in spring from seed sown the previous spring. By employing the various kinds judiciously, Stocks may be enjoyed practically the year through where glass is available. Some good varieties are: Ten-Week—Autumn Giant, 2½ft.; Giant Primrose, 1½ft.; Kelway's German Dwarf Improved, 1ft.; Mauve Beauty, 9in.; Princess May; Snowflake, 2ft.; and Triumph, 9in. Intermediate—Covent Garden, 1ft.; Emperor, 1ft.; Snowdrift, 1ft.; Todd's Crimson; and Winter Avalanche, 1½ft. Biennial—Cottager's, 2ft.; Giant White; New Giant, 2ft.; and Sunrise, 1ft.

MATONIA. Very little is known as to either the culture or the propagation of this, one of the rarest and handsomest of known Ferns, which, though at various times imported alive in this country, never seems to have made headway or even to have become established in any collection. Considering that it comes from Mount Ophir, Malacca, it should be as easily grown as some Cypripediums found wild in the same locality, which succeed admirably under artificial cultivation. Unfortunately, such is not the case; and although subjected

Matonia—*continued.*

to the same treatment, *M. pectinata* has not been successfully grown in this country for any length of time. On account of its peculiar beauty, however, its culture well deserves to be tried again whenever opportunities arise.

MATRICARIA. Much confusion exists in trade and other catalogues in respect of the members of this genus. The plants usually offered under the name of *eximia* are a variety of *Pyrethrum Parthenium*. There is a beautiful plant sometimes cultivated abroad under the name of *M. parthenoides*, Desf.

M. discoidea (disk-like). *fl.-heads* all shortly pedunculate; involucral bracts white-scarious with a greenish centre, scarcely half the length of the well-developed, greenish-yellow, ovoid disk. *l.* bi- or tripinnately dissected into short and narrow, linear lobes. *h.* 9in. to 12in. North America. A very leafy, somewhat aromatic, glabrous annual.

M. inodora plenissima (very double). The correct name of *M. i. flore-pleno.*

M. Parthenium. A synonym of *Pyrethrum Parthenium.*

MATRIMONY VINE. *See* **Lycium.**

MATS. Well-known articles employed for the protection of tender plants on walls or in the open during the winter; also for covering frames and similar structures in frosty weather. Nurserymen find them almost indispensable for enveloping tender plants consigned to customers, and the quantity employed is enormous. The best mats are received from Russia, and are made from the inner bark of a tree; they are usually sold as "heavy" and "light." Straw is occasionally employed for making Mats, but such rapidly decays, and after being used a few times such Mats become untidy.

MATTEUCCIA (named in honour of *C. Matteucci*, an Italian physician). ORD. *Filices.* A small genus, under which some modern American botanists include the well-known Ostrich Fern (*Onoclea Struthiopteris*), though the reason for the separation is not given. We have, however, followed Hooker and Baker.

MATTHIOLA. According to Bentham and Hooker and the "Index Kewensis," this is the correct way of spelling **Mathiola.**

MATTHISONIA. A synonym of **Schwenkia** (which *see*).

MATTUSCHKIA. A synonym of **Saururus** (which *see*).

MAUDLIN, SWEET. *See* **Achillea Ageratum.**

MAUHLIA. A synonym of **Agapanthus** (which *see*).

MAURANDIA [the correct spelling]. To the species described on p. 337, Vol. II., the following should be added:

M. antirrhiniflora (Antirrhinum-flowered). *fl.*, corolla purple or sometimes white, ½in. to 1in. long, with a nearly closing palate. July. *l.* triangular-hastate or the lower ones cordate-hastate; lateral lobes often with a posterior tooth. Texas, California, &c. A low or tall-climbing perennial. The correct name is *Antirrhinum maurandioides.*

M. atrosanguinea is synonymous with *Rhodochiton volubile.*

M. Barclaiana. Of this species there are varieties with white, rose-purple, and dark purple flowers. *M. Lucceyana* is a pink-flowered form.

M. erecta (erect). *fl.* axillary, solitary, about 1½in. long; corolla narrow, slightly oblique. *l.* long-petiolate, rather thick, orbicular-cordate or sometimes nearly reniform, obscurely lobed or deeply crenate, 1½in. across. North-eastern Mexico, 1832. An erect, branched, viscous herb.

M. Luceyana (Lucey's). A form of *M. Barclaiana.*

M. scandens is a form of *M. semperflorens.*

MAUROCENIA. A synonym of **Cassine** (which *see*).

MAVIA. A synonym of **Erythrophlœum** (which *see*).

MAXILLARIA. Including *Dicrypta* and *Heterotaxis*. *Xylobium* was formerly included hereunder, but is now kept distinct. Though the majority of Maxillarias are best accommodated when grown in pots, *M. Sanderiana* is best grown in baskets, so that they may be suspended

Maxillaria—*continued.*

near the roof-glass. Not only is a light position desirable to induce the plants to flower freely, but they have a habit of producing their flower-scapes from the base of the growth; these, having a downward tendency, often pierce the potting compost and make their appearance through the lower bars of the basket, and not infrequently through those at the bottom. There is not a quainter or more attractive flower in the whole Orchid family than this species when fully expanded. By cultivation in baskets, the plants are easily suspended in such a position that their attractive characteristics are displayed to the best advantage.

Fibrous peat and living sphagnum make a good potting compost. This species requires the temperature of the intermediate house and a liberal supply of moisture at the root during the active season of growth.

To the species described on pp. 338-9, Vol. II., the following should be added. Several plants formerly included under *Maxillaria* are now referred to **Bifrenaria, Lycaste,** and **Zygopetalum.**

M. Anatomorum, A synonym of *M. venusta.*

M. angustifolia (narrow-leaved). A synonym of *M. variabilis.*

M. Augusta Victoria. *fl.* having white sepals and petals and a broad, yellow lip with some purple markings. Habitat not recorded, 1898. Allied to *M. Sanderiana.*

M. callichroma (beautifully-coloured).* *fl.*, sepals white at base, golden-yellow at apex; sepals purplish-brown at base, white in the middle, yellow at the extremities, strongly curved backwards; lip three-lobed, the lateral lobes purplish-brown, the mid-lobe white, the disk yellow. Venezuela. An old and beautiful species, allied to *M. luteo-alba.*

M. citrina (citron-yellow). A synonym of *Zygopetalum citrinum.*

M. crocea (yellow). *fl.* orange-yellow; sepals linear, 1in. long; petals shorter, bent forwards; lip brownish-red, fleshy, reflexed, crisped on the margin; scapes 4in. to 5in. long. *l.* narrow-ligulate, 5in. to 7in. long. Pseudo-bulbs 1in. long, one-leaved. Rio Janeiro, 1833. (B. R., t. 1799.)

M. c. Lietzei (Lietze's). *fl.*, lip obsoletely three-lobed; disk yellow, the margin and outside purplish-brown; scapes shorter than the leaves. Brazil, 1889.

M. densa (dense). A synonym of *Ornithidium densum.*

M. dichroma (two-coloured). *fl.* 3in. across; sepals and petals white and brownish-purple; lip margined with purple; scape 6in. long, clothed with sheathing bracts. *l.* oblong-lanceolate, 1ft. long. Peru, 1898. Allied to *M. venusta.* The flowers of this species last a long time.

M. eburnea (ivory-white). A synonym of *M. grandiflora.*

M. elegantula (rather elegant). *fl.* having yellow and white segments, spotted with brown. Habitat not recorded, 1897. Allied to *M. fucata.* (G. C. 1897, xxii., pp. 383, 420)

M. Endresii (Endres'). *fl.*, sepals and petals light ochreous, triangular-ligulate, acuminate, aristate; lip ochre, with a yellow disk, and purple borders and veins on the side lobes; callus triangular, depressed; peduncle rather short. *l.* cuneate-ligulate, blunt-acute. Pseudo-bulbs very broad, elliptic. 1886.

M. fucata (painted). *fl.*, sepals and petals white outside, white inside at base, purple in the middle, yellow at apex, the sepals spotted red at apex, triangular, the lateral ones broadest, with reflexed tips, the petals rhomboid, blunt-angled at the sides; lip ochreous, striped brown, oblong-elliptic, trifid in front, the side lobes rounded, margined brown, the mid-lobe small, semi-oblong, emarginate; peduncles 9in. long, with many sheaths. *l.* oblong-lanceolate, acuminate, 8in. to 9in. long; petioles 5in. to 7in. long. 1886. Allied to *M. irrorata.* (G. C. 1883, iv., p. 577, f. 81, misprinted *M. fuscata.*)

M. fuscata. A misprint for *M. fucata.*

M. glumacea (glume-like). *fl.*, sepals dull yellowish-green, glume-like, rigid; petals similarly coloured; side lobes of lip dull maroon, the front lobe deep blackish-brown, with yellow margin and apex, the fleshy callus of a shining purplish-brown; scapes short, with four or five imbricating scales. Brazil, 1892.

M. Harrisoniæ (Mrs. Harrison's). A synonym of *Bifrenaria Harrisoniæ.*

M. Houtteana (Louis van Houtte's). *fl.*, sepals and petals cinnamon-brown with a narrow yellow margin, brownish-green behind, the petals smaller; lip of a gamboge-yellow, spotted with reddish-purple, gently reflexed; scape short. *l.* linear-ligulate, 4in. to 6in. long. Pseudo-bulbs compressed, 1½in. to 2in. long. Guatemala, before 1849.

M. Huebschii (Huebsch's). *fl.* white; lateral sepals much rounded, like a goitre; petals linear-rhombic, acute; lip transverse, rhombic, with a yellow, emarginate callus on the disk, a mauve-purple margin inside, and a few dots and blotches at the base outside; column white, with mauve stripes in front. Ecuador, 1883. Allied to *M. fucata*

Maxillaria—*continued.*

M. Kalbreyeri (Kalbreyer's). *fl.*, sepals and petals greenish-white, the upper sepal and petals ligulate, the lateral sepals triangular, acute; lip greenish-white, marked mauve-purple on the outer margins, oblong-ligulate, blunt, toothleted on the anterior margins, a little broader towards the base. *l.* oblong-ligulate, 9in. high, 1in. broad. Pseudo-bulbs about 2in. long and 1in. broad. Colombia, 1895.

M. Kimballiana (Kimball's). A synonym of *M. præstans.*

M. Lehmanni (Lehmann's).* *fl.* white; side lobes of the lip light reddish-brown and covered with fragile hairs inside, pale ochre with dark chestnut veins outside, the front lobe sulphur, triangular, wavy. Ecuador, 1886. A showy species.

M. lepidota (scaly). *fl.*, sepals yellow, with brown tails, 2½in. long; petals wholly yellow, shorter; apical half of lip yellow, spotted with blackish-purple, the lateral margins incurved; column yellow. *l.* linear-lanceolate, 9in. to 12in. long. Pseudo-bulbs 1in. to 1½in. long, one-leaved. Colombia, &c., 1877.

M. leptosepala. The correct name is *M. setigera.*

M. Lindeniæ (Mme. Linden's). *fl.* rather large; sepals milk-white, somewhat fleshy, acuminate; petals milk-white, with two or three pale rose-coloured lines; lip very pale yellow, with five or six reddish bands on the lateral lobes. Habitat not recorded, 1894. (L. x., t. 464.)

M. longisepala (long-sepaled). *fl.*, sepals pale purplish-brown, with darker striation, very narrow, nearly 4in. long; petals rather shorter; lip light yellowish-green, with radiating dark reddish-brown lines on the margin; scape 6in. long. *l.* narrow-ligulate, 6in. to 9in. long. Pseudo-bulbs tufted, 1in. to 1½in. long. Venezuela, 1890. (L. vi., t. 248.)

M. macrophylla (large-leaved). A synonym of *Lycaste macrophylla.*

M. marginata (margined). *fl.* 1½in. across vertically; sepals orange-yellow, with a narrow, dark red margin and a red line behind; petals much smaller; side lobes of lip streaked obliquely with reddish-purple, the front lobe light yellow, reflexed; scape 3in. to 4in. long. *l.* linear-lanceolate, 5in. to 8in. long. Pseudo-bulbs 1½in. to 2in. long, one- or two-leaved. Rio Janeiro, 1830. SYN. *Cymbidium marginatum* (B. R. 1530).

M. mirabilis (remarkable). *fl.* 2in. across; sepals orange and crimson, spotted with dark brown, reflexed; petals much smaller, yellow, with reddish-brown spots and lines; lip yellow, with a marginal row of spots; scape 8in. long, one-flowered. *l.* linear-oblong, 1ft. long. Pseudo-bulbs small, compressed. Habitat not recorded, 1894. (L. ix., t. 417.)

M. Molitor (producer). *fl.* dingy yellow; sepals tinged brown, acute, the lateral ones narrower; petals smaller, oblong-lanceolate, often reflexed at top; lip marked brown, trifid, the mid-lacinia triangular, blunt, wavy, the side ones rounded; column yellow, with red spots in front. *l.* and pseudo-bulbs as in *M. grandiflora.*

M. Mooreana (Moore's). *fl.* cream-coloured, with maroon-purple stripes on each petal and a farinaceous lip margined with purple. Guatemala, 1895. Allied to *M. grandiflora.*

M. Muelleri (Mueller's). *fl.*, sepals and petals clear yellow; lip yellow, dotted with purple; scape one-flowered, with two inflated bracts. *l.* solitary, leathery, 6in. long, 1in. broad. Pseudo-bulbs somewhat compressed, two-angled. Habitat not recorded, 1890. Allied to *M. rufescens.* SYN. *M. squamata* (of gardens).

M. neophylla (new-leaved). *fl.* covered at base by a very wide bract; chin small; sepals and petals pale yellow, with numerous brown spots, acuminate; lip trifid; peduncle covered with dark brown sheaths. *l.* solitary, long-stalked, 2½in. long, ¾in. broad, very strong and thick. Pseudo-bulbs small, rugose, lenticular. Colombia, 1879.

M. ochroleuca (yellowish-white). *fl.* yellowish-white, scented, fascicled; sepals very acuminate; petals similar; lip three-lobed. *l.* ensiform, erect. Pseudo-bulbs oblong, compressed, two-leaved. Rio Janeiro. (L. B. C., t. 1904.)

M. parva (small). *fl.* yellow, borne on a short scape. *l.* about 1in. long. Pseudo-bulbs small. Brazil, 1895.

M. præstans (excelling). *fl.*, sepals and petals honey-yellow, the former ligulate, acute, the latter narrow, shorter, acuminate or blunt-acute; lip trifid, the basilar laciniæ whitish, with purple spots, the mid-lacinia brownish-yellow, very thick, cuneate-oblong, acute; column yellow, spotted purple. *l.* cuneate-ligulate, blunt-acute. Pseudo-bulbs oblong, ancipitous, with convex sides. Guatemala, 1834. SYN. *M. Kimballiana.*

M. punctata (dotted). *fl.* 2½in. across; sepals and petals light yellow, paler at back, with a few red spots; petals narrower and more acute; lip yellow with red lines, obscurely lobed; column pale yellow, red at apex; scape 3in. to 4in. long. *l.* linear-lanceolate, acute, 7in. to 10in. long. Pseudo-bulbs ovoid, about 1in. long, one-leaved. Brazil, 1833. (L. B. C., t. 1914.)

M. Rollissoni (Rollisson's). A synonym of *Zygopetalum Rollissoni.*

M. Sanderiana (Sander's).* *fl.* ivory-white, 4in. to 5in. across, the bases of the sepals and petals and the outside of the lip dark vinous-crimson, the inside of the lip yellowish, with vinous-crimson spots. May. *l.* stalked, broadly oblong, obtuse, apiculate. Pseudo-bulbs compressed, one-leaved. Ecuador, 1883 or 1884. The finest known species. (B. M. 7518; Gn. 1837, xxxii., p. 60, t. 606; R. scr. i., t. 25; W. O. A. x., t. 463.)

M. S. Fuerstenbergiana (Fuerstenberg's). *fl.* ivory-white, having only a few pale purplish spots on the petals. 1894.

M. S. xanthoglossa (yellow-lipped). *fl.*, sepals and petals having an exceptional number of crimson spots; lip deep yellow. 1893. (J. H. xxvi., p. 494, f. 89.)

M. sanguinea (blood-coloured). This species is allied to *M. tenuifolia*, which it resembles in habit; but it differs in having the sepals and petals of a dull reddish-brown and yellow and the lip purplish-crimson. Chiriqui, Colombia, 1895.

M. setigera (bristle-bearing). The correct name of *M. leptosepala.*

M. speciosa (showy). *fl.* pallid, covered with numerous blackish-purple spots; sepals and petals narrow, acuminate, spreading, 5in. to 6in. long; peduncle one-flowered. Colombia, 1876.

M. squamata (scaly). A garden name for *M. Muelleri.*

M. Steelii (Steel's). A synonym of *Scuticaria Steelii.*

M. striata (striated).* *fl.* about 5in. in diameter; sepals and petals greenish-yellow, striped with brownish-purple; lip white, with amethyst-purple, vein-like lines. Peru, 1893. Habit as *M. venusta.* (L. ix., t. 398.) A beautiful species.

M. triloris (three-strapped).* The flowers of this species very closely resemble those of *M. luteo-alba*, but differ in having a pale purplish tint; they are very freely produced. South America. (B. H. 1870, t. 13.)

M. varicosa (varicose-veined). *fl.* few in a raceme. *l.* petiolate, oblong-ligulate, acuminate, 1ft. or more in length, 2in. broad. Pseudo-bulbs fusiform, furrowed, 3in. long. Bolivia, 1883.

M. Warreana (Frederick Warre's). A synonym of *Warrea tricolor.*

M. xanthina (yellow). A synonym of *Zygopetalum xanthinum.*

In addition to the more decorative species described in this work, a large number are cultivated in botanical establishments.

MAXIMILIANA. *M. Jagua* is included in the Kew Collection, and has been introduced to Continental gardens, but it is not in general cultivation in this country.

MAXIMILIANA (of Martius, in "Flora"). A synonym of **Cochlospermum** (which *see*).

MAY BUGS. These Beetles are near relatives of the destructive **Cockchafers** (which *see* for methods of dealing with them).

MAYBUSH, CALIFORNIAN. *See* **Photinia arbutifolia.**

MAYPOLE, WEST INDIAN. *See* **Spathelia simplex.**

MAYS. A synonym of **Zea** (which *see*).

MAYTENUS. *M. chilensis* is only a form of *M. Boaria.*

MAZE. An arrangement of hedges, the paths between being so puzzling that it is extremely difficult to find the exit. Yew forms an excellent hedge, and quickly attains the necessary size. Holly is also excellent, but slower in growth; the same applies to Box. Other suitable plants are Beech, Privet, Laurel, &c.

MAZEUTOXERON. A synonym of **Correa** (which *see*).

MEADOW BEAUTY. *See* **Rhexia virginica.**

MEADOW GRASS. *See* **Poa.**

MEADOW SAXIFRAGE. *See* **Saxifraga granulata, Seseli,** and **Silaus pratensis.**

MEALIES. *See* **Zea Mays.**

MEALY BUG. A popular name for several insects which cover their bodies with a meal-like substance. This characteristic, however, brings together a few insects which are not Mealy Bugs proper, although they are meal-covered —*Pseudococcus ulicis*, found upon Gorse, &c.; and the root-feeding *Ripersia terrestris.* Strictly speaking, the true Mealy Bugs are *Dactylopius citri*, a ubiquitous pest; *D. longispinus*, found upon many plants; and *D. Walkeri*, a Grass-infesting species. As a rule, the difficulty in dealing with these pests is not so much in regard to the perfect insects as with the egg-sacs. What is known as Kerosene Emulsion is one of the best insecticides, but this must not be applied indiscriminately, or the remedy will

Mealy Bug—*continued.*

be worse than the disease. Its effect upon any plant should first be tested before anything like a wholesale application is attempted. Hot water, where it can be kept at the required temperature (*see* **Insecticides**) will kill the perfect insects; but the egg-sacs do not appear to be affected. Soft-soap solution is also excellent, but here again it must be used of a strength in accordance with the plants or parts of plants under treatment. A strength, for instance, that could be applied with safety to the trunks might prove fatal to more susceptible parts of the same tree. For very tender plants under glass, 1oz. to the gallon of water will suffice; in the case of hard-wooded subjects the quantity of soap may be doubled; while in the case of tree-trunks, from 6oz. to 8oz. would not do any damage. *See also* remedies under this heading in Vol. II., p. 340.

MEASUREMENTS. In plant, insect, and other descriptions, it is often necessary for purposes of accuracy to employ Measurements other than inches, such as Line and Millimetre. In the former case twelve lines may be said to go to an inch; and, roughly, twenty-five millimetres represent an inch. A more accurate method of arriving at the number of inches in a given number of millimetres is to multiply the millimetres by 10 and then divide by 254.

MECONOPSIS. *M. diphylla* and *M. petiolata* are, according to the "Index Kewensis," identical with **Stylophorum diphyllum** (which *see*). Seeds of *M. cambrica* should be sown outdoors in April; while seeds of *M. heterophylla* may be sown outside in either April or autumn.

To the species described on p. 341, Vol. II., the following should be added:

M. cambrica flore-pleno (double-flowered). A globular, double-flowered variety. 1896. (G. C. 1896, p. 671, f. 111.) There is also a beautiful garden form of the Blue Himalayan Poppy (*cambrica*), known as Orange King. It is an excellent rock plant, and about 1ft. high.

M. heterophylla (variable-leaved).* *fl.* coppery-orange, with dark crimson centre, 1½in. across, with a Lily of the Valley-like scent. Summer. *l.* few and remote, pinnately divided; segments of the lower ones ovate, incised, and petiolulate, those of the upper ones linear, entire, somewhat confluent. *h.* 1ft. California. A most beautiful annual, suited alike to indoor and to outdoor culture. In the latter case it attains a much greater height than that given above. It should prove a valuable plant for decorative purposes, as the flowers are produced well above the foliage, and last well. It seeds freely. (B. M. 7636.)

M. quintuplinervia (five-nerved). *fl.* pale violet, solitary, nodding; petals shortly clawed, rhomboid-ovate, 1½in. long; stamens in many series; scape erect, at length 9in. high. *l.* lanceolate, narrowed to the petioles, entire, five-nerved. North-west China, 1877. Plant hairy. Perennial. (R. G. 1892, t. 880 b-d.)

MEDIAN APPLE. *See* **Citrus medica.**

MEDICA. A synonym of **Tourretia** (which *see*).

MEDICAGO. To the species described on p. 341, Vol. II., the following should be added:

M. Echinus (hedgehog-like). Calvary Clover. *fl.* yellow; peduncles five- or six-flowered, longer than the petioles. July. *fr.* cochleate-ovate, deeply reticulated, spiny; spines laterally appressed, very long and very acute. *l.*, leaflets obovate or obcordate, obsoletely toothed. *h.* 6in. South of France, 1818. Annual.

M. scutellata (saucer-shaped). *fl.* yellow; peduncles one- or two-flowered. *fr.* cochleate, many-seeded, convex-hemispherical above, flat beneath, thickly reticulate-veined. *l.*, leaflets obovate. Stem diffuse. South Europe. Annual.

MEDICOSMA (from *medica*, and *osme*, smell; in allusion to the scent of the flowers, which resembles that of *Citrus medica*). ORD. *Rutaceæ*. A monotypic genus, the species, *M. Cunninghamii*, being the plant described in Vol. I. as *Acronychia Cunninghami* (B. M. 3994). Leaves mostly opposite, consisting of a single leaflet obscurely articulate on a short petiole, oblong-elliptical or rarely obovate-oblong, obtuse or acuminate, 3in. to 6in. long.

MEDINILLA. To the species described on p. 342, Vol. II., the following variety should be added:

M. magnifica rubra (red). A fine variety, having darker flowers than in the type. 1888.

M. Teysmanni (Teysmann's). The correct name of *M. amabilis*.

MEDLAR. Medlar-leaves are attacked by a species of fungus known popularly as Medlar Cluster Cups, and scientifically as *Gymnosporangium confusum*. It is a close ally of *Gymnosporangium sabinæ*, whose æcidium-stage grows upon Pear-leaves, and is sometimes called *Roestellia cancellata*. The Medlar Cluster Cups will not grow upon Pears, but they are commonly found upon Hawthorn. The æcidia, or cluster cups, which divide or shred, are situate upon orange-red thickened spots having bright red margins. The species and several of its allies are interesting to biologists and others, inasmuch as they belong to what are called heteræcious fungi, two host-plants being necessary to complete the cycle. In the fungus under notice, certain species of Juniper are necessary to grow the teleutospores, as they are in several closely allied species. Such spores, produced upon the Juniper in spring, consist of jelly-like masses and are readily seen. To control this and similar fungi is difficult in the extreme, as the two host-plants may be situate in different gardens some distance apart. To spray with the ordinary fungicides will not avail in the least, and the cultivator must if possible find out where the Junipers are situated. If in a neighbouring garden he must get permission to cut out the portions infected, and cover with tar, or else to uproot the trees. These fungi have a very debilitating effect upon the trees attacked.

MEGACARYON (from *megas*, large, and *karuon*, a nut; in allusion to the large, ovoid, acuminate nutlets). ORD. *Boragineæ*. A monotypic genus. The species is a coarse, setose-hispid, biennial or perennial herb, closely allied to *Echium*. It thrives in any fairly good soil, and may be increased by seeds.

M. orientale (Oriental). *fl.* rosy-lilac, disposed in unilateral, forked, elongated spikes; corolla 1¼in. long, almost regular, tubular-funnel-shaped. *l.*, radical and lower ones 1ft. to 1½ft. long, 2in. to 3in. broad, broadly oblong-lanceolate, acuminate, canescent-velvety; upper ones shorter, bristly; floral ones narrow-linear-lanceolate. Stems thick, 3ft. or more in height, pyramidally branched. Orient, 1897. (G. C. 1897, ii., p. 226, f. 67-8.)

MEGACHILE. *See* **Aculeate Hymenoptera,** Vol. V.

MEGACLINIUM. To the species described on pp. 342-3, Vol. II., the following should be added:

M. Clarkei (Major Trevor Clarke's). *fl.* green, much speckled with purplish-brown, ¼in. apart; scape 6½in. long. *l.* oblong, obtuse, 2½in. to 2¾in. long. Pseudo-bulbs broadly oblong, acutely four-angled, 1in. long, ¾in. broad, two-leaved. Western tropical Africa, before 1891.

M. Imschootianum (M. A. van Imschoot's). *fl.* yellowish-green, with brown spots; rachis 5in. to 6in. long; scape 10in. long. *l.* linear-oblong, obtuse, 6in. long. Pseudo-bulbs acutely triangular, oblong, 1¾in. long, one-leaved. Western tropical Africa, 1895.

M. leucorhachis (white-rachised). *fl.* yellow, velvety; lip recurved; scape erect, 6in. to 7in. long; rachis white. *l.* linear-oblong, obtuse, 6in. to 7in. long. Pseudo-bulbs ovoid-oblong, acutely four-angled, 2½in. long. Upper Guinea, 1891.

M. minutum (minute). *fl.* dull maroon or orange-red, greenish-yellow towards the base of the segments, very small; rachis 1in. long, about twelve-flowered; scapes sub-erect, 1¼in. long. August. *l.* linear-oblong, ¼in. to 1in. long. Pseudo-bulbs ovoid-oblong, obscurely triangular, ¼in. to 1¼in. long, two-leaved. Upper Guinea, 1883. (B. M. 7314.)

M. Nummularia (Moneywort-like). This is closely allied to *M. minutum*, but has a shorter raceme, with six to eight minute, purplish flowers, leaves 1in. long, and flattened pseudo-bulbs. Cameroons, 1894.

M. oxyodon (sharp-toothed). *fl.* like those of *M. falcatum*, but having the petals longer and more arched; lip membranous, three-lobed. *l.* two, lanceolate, acute, 2in. long, ¾in. broad. Pseudo-bulbs spherical, four-angled. Madagascar, 1888. SYN. *Bulbophyllum oxyodon.*

M. pusillum (dwarf). *fl.* green and purple, a little darker than the rachis, which is 1¼in. long; scapes about 4in. long. *l.* linear-oblong, obtuse, 3in. long, ¼in. broad. Pseudo-bulbs ovoid-oblong, four-angled, 1in. to 1¼in. long, two-leaved. Eastern tropical Africa, 1894.

M. scaberulum (slightly scabrous). *fl.* dull purple, the base of the sepals whitish-green spotted with purple, roughish outside; inflorescence erect, 3in. to 4in. long. *l.* two, elliptic-oblong, 2in. or more in length. Pseudo-bulbs tetragonal. Pondoland, 1883.

M. triste (sad). *fl.* green, speckled with black, velvety; rachis thick and fleshy, 3in. to 4in. long; scape 1¼ft. long, with

Megaclinium—*continued.*

nearly a dozen sheaths near the base. *l.* linear-oblong, obtuse, 3in. to 5in. long. Pseudo-bulbs obtusely three-angled, 1½in. to 2in. long, two-leaved. Tropical Africa (?), 1894.

M. Sandersoni has also been introduced, but is not in general cultivation.

MEGALOTHECA. A synonym of **Restio** (which *see*).

MEGARRHIZA CALIFORNICA. Cogniaux and Bentham and Hooker refer this to *Echinocystis fabacea*; but Sereno Watson separates it therefrom.

MEGASEA. Included under **Saxifraga** (which *see*).

MEISTERIA. Included under **Enkianthus** (which *see*).

MELALEUCA. *M. neriifolia* and *M. salicifolia* are synonyms of **Tristania neriifolia** (which *see*).

MELAMPODIUM (said by Theophrastus to have been named after Melampus, who first used the plant). ORD. *Compositæ*. A genus embracing about eighteen species of stove, greenhouse, or hardy, annual or perennial herbs, rarely under-shrubs, mostly found in the warmer parts of America. Flower-heads yellow, terminal in the upper axils, usually rather small, heterogamous, radiate. Leaves opposite, entire or toothed. *M. paludosum* (SYNS. *M. divaricatum, M. ovatifolium*) and *M. perfoliatum* have been introduced, but they are not of much horticultural value.

MELAMPSORA SALICINA. *See* **Salix—Fungi.**

MELANCHRYSUM. A synonym of **Gazania** (which *see*).

MELANDRYUM. This genus is kept up by Mr. F. N. Williams, in his monograph of *Silene*, &c., in the "Journal of the Linnean Society," vol. xxxii. *See* **Silene.**

MELANOCARPUM SPRUCEI. A synonym of **Pleuropetalum costaricense** (which *see*).

MELANORRHŒA. *M. usitata* is the correct name of the plant described as *M. usitatissima*.

MELANOSELINUM. Included under **Thapsia** (which *see*).

MELANTHESA. A synonym of **Breynia** (which *see*).

MELANTHIUM. Some of the species formerly included in this genus are now referred to **Androcymbium, Bæometra, Dipidax, Helonias, Whiteheadia, Wurmbea,** and **Zygadenus.**

MELARHIZA. A synonym of **Wyethia** (which *see*).

MELASPINÆA. A synonym of **Ægiceras** (which *see*).

MELASTOMA. Several species formerly included hereunder are now referred to **Amphiblemma** and **Pleroma** (*Tibouchina*).

M. candidum (white). *fl.* pink, three to seven in a short cyme; calyx canescent; petals 1¼in. to 1½in. long; bracts densely pilose. Summer. *l.* ovate, acute, 2in. to 6in. long, densely bristly above, villous beneath; petioles ¼in. to ¾in. long. Branches hoary, obtusely tetragonal; young ones and petioles densely strigose-scaly. *h.* 4½ft. South China. *M. malabathricum* (of B. R. 672) is probably the same as this.

M. decemfidum (ten-cleft). The correct name of *M. sanguineum*. SYN. *M. malabathricum*, Sims (B. M. 529).

M. malabathricum. *See also* **M. candidum** and **M. decemfidum.**

M. villosum (villous). The correct name of *Pleroma villosum*.

MELHANIA. To the species described on p. 345, Vol. II., the following should be added:

M. erythroxylon. *Trochetia erythroxylon* is synonymous with this species.

M. Melanoxylon (dark-wooded). *fl.* white, Malva-like, 1½in. across, with a crimson blotch at the base of the column formed by the purple stamens and green stigma. *l.* ovate, acuminate, slightly toothed, 2in. long, dark green above, covered beneath with soft, silky, white hairs. *h.* 20ft. St. Helena. A shrubby, stove tree. (G. C. 1890, vii., pp. 512-3, f. 81.)

MELIA. To the information given on pp. 345-6, Vol. II., the following should be added:

Melia—*continued.*

M. Azedarach umbraculiformis (umbrella-formed). Texas Umbrella Tree. The habit of this curious variety is indicated in its name. 1894. (G. & F. 1894, vii., p. 92, f. 20.)

M. floribunda (abundant-flowered). A garden synonym or variety of *M. Azedarach*.

M. sempervirens is identical with *M. Azedarach*.

MELICA (an old name, from *meli*, honey). Melic Grass. ORD. *Gramineæ*. A genus embracing about thirty species of mostly hardy, erect, perennial Grasses, broadly distributed. Spikelets one-, two-, or rarely several-flowered, narrowly or loosely paniculate; glumes two, usually large. Leaves soft, flat or convolute. The species here described thrive under ordinary treatment, and may be increased by seeds or by division of the tufts. The species named are all excellent for bouquets.

M. altissima (very tall).* *fl.* spikelets pedicellate; panicle elongated, coarctate, unilateral, interrupted, the branches appressed. June and July. *l.* lanceolate-linear; upper ones much the smaller. Culms strong, erect. *h.* 3½ft. Siberia, &c. A hardy, tufted species. SYN. *M. sibirica*. There is a good variety of this known as *atropurpurea*.

M. ciliata (ciliated). *fl.*, spikelets erect; outer petal ciliated; panicle somewhat spicate. May to July. *l.* stiff, glaucous. *h.* 1ft. to 1½ft. Europe, &c. Hardy. There is a variety of this, *penicillaris*.

M. macra (large).* *fl.*, spikelets disposed in a spike-like, unilateral raceme; glumes very sharp. Summer. *l.* spreading, lanceolate, greyish-green, sharp. *h.* 1½ft. Montevideo. A half-hardy, tufted species.

M. papilionacea (butterfly-like).* *fl.*, spikelets purple, disposed in narrow, slender panicles, which are branched from the base. Summer. *l.* fine, tufted. *h.* 1ft. Argentina and Brazil, 1890. An ornamental, half-hardy species.

M. sibirica (Siberian). A synonym of *M. altissima*.

MELIDORA (in part). Synonymous with **Enkianthus** (which *see*).

MELINOSPERMUM. A synonym of **Dichilus** (which *see*).

MELINUM. A synonym of **Zizania** (which *see*).

MELLOCA. A synonym of **Ullucus** (which *see*).

MELOCACTUS. Melocactuses like a tropical temperature all the year round, with as much sunlight as possible, and a moist atmosphere for about three months during summer, when growth is most active. Very little soil is required, as the largest stems have comparatively few roots; indeed, imported stems have been known to live, and even make growth, nearly two years without pushing a single root; but of course this was abnormal, and was no other than the using-up of the nourishment stored in the stem before it was removed from its native home. Large imported plants are very rarely established; and even when established, they do not thrive long, owing to the fact that, after the cap has commenced to form, no further stem-growth is made. Young plants grow very slowly, a plant 3ft. across taking, according to Sir W. Hooker, from 200 to 300 years to reach that size. It has been stated that grafting is a good plan to adopt for the Melocactus, Mr. F. T. Palmer, in "Culture des Cactées," recommending the following treatment for *M. communis*: Take a *Cereus peruvianus* of about the same diameter as that of the base of the Melocactus, cut off the head of the former, but not so low as to come upon the hard, ligneous axis, and then pare off the hard epidermis and ribs for about 1in. Next take off a slice from the base of the Melocactus, also paring off about 1in. of the epidermis all round; place the two together, and bind on firmly with strong worsted. In warm weather, a union should take place in about two months, but it will be safest to allow the ligature to remain till growth commences. The precaution of paring off the hard skin and ribs is absolutely necessary, as the juicy centre contracts, and the rind, or epidermis, does not. There would, therefore, be a cavity formed sufficient to prevent all cohesion, be the graft tied on ever so tightly.

Large imported stems should be kept perfectly dry for about a fortnight, and if they show any signs of rottenness, the bad portions should be cut away; exposure to the air for a few days will generally cause these pared places to callus over. At all times, even when the stems appear to be in good health, a look-out should be kept for decayed patches, especially about the base.

Melocactus—*continued.*

Propagation may be effected by means of seeds, which usually follow quickly after the flowers produced on cultivated specimens; also by means of offsets, which are formed about the base of the stem if the top of a growing plant is cut out. As the cap is the most remarkable part of *M. communis*, the purchase of large imported stems, in preference to young ones raised from seeds, is recommended; for, as the cap does not form till the stem attains a large size, there would be small hope of seedlings reaching the flowering stage during a lifetime.

To the species described on p. 348, Vol. II., the following should be added:

M. latispinus (broad-spined). A synonym of *Echinocactus cornigerus.*

FIG. 568. MELOCACTUS MIQUELII.

M. Miquelii (Miquel's). *fl.* unknown. Stem oval, dark green; ribs fourteen, well defined; spines in small tufts of eight or nine, short, blackish-brown, less than ½in. long, one central, the others radiating; cap cylindrical, 3in. high, 1¼in. in diameter, composed of layers of snow-white threads, mixed with short, reddish bristles. St. Croix, West Indies. See Fig. 568.

The following have been introduced to Continental gardens, or are described in books, but are not in general cultivation in this country: *M. amœnus, M. goniodacanthus, M. humilis* (R. G. 1897, t. 1439), *M. Lehmanni, M. pyramidalis, M. Zuccarini.*

MELON. Occasionally Melons in this country, in common with other *Cucurbitaceæ*, are attacked by a destructive form of Mildew (*Peronospora* (*Plasmopara*) *cubensis*). In America, however, the disease is very rife and spread over a wide geographical area. The under-surface of the foliage is the part attacked, and the appearance it presents is not unlike that produced by the well-known Downy Mildew of the Vine. Generally the leaves have a sickly and an unhealthy look—brown or yellow, and spotted—and are shed. Directly the disease is noted, sprayings with weak Bordeaux Mixture or with sulphide of potassium should be made. Further, all decayed and decaying leaves should be collected and burned. This disease was known as far back as Berkeley's time, but it does not appear to have caused much anxiety amongst growers.

Varieties. To the varieties enumerated in Vol. II., p. 351, the following should be added in their respective classes:

Class I. Green and White-fleshed.

Ingestre Hybrid. Fruit medium, of a beautiful golden-yellow, with prominent netting; flesh white, melting, very juicy, and of exquisite flavour.

Knowsley Favourite. Fruit medium to large; flesh green, melting, and of fine flavour. An early, free-setting variety.

The Countess. Fruit medium; skin bright yellow and beautifully netted; flesh deep white, melting, and delicious in flavour.

Melon—*continued.*

Class II. Scarlet-fleshed.

Beauty of Sion. Fruit medium, round; skin golden-yellow and nicely laced; flesh remarkably deep, juicy, melting, and rich in flavour.

Masterpiece. Fruit large, finely netted; flesh very melting, and of fine flavour. A very free-setting variety.

Sion House. Fruit medium, oblong; skin clear yellow and well netted; flesh melting, rich, and of delicious flavour.

Sutton's A1. Fruit large, round; skin pale green and handsomely netted; flesh deep, juicy, and of very good flavour.

Triumph. Fruit large and of fine flavour; flesh scarlet, with a band of green under the skin. Frequently green-fleshed fruits are produced on the same plants.

MELON CACTUS. *See* **Melocactus communis.**

MELON PUMPKIN. *See* **Cucurbita Pepo.**

MELOTHRIA (from Melothron, the Greek name for Bryony). ORD. *Cucurbitaceæ.* A genus embracing about twenty-five species of stove, climbing herbs, with simple or bifid tendrils, closely allied to *Zehneria*, and broadly distributed over tropical regions. Flowers white, small, usually monœcious. Fruit indehiscent, globose and acute or fusiform and sub-rostrate. They are usually grown rather for their fruits than their flowers. For culture of the introduced species, *see* **Gourds.**

M. abyssinica (Abyssinian). *fl.* yellowish, very small. *fr.* orange-coloured, round, small, produced in great profusion in autumn. Abyssinia, 1893. Perennial.

M. heterophylla (variable-leaved). The correct name of *Zehneria hastata.*

M. pendula (pendulous). *fl.* yellow, axillary, solitary; females long-pedunculate; corolla slightly hairy. *fr.* ovate-globular, pendent. *l.* petiolate, cordate, with five toothed lobes. North America, 1752. A scabrous-pubescent annual.

M. punctata (dotted). The correct name of *Zehneria suavis.* SYNS. *Z. scabra, Pilogyne suavis.*

MELVILLA. Included under **Cuphea** (which *see*), the correct name of *M. speciosa* being *C. Melvilla.*

MENEGHINIA. A synonym of **Arnebia** (which *see*).

MENIOCUS. Included under **Alyssum** (which *see*).

MENISCIUM. Although the genus *Meniscium* comprises only a comparatively small number of species, these are sufficiently distinct to render it interesting; the majority of them are strong-growing, handsome plants, but one at least amongst them (*M. simplex*) is of such small dimensions that it is frequently used in Fern-cases, a purpose for which it appears particularly well adapted. Nearly all Menisciums have a beautiful venation quite peculiar to them. Being swamp-loving subjects, they are useful for planting in Ferneries near the margin of water, a place where few Ferns grow very satisfactorily. They thrive luxuriantly in a mixture of half loam and half fibrous peat, with a few pieces of crocks or charcoal intermixed. Though their roots, which are of a fleshy and brittle nature, are fond of moisture, they have a great dislike to stagnant water. Menisciums are usually propagated by division of their crowns, but they may also be easily and more rapidly increased by means of their spores, which germinate freely when sown in a warm and moist position.

M. deltigerum (delta-bearing). A synonym of *Acrostichum virens.*

M. reticulatum. Of this species there are a few varieties, including *macrophyllum* (having large pinnæ) and *oligophyllum* (with few pinnæ).

MENISPERMUM. To the species described on p. 352, Vol. II., the following should be added. Several plants formerly classed hereunder are now referred to **Cocculus.**

M. dauricum (Dahurian). *fl.* yellowish-white, in twin, capitellate racemes. June. *l.* peltate, glabrous, cordate, narrowed, smaller than those of *M. canadense*, the angles acute, the terminal one acuminate but scarcely mucronate. *h.* 9ft. Dahuria.

MENODORA (from *menos*, strength, and *doron*, a gift; probably in allusion to some economic quality). SYNS. *Bolivaria, Calyptrospermum.* ORD. *Oleaceæ.* A genus embracing fourteen species of greenhouse herbs or under-shrubs, natives of America and South Africa. Flowers solitary, twin, or in dichotomous panicles.

Menodora—*continued.*

Leaves entire, toothed, or pinnately dissected. *M. trifida* has been introduced, but it is probably no longer in cultivation.

MENTHA. To the information given on p. 352, Vol. II., the following should be added:

M. aquatica (aquatic). According to the "Index Kewensis," this is the correct name of *M. citrata.*

M. gibraltarica. Gibraltar Mint. A form of *M. Pulegium.*

M. punctata (dotted). A synonym of *Preslia cervina.*

MENTUM. A chin. The term is applied to a projection at the foot of the column in some Orchids.

MENTZELIA. *M. gronoviæfolia* is the correct name of *M. bartonioides.* *M. Lindleyi* is the correct name of *Bartonia aurea.*

FIG. 569. MENYANTHES TRIFOLIATA.

MENYANTHES. A number of species formerly included in this genus are now referred to **Limnanthemum** and **Villarsia.** The beautiful little Buckbean, *M. trifoliata* (see Fig. 569), is retained here.

MENZIESIA. To the species described on p. 354, Vol. II., the following should be added:

M. glabella (slightly glabrous). *fl.* lurid purplish, in terminal umbels; corolla ovoid-campanulate. Early summer. *l.* obovate, mostly obtuse, barely mucronate-tipped, 1in. to 2in. long, with some small, appressed hairs above, glaucescent and glabrous or nearly so beneath; margins obscurely serrulated, minutely ciliolate. Rocky Mountains, 1883.

M. globularis is now regarded as a good species, and not as a variety of *M. ferruginea.*

MERATIA. A synonym of **Chimonanthus** (which *see*).

MERENDERA. SYN. *Geophila.* To the information given on p. 354, Vol. II., the following should be added:

M. Bulbocodium. The form *bulbocodioides* has larger flowers and is more robust than the type. 1882.

M. caucasica ruthenica (Russian). *fl.* bright carmine-purple, Crocus-like, appearing before the narrow leaves. Transylvania, 1883. Mr. N. E. Brown regards this as identical with *Bulbocodium ruthenicum,* which is the same as *B. vernum versicolor.*

M. Eichleri is now regarded as a good species, and not as a form of *M. caucasica.*

Merendera—*continued.*

M. sobolifera (shoot-bearing), of gardens. A synonym of *Colchicum procurrens.*

MERIANA (of Trev.). A synonym of **Watsonia** (which *see*).

MERIANA (of Vellozo). A synonym of **Evolvulus** (which *see*).

MERIANIA. Jamaica Rose. *M. leucantha* is the correct name of *M. rosea.*

MERIMEA. A synonym of **Bergia** (which *see*).

MERMAID WEED. *See* **Proserpinaca.**

MERODON EQUESTRIS. *See* **Narcissus Fly.**

MERTENSIA. To the species described on pp. 354-5, Vol. II., the following should be added:

M. oblongifolia (oblong-leaved). *fl.* of a fine blue, with a tube ¼in. long, disposed in rather close clusters. Spring and summer. *l.* mostly oblong or spathulate-lanceolate, rather succulent, deep green. Stems 6in. to 9in. high. North America (on moist slopes).

M. pulmonarioides (Pulmonaria-like). According to the "Index Kewensis," this is the correct name of *M. virginica.*

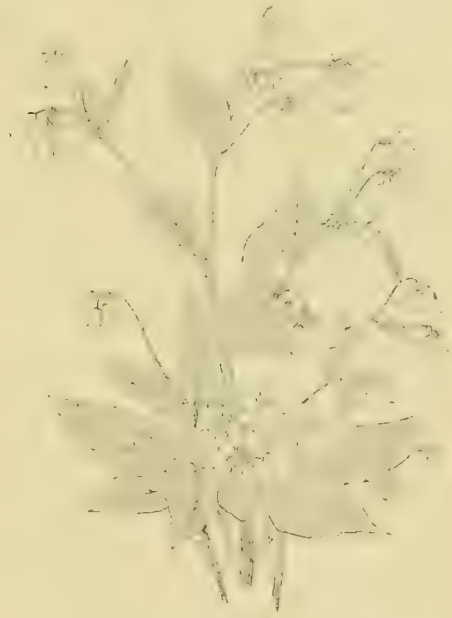


FIG. 570. MERTENSIA SIBIRICA.

M. sibirica atrocærulea (dark blue). A dark blue variety, taller than the type. The typical plant is shown at Fig. 570.

MESECHITES. A synonym of **Echites** (which *see*).

MESEMBRYANTHEMUM. To the species described on pp. 355-60, Vol. II., the following should be added:

M. abbreviatum (shortened). *l.* 2in. long, ¼in. thick, acutely triquetrous, acute or slightly mucronulate. Stems thick, short, prostrate, clustered; internodes short. 1825. (M. A. S., § 19, f. 5.)

M. æquilaterale (equilateral). According to the "Index Kewensis," this is the correct name of *M. Rossii*; the latter, however, is often regarded as a distinct species.

M. amœnum (pleasing). *fl.* purplish, with white filaments; petals ¼in. long; peduncles 8in. to 12in. long. *l.* crowded, green, incurved, erect, 1in. to 1½in. long, cylindrically triquetrous, bluntish, mucronulate. Branches sub-erect. Undershrub.

M. bellidiflorum (Daisy-flowered). The correct name of *M. subulatum.*

M. Brownii (Brown's).* *fl.* at first brilliant lustrous purple, fading into ochreous or reddish-yellow, 1in. to 1¼in. in diameter, solitary or in threes at the ends of the branches; calyx tube short, turbinate; petals in several series, very narrowly spathulate, the lip obtuse, retuse, or notched. July. *l.* six to

Mesembryanthemum—*continued.*

eight lines long, terete, acute, pale glaucous-green; youngest ones obscurely triquetrous or semi-terete. Branches slender. *h.* 1ft. South Africa. (B. M. 6985.) SYN. *M. micans* (of gardens). A showy species.

M. candens alba. A white variety of the type. There is also a pink one—*rosea.*

M. capitatum (headed).* *fl.* yellow, large; calyx urceolate, the lobes slightly longer than the attenuated petals. Summer. *l.* crowded, equilaterally triquetrous, 5in. to 7in. long, only ¼in. broad, glaucescent, purplish and larger at base. Stem suffruticose, simple or branched. *h.* 4in. to 6in. South Africa.

M. Ecklonis (Ecklon's). *fl.* white, ½in. across, somewhat trichotomous, usually ternate or biternate. September and October. *l.* almost connate, depressed-triquetrous, six to ten lines long, spreading-recurved, mucronulate. Stem and branches pubescent, at length glabrate. Root woody. *h.* 1½ft. Plant branched from the base. (M. A. S., § 49, f. 5.)

M. falcatum (sickle-shaped). *fl.* pink, small, ternate; peduncles 1½in. to 2in. long. July. *l.* ½in. long, crowded, somewhat triquetrous-compressed, sub-falcate, pellucid-dotted. Stem suffruticose, much-branched; branches filiform. 1805.

M. ficiforme (Fig-like). Plant stemless, obpyramidal or Pear-shaped, pale glaucous, 1in. high, retuse and obtuse at apex, often distinctly green-dotted. 1819. This is often miscalled *M. nuciforme* in gardens.

M. hirtum is a form of *M. polyanthon.* An excellent plant for sunny rockeries and hot, dry banks.

M. intonsum (unshorn). The correct name of *M. introrsum.*

M. lepidum (neat). *fl.* white, showy, longer than the peduncles; calyx lobes acuminate. *l.* somewhat recurved at apex, slightly mucronate. Branches and branchlets numerous, erect. *h.* 2ft. An erect, slender sub-shrub.

M. micans (glittering), of gardens. A synonym of *M. Brownii.*

M. mucronatum (mucronate). *fl.* pink. *l.* ½in. long, oblong-ovate, triquetrous at apex, connate at base, glaucescent, ending in a white mucro. Stem sub-shrubby, 1in. to 2in. long, erect, much-branched. 1794.

M. nuciforme (nut-like), of Haworth. A synonym of *M. minutum.* In gardens this name is also often erroneously applied to *M. ficiforme.*

M. productum (produced). *fl.* pale pink, showy, bigeminate or ternate; calyx lobes unequal; petals lanceolate. November. *l.* crowded, sub-distichous, 1in. to 1½in. long, semi-terete, erect-incurved, glaucous, smooth, mucronulate. Stem 1in. to 2in. high; branches erect. 1822.

M. roseum (rosy). *fl.* pale rose, ternate or twin, showy; petals ¾in. long, in two series; peduncle about 2in. long. July. *l.* 1½in. long, ¼in. broad, incurved, glaucous, compressed-triquetrous, mucronulate, dotted. Stem 1½ft. to 2ft. high; branches spreading, leafy. 1795. Under-shrub.

M. serrulatum (slightly serrated). The correct spelling of *M. serratulum.*

M. tricolor (three-coloured), of gardens. A synonym of *M. tricolorum.*

M. tricolorum album (white). A pretty variety, having white, Daisy-like flowers with purple centres. 3in. Annual.

MESOCHIL. In Orchids with a lip divided into three portions, the central division is called the Mesochil. *See* **Epichil** and **Hypochil.**

MESOSPINIDIUM. *See also* **Cochlioda.**

MESPILUS. *M. Smithii* (SYN. *M. grandiflora*) is now regarded by some botanists as *Cratægus grandiflora.*

MESSERSCHMIDIA. Included under **Tournefortia** (which *see*).

METACHILUM. A synonym of **Appendicula** (which *see*).

METALASIA (from *meta*, on the other side, and *lasios*, hairy; some of the species have the leaves woolly beneath). Including *Erythropogon.* ORD. *Compositæ.* A genus embracing about twenty species of small, erect or spreading, greenhouse shrubs, endemic in South Africa. Flower-heads cylindrical or turbinate, rarely solitary, mostly corymbose or fascicled; florets purple or whitish. Leaves alternate, sessile, linear or oblong. About ten of the species have been introduced, but it is doubtful if any of them are still cultivated.

METEORIC. A term applied to flowers which open or close owing to atmospheric influences.

METHYSCOPHYLLUM. A synonym of **Catha** (which *see*).

METROSIDEROS. To the species described on p. 361, Vol. II., the following variety should be added. Several species formerly included hereunder are now referred to **Callistemon.**

Metrosideros—*continued.*

FIG. 571. METROSIDEROS FLORIBUNDA.

M. floribunda. A trade name for *Callistemon lanceolatus.* See Fig. 571.

M. f. alba (abundant-flowered, white). *fl.* pure white. 1835.

METROXYLON. In addition to the species described on p. 361, Vol. II., *M. amicarum*, a native of the Friendly Isles, is grown at Kew, but it is not in general cultivation.

M. elatum (tall), of gardens. A synonym of **Heterospathe elata** (which *see*).

M. elatum (of Martius). A synonym of *Pigafetta elata.*

METROXYLON (of Sprengel). A synonym of **Raphia** (which *see*).

MEXICAN LILY. *See* **Hippeastrum Reginæ.**

MEXICAN POPPY. *See* **Argemone.**

MEYNIA (of Roxburgh). A synonym of **Vangueria** (which *see*).

MEZEREUM. Included under **Daphne** (which *see*).

MICHAUXIA. SYN. *Mindium.* To the species described on p. 362, Vol. II., the following should be added:

M. Tchihatcheffi (Tchihatcheff's).* *fl.* white, Campanula-like, very numerous, sub-sessile; spike 2ft. or more in length. June and July. *l.* toothed; lower ones broadly oblong, undivided or lobed at base; cauline ones oblong and ovate, amplexicaul. *h.* 6ft. to 7ft. Orient, 1896. A very handsome annual or biennial. (B. M. 7742; G. C. 1897, i., p. 55, f. 53.)

MICHAUXIA (of Necker). A synonym of **Relhania** (which *see*).

MICHELIA. *M. fuscata* is the correct name of *Magnolia fuscata.*

MICONIA. Cyanophyllum (which *see*) is included hereunder by the authors of the "Genera Plantarum." To the species described on p. 362, Vol. II., the following should be added:

M. staminea (full of stamens). The correct name of *M. Teysmanniana.*

M. velutina (velvety). *l.* ample, opposite, petiolate, ovate, acute, with three to five prominent nerves, entire, of a beautiful dark green, velvety, and zoned with white above; lower surface purplish-red; petioles red. Stems reddish-brown. Brazil, 1894. According to Rodigas, this is a variety of *M.* (*Cyanophyllum*) *magnifica.*

M. vesicaria (bladder-like). *l.* opposite, ovate, petiolate, hairy, about 6in. long, deep green, shaded with violet. Peru, 1895.

MICRANTHERA. A synonym of **Tovomita** (which *see*), the correct name of *M. clusiæfolia* being *T. Choisyana.*

MICRANTHUS (from *mikros*, small, and *anthos*, a flower; in allusion to the size of the blossoms). ORD. *Irideæ.* A small genus (two species) of greenhouse plants with tunicated corms, natives of South Africa. Flowers

Micranthus—*continued.*

red, small, in dense, distichous spikes; perianth tube short, curved, the segments spreading, obtuse; stamens inserted at the throat, unilateral. Leaves sheathing, superposed. For culture, *see* **Watsonia.**

M. fistulosus (fistular). *fl.* as in *M. plantagineus*. *l.* lorate, glabrous, the largest 3in. to 6in. long. SYNS. *Ixia fistulosa* (B. M. 523), *Watsonia fistulosa.*

M. plantagineus (Plantain-like). *fl.* in spikes 3in. to 6in. long, the lower blossoms often abortive or replaced by bulbils. June. *l.* about three, linear, strongly ribbed, the largest 6in. to 12in. long. Stem 6in. to 12in. long, simple or branched. 1774. SYNS. *Watsonia compacta* (L. B. C. 1577), *W. plantaginea* (B. M. 553).

MICRANTHUS (of Wendland). A synonym of **Phaylopsis** (which *see*).

MICRO-. A prefix signifying small; *e.g.*, Microphyllous, having small leaves.

MICROCHILUS. A synonym of **Physurus** (which *see*).

MICROCOCCUS AMYLOVORUS. *See* **Pear—Fungi,** Vol. III.; and **Canker,** Vol. V.

MICROCYCAS (from *mikros*, small, and *Cycas*; in allusion to the relative size and affinity of the plant). ORD. *Cycadaceæ*. A monotypic genus. The species, *M. calocoma*, is the plant described on p. 236, Vol. IV., as **Zamia calocoma** (which *see*); it is a native of Cuba.

MICRODON (from *mikros*, small, and *odous*, *odontos*, a tooth). SYN. *Dalea* (of Gærtner). ORD. *Selaginæ*. A genus embracing four or five species of small, greenhouse, South African shrubs, closely allied to *Selago*. Flowers in dense or interrupted spikes. Leaves entire; cauline ones linear. One or two of the species (which were formerly classed under *Selago*) have been introduced, but they are not generally cultivated.

MICROGENETES. A synonym of **Phacelia** (which *see*).

MICROGYNE. A synonym of **Vittadinia** (which *see*).

MICROLEPIDOPTERA. *See* **Moths.**

MICROMELES. Included under **Pyrus** (which *see*).

MICROMERIA. The following species are good rockery plants, thriving best in a sandy loam. Being small they may be inserted in narrow chinks.

M. croatica (Croatian). *fl.* of a pale rose-violet; corolla twice as long as the calyx; cymes depauperated, forming a contracted panicle. Summer. *l.* sub-sessile, entire, ¼in. long, rounded-ovate. Stems numerous, 3in. to 6in. long, nearly erect. Rhizome densely branched. Croatia.

M. græca (Grecian). *fl.* pink; cymes axillary, shortly pedunculate, three- to seven-flowered, secund. June. *l.* sessile, firm, sweet-scented; lower ones ovate or ovate-oblong; upper ones lanceolate or linear. Branches ascending or erect. *h.* 9in. Orient, &c. A much-branched, pubescent, under-shrub. (S. F. G. vi., t. 542.)

M. Juliana (Julian's). *fl.* pale red, extremely minute. *l.* sessile, nearly all ovate; upper and floral ones narrower, scarcely exceeding the whorls; all obtuse, revolute-margined. Branches erect, pubescent (or in var. *hirsuta* hairy), 6in. to 12in. or more in length. Mediterranean region. Shrub.

M. rupestris (rock-loving). *fl.* white or purple; cymes shortly pedunculate, clustered, many-flowered. June. *l.* petiolate, ovate or oblong, ¼in. to ½in. or more in length (under cultivation). Stems from a woody base, 1ft. to 1½ft. long, ascending. South Europe, &c. SYN. *Satureia rupestris.*

MICROPERA. Included under **Sarcochilus** (which *see*).

MICROPETALON. Included under **Stellaria** (which *see*).

MICROPHŒNIX (from *mikros*, small, and *Phœnix*; in allusion to the habit of the plants, and their affinity to *Phœnix*). ORD. *Palmæ*. The two following hybrids are the only plants that have been described under this name. They will probably thrive under the treatment recommended for **Phœnix** (which *see*).

M. decipiens (deceptive). According to Carrière, this name was given by Naudin to a hybrid, obtained by a horticulturist at Hyères, between the common Date Palm (*Phœnix dactylifera*) and the dwarf Fan Palm (*Chamærops humilis*).

M. Sahuti (Sahut's). *fr.* reddish-brown, about ¾in. long, ellipsoid, with rounded angles. 1885. A garden hybrid between *M. decipiens* and *Trachycarpus excelsus*, having the habit and foliage of the former, and the violet-tinted petioles and fruits of the latter. (R. H. 1885, p. 513, f. 91.)

MICROPIPER. Included under **Peperomia** (which *see*).

MICROSERIS (from *mikros*, small, and *Seris*, Endive or Lettuce; "not an apposite name for our larger species"—Asa Gray). SYNS. *Bellardia*, *Calais*, *Lepidonema*, *Uropappus*. ORD. *Compositæ*. About a dozen species of this genus are known; they are greenhouse or hardy, annual or perennial herbs, one being found in South America, another in New Zealand and Australia, and the rest in North-west America. *M. Lindleyi*, a hardy annual with yellow flower-heads, has been introduced, but is probably not now in cultivation.

MICROSPHÆRA BERBERIDIS. *See* **Mildew,** Vol. II.

MICROSPHÆRA GROSSULARIÆ. *See* **Gooseberry Fungi.**

MICROSTYLIS. To the species described on p. 364, Vol. II., the following should be added:

M. bella (pretty). A synonym of *M. plantaginea*.

M. congesta (crowded). *fl.* yellowish-green, small, crowded in a compact, cylindrical raceme 3in. to 6in. long; scape erect, 6in. to 12in. long. *l.* lanceolate, acuminate, 4in. to 6in. long. Stem thick, 3in. long. India, &c. An unattractive species.

M. c. fusca (fuscous). *fl.* purple, more densely congested than in the type. 1882. SYN. *M. trilobulata.*

M. Lowi (Low's).* *fl.* purple, the ears of the sagittate lip ochreous; peduncle rosy-purple. *l.* of a dark coppery-brown, marked with a broad, whitish, central band, the margins undulated. Borneo, 1885. A beautiful little plant. (B. H. 1884, t. 14, f. 2.)

M. macrochila (large-lipped). *fl.* very large for the genus; lip ½in. wide; scape 8in. long. *l.* almost identical with those of *M. Scottii*, being light brown, with a marginal band of light yellow. Malaya, 1895. (G. C. 1895, xviii., p. 325, f. 60.)

M. plantaginea (Plantain-like). *fl.* dull purple, disposed in an elongated raceme; sepals and petals linear-ligulate; lip long, sagittate, sub-equally toothed at apex. *l.* ample, cuneate-oblong, acute, undulated. Pseudo-bulbs conical-cylindrical. Sunda Islands, 1835. SYN. *M. bella* (I. H. 1885, 581).

M. purpurea (purple).* *fl.* yellowish-purple. *l.* broadly ovate, 4in. to 5in. long, 2in. broad or more, much undulated, the upper surface dark metallic-crimson, the under-surface and petioles pale metallic reddish-grey. Ceylon. A fine species.

M. Scottii (Scott's)* *fl.* green and purple, numerous, small; scape 6in. high. *l.* very ornamental, ovate, acuminate, 5in. long, plaited, light bronze, the margins yellow, spotted with brown; under-side greenish-yellow, veined with purple and spotted with green. Stems fleshy. Malay Peninsula, 1892. (B. M. 7268.)

M. trilobulata (three-lobuled). A synonym of *M. congesta fusca.*

MIDNAPORE CREEPER. *See* **Rivea hypocrateriformis.**

MIEGIA. A synonym of **Arundinaria** (which *see*).

MIERIA. A synonym of **Schkuhria** (which *see*).

MIGNONETTE. Many additional varieties have been placed upon the market of recent years, the best being: Bush Hill White, Covent Garden Favourite, Garaway's Double White, Golden Gem, Pyramidalis Grandiflora, and Victoria Crimson Improved.

MIKANIA. To the species described on p. 365, Vol. II., the following should be added:

M. amara (bitter). The correct name of *M. Guaco.*

M. Sanderi (Sander's). *fl.* unknown in cultivation. *l.* opposite, in pairs, 6in. to 8in. long, 4in. to 5in. broad, ovate, bright green down the centre, deep bronzy or purplish-green towards the margins, veined with pale green or whitish. Stems slender, purple. 1893. A tall-growing, stove climber.

M. senecioides (Senecio-like). A garden synonym of *Senecio mikanioides.*

MILDEW. For combating the diseases which are popularly known under this heading, and which are very numerous, sulphur in some form still remains one of the most useful of fungicides. The most approved preparation of it is sulphide of potassium. Even more efficacious, but less generally useful, is the Bordeaux Mixture. This latter cannot, however, well be used upon plants under glass, as a rule, on account of the somewhat disfiguring effects it has upon them. Of its utility there can be no doubt. *See* **Fungicides.**

MILKWEED. A common name for species of *Asclepias.*

MILKWORT. *See* **Polygala.**

FIG. 572. MILTONIA ROEZLII AND M. R. ALBA.

MILLA. A few species formerly classed under this genus are now referred to **Brodiæa, Calliprora, Nothoscordum,** and **Triteleia.**

M. macrostemon (large-stamened). The correct name of *Nothoscordum macrostemon.*

MILLET GRASS. *See* **Paspalum** and **Sorghum.**

MILLETTIA. *M. japonica* is now regarded as the correct name for *Wistaria japonica.*

MILTONIA. The three Miltonias which find most favour with Orchid specialists are *M. vexillaria, M. Roezlii* (see Fig. 572), and *M. spectabilis.* To flower these satisfactorily, three different systems or conditions of culture are absolutely necessary. *M. vexillaria* will do well in the Odontoglossum-house during the summer months of the year, but as soon as the cool autumn nights return, it should be removed to warmer quarters where it can obtain an even temperature of 55deg. The best season in which to pot the plants is in spring, just as new growth is commencing to form the bulb, and the flower-spikes make their appearance in the axils of the leaves. This is the season at which they commence to root from the base of the developing growth, and as the roots are emitted rapidly, they quickly establish themselves in their new quarters. They should be freely watered with soft rain-water as soon as the potting has been done, and should be kept in a fairly moist condition at the roots until the flowering season is over, after which they should be allowed to become comparatively dry. Only sufficient moisture is required to keep the bulbs plump until the young growths get well away from the base of the old bulb. After they attain some 3in. or 4in. in length, the plants may be more liberally treated.

M. Roezlii and its variety *alba* require a high and humid temperature, which should never be less than 60deg. in winter. They do best when plunged to the rim of the pots in living sphagnum; this assures a desirable moist condition constantly about the plants. The best season to re-pot *M. Roezlii* is when the new roots are being emitted from the base of the developing growths.

Miltonia—*continued.*

M. spectabilis, in its varied forms, is best grown in baskets or shallow well-drained pans. They require an abundance of light and warm intermediate house treatment during the growing season. A position near the roof-glass of the Cattleya-house suits them admirably during the summer months. As soon as the flowers have been removed and the bulb is properly developed, cooler and drier conditions should be maintained.

The potting compost required for each section is a mixture of good fibrous peat and living sphagnum in equal portions. The drainage should be clean and ample.

To the species and varieties described on pp. 367-70, Vol. II., the following should be added:

M. bicolor (two-coloured). A variety of *M. spectabilis.*

M. cereola (slightly waxy). A synonym of *M. Regnelli.*

M. Moreliana (Morel's). A variety of *M. spectabilis.*

M. pulchella (rather pretty). A synonym of *M. Phalænopsis.*

M. Schrœderiana (Baron Schrœder's). *fl.* fragrant, 2½in. across; sepals and petals chestnut-brown, tipped and marked with light yellow, with revolute margins; lip rose-purple at base, milk-white at apex, sub-panduriate; scapes erect, racemose, seven- to nine-flowered. January. *l.* linear-oblong, 5in. to 7in. long. Pseudo-bulbs ovoid-oblong, two-leaved. Central America. SYN. *Odontoglossum Schrœderianum* (R. ii., t. 96; W. O. A. viii., t. 382).

M. speciosa (showy). A synonym of *M. cuneata.*

M. spectabilis Moreliana atrorubens (dark red). *fl.* much

FIG. 573. MILTONIA VEXILLARIA.

Miltonia—*continued.*

darker than in *Moreliana*, often measuring 4in. across. September. Brazil. A scarce plant.

M. stellata (star-like). A synonym of *M. flavescens.*

M. vexillaria alba (white).* A beautiful, white-flowered variety. 1885. SYN. *Odontoglossum vexillarium album* (W. O. A., t. 227). The typical plant is shown at Fig. 573.

M. v. Cobbiana (Cobb's). *fl.*, upper portion of the usual deep rose-pink, the large, expanded wings of a pure white. 1882.

M. v. leucoglossa (white-lipped). *fl.*, sepals and petals pale rose; lip pure white. Colombia. A striking variety.

M. v. Measuresiana (Measures'). *fl.* of a purer white and smaller than those of the variety *alba.* 1885.

M. v. rubella (reddish). *fl.* bright rose, with three crimson lines at the base of the lip. *l.* broader than usual. Pseudobulbs more blunt than in the type. 1882.

M. v. superba (superb). *fl.*, sepals and petals rose, the former having a purplish-crimson stripe at base; lip magenta-rose, the white area at the base having a large, dark crimson-purple blotch veined with darker, radiating lines. Autumn. Colombia. SYN. *Odontoglossum vexillarium superbum* (W. O. A. iv., t. 171).

M. Warscewiczii ætheria (ethereal). *fl.*, sepals and petals very light, with white tips; lip white, having a light yellow area bordered and based with very light mauve-lilac. 1881. A curious variety.

M. W. alba (white). *fl.* having a broad, white lip, marked in the centre with a conspicuous, lilac blotch. 1882.

M. W. xanthina (yellowish). *fl.* almost wholly yellow, the lip having a narrow, white border. Winter. Peru.

Hybrids.

NAME.	PARENTAGE AND RAISER.
Bleuana	*vexillaria* and *Roezlii* (Bleu and Veitch).
Bleuana nobilior	*vexillaria* and *Roezlii* (Bleu).
Bleuana virginalis	*vexillaria* and *Roezlii* (Bleu).

Natural Hybrids.

NAME.	PARENTAGE.
Binoti	*candida* and *Regnelli.*
Bluntii	*spectabilis* and *Clowesi.*
Bluntii Lubbersiana	*spectabilis* and *Clowesi.*
Bluntii Peetersiana	*spectabilis Moreliana* and *Clowesi.*
festiva	*spectabilis* and *flavescens.*
Joiceyana	Syn. *Lamarckiana.*
Lamarckiana	*Clowesi* and *candida.*
leucoglossa	*bicolor* and (unrecorded).

MIMICRY. A resemblance which certain plants bear to other plants, animals, or even to their environment. In a state of nature it doubtless acts as a protection against enemies. It is also known as Protective Resemblance.

MIMOSA. Several species formerly included hereunder are now referred to **Acacia, Albizzia, Calliandra,** and **Stryphnodendron.** To those described on p. 370, Vol. II., the following should be added:

M. argentea. Brazil. Stove climber.

M. Spegazinii (Spegazini's). *fl.* in globose heads, forming terminal racemes; stamens pale violet. *fr.*, pods three- or four-seeded, prickly. *l.* having but one pair of pinnæ, bearing numerous leaflets, and armed with prickles at the base. Argentina, 1892. Greenhouse shrub.

M. stricta (erect). A synonym of *Acacia stricta.*

MIMULUS. To the species described on pp. 370-1, Vol. II., the following should be added:

M. Clevelandi (Cleveland's). *fl.* golden-yellow, in a terminal spike; corolla 1¼in. long; peduncles short. *l.* lanceolate, glandular-pubescent (as is the whole plant). Stems suffruticose. Southern California, 1895. Greenhouse. (G. & F. 1895, i., p. 134, f. 20; G. C. 1895, i., p. 518.)

M. luteus alpinus (alpine). A name applied by Asa Gray to a series of mountain varieties, from 2in. to 12in. high, all perennials and large-flowered, including *Roezlii* and *Tilingii* (R. G. xviii., t. 631).

M. maculosus (spotted). *See* **M. luteus cupreus.**

M. mohavensis (Mohave River).* *fl.*, calyx tube ⅓in. long; corolla whitish, with a dark crimson eye, the stout tube scarcely longer than the calyx, the limb much spreading, ½in. in diameter. Summer. *l.* oblong-lanceolate, acute, entire, reddish. *h.* 2in. to 3in. California, 1885. A pretty little, minutely viscous-pubescent, hardy annual.

M. moschatus Harrisonii (Harrison's).* A variety having very large flowers.

M. perfoliatus (perfoliate). A synonym of *Leucocarpus alatus.*

Mimulus—*continued.*

M. Roezlii (Roezl's). A form of *M. luteus alpinus.*

M. Tilingii (Tiling's). A form of *M. luteus alpinus.*

M. tomentosus (downy). This is closely allied to *M. glutinosus*, but the leaves are white-woolly beneath. California, 1897. Greenhouse.

Varieties. Besides the species and varieties already noted, there are a host of names of garden origin. The more noteworthy are: Cloth of Gold, Duplex, Fire King, Gloriosus, Grandiflorus Brilliant, Prince Bismarck, and Ruber.

MINA LOBATA. A synonym of **Ipomœa versicolor** (which *see*).

MINDIUM. A synonym of **Michauxia** (which *see*).

MINT, MOUNTAIN. *See* **Pycnanthemum.**

MINT-BUSH or MINT-TREE, AUSTRALIAN. *See* **Prostanthera.**

MINT RUST (*Puccinia Menthæ*). This is dealt with under **Puccinia,** in Vol. III.

MINUARTIA. Included under **Arenaria** (which *see*).

MIQUELIA (of Blume). A synonym of **Stauranthera** (which *see*).

MIRABILIS. To the species described on p. 372, Vol. II., the following should be added:

M. hybrida (hybrid). *fl.* white, sessile, congested; perianth tube glabrous or pubescent, the limb spreading. July. *l.* ovate-cordate, very shortly petiolate, acuminate, sinuate-margined, sometimes truncate at base. *h.* 2ft. 1813. A hybrid, probably between *M. Jalapa* and *M. longiflora.*

MIRACULOUS BERRY. *See* **Sideroxylum dulcificum.**

MIRBELIA BAXTERI. A synonym of **Oxylobium scandens** (which *see*).

MISCANTHUS. *M. sinensis* (B. M. 7308) is the correct name of **Eulalia japonica** (which *see*), and *E. gracillima* (frequently catalogued as *Eulalia gracillima univittata*, *E. japonica gracillima*, &c.) is a variety of it.

MISCHANTHUS. *See* **Miscanthus.**

MISCOPETALUM. Included under **Saxifraga** (which *see*).

MISTLETOE CACTUS. *See* **Rhipsalis.**

MITOPETALUM. A synonym of **Tainia** (which *see*).

MITRASTIGMA. A synonym of **Plectronia** (which *see*).

MITREWORT, FALSE. *See* **Tiarella.**

MOCK ORANGE. *See* **Philadelphus coronarius.**

MOCK PRIVET. *See* **Phillyrea.**

MOHRIA. Frankincense Fern. *M. caffrorum* is of very easy culture: all that it requires in the way of soil is a mixture of about equal parts peat, leaf-mould, and sand, with the addition of small pieces of sandstone or soft brick-dust. Syringing overhead must be carefully avoided, or it will cause the fronds to turn brown and decay in a short time. The plant is essentially a greenhouse subject, and should receive all the light possible. Propagation is readily effected from spores, which are abundantly produced, and which germinate very freely, producing young subjects in a remarkably short space of time.

MOIST STOVE. A Stove-house containing plants requiring plenty of atmospheric moisture for their proper development—such as Nepenthes, &c.

MOLDENHAWERA (commemorative of I. J. Moldenhawer, a German botanist). SYN. *Dolichonema.* ORD. *Leguminosæ.* A small genus (two or three species) of stove, unarmed, South American trees. Flowers racemose. Leaves either bipinnate or impari-pinnate. *M. floribunda* has been introduced, but is probably not now in general cultivation.

MOLINA (of Cavanilles). A synonym of **Hiptage** (which *see*).

MOLINA (of Ruiz and Pavon). A synonym of **Baccharis** (which *see*).

MOLINIA. *M. Bertini* is a seedling variegated form of *M. cærulea*, introduced in 1890.

MOLLIA (of Willdenow). A synonym of **Polycarpæa** (which *see*).

MOLTKIA GRAMINIFOLIA. A synonym of **Lithospermum graminifolium** (which *see*).

MOLUCCELLA. To the species described on p. 376, Vol. II., the following should be added:

M. spinosa (spiny). *fl.* six to ten in a whorl; corolla whitish, the limb exceeding the calyx, the limb of which is 1in. long, very obliquely bilabiate and seven-spined; bracts subulate-spiny. *l.* petiolate, ovate, deeply incised-lobed. Stems erect, tall, quadrangular, sulcate, simple or slightly branched. Orient. SYN. *Chasmonia incisa* (B. R. xii., t. 1244).

MOMORDICA. To the species described on pp. 376-7, Vol. II., the following should be added:

M. chinensis (Chinese). This differs from *M. Charantia* only in its much larger and longer fruits, which are of a silvery colour. China, 1893.

M. involucrata (involucred).* *fl.*, males pale yellowish, with three green spots on the short tube, solitary in the upper axils; females few, with revolute lobes; bracts of peduncle adjacent to the calyx, resembling an involucre. July. *fr.* scarlet, fleshy, 2in. long. *l.* 1½in. to 2in. in diameter, five-lobed, the lobes toothed; petioles slender, ¼in. to 1in. long. Natal, 1862. A graceful climber. (B. M. 6932; Ref. B. iv. 223.)

M. martinicensis (Martinique). A very quick-growing, much-branched plant resembling *M. Charantia*, with ornamental fruit. Habitat not recorded, 1883.

M. muricata (pointed). *fl.* pale yellow. *fr.* golden or orange-yellow, with blood-red pulp and white seeds. Peru, 1893. A vigorous species.

MOMORDICA (of Pœppig and Endlicher). A synonym of **Cyclanthera** (which *see*).

MONANTHES POLYPHYLLA. The correct name of **Sempervivum Monanthes** (which *see*).

MONARDA. This genus includes some of the finest of hardy perennials, amongst them the Bergamot (*M. didyma*), besides white (*alba*), blush (*carnea*), and other forms of the almost equally well-known *M. fistulosa*. The Bergamot, apart from its brilliant scarlet flowers, has fragrant foliage.

MONELLA. A synonym of **Cyrtanthus** (which *see*).

MONESES UNIFLORA. The correct name is *M. grandiflora*.

MONETIA. A synonym of **Azima** (which *see*).

MONILIA FRUCTIGENA. *See* **Brown Rot of Fruit.**

MONIZIA. Included under **Thapsia** (which *see*).

MONKEY BREAD. *See* **Adansonia.**

MONKEY NUT. *See* **Arachis hypogæa.**

MONKEY'S COMB. *See* **Pithecoctenium.**

MONKEY'S EARRING. *See* **Pithecolobium.**

MONK'S-COWL ORCHID. *See* **Pterygodium.**

MONK'S PEPPER-TREE. *See* **Vitex Agnus-castus.**

MONO-. In Greek compound words, this prefix signifies "one" or "once"; *e.g.*, Monocarpic, bearing fruit only once.

MONOBOTHRIUM. A synonym of **Swertia** (which *see*).

MONOCHILUS (of Wallich). This is now included under **Zeuxina** (which *see*).

MONOCHLAMYDEÆ. A sub-class of Dicotyledons or Exogens.

MONOCHORIA. *M. hastæfolia* is the correct name of *M. hastata*.

MONODORA. To the species described on p. 379, Vol. II., the following should be added:

M. grandiflora (large-flowered). *fl.* yellow, irregularly spotted with red, drooping, more than double the size of those of *M. Myristica*; outer petals 3in. to 4in. long, crisped-undulated, the inner ones much smaller. May. *l.* oblong or obovate-oblong, acute, rounded, obtuse, or cordate at base; young ones glossy, rose-purple. Western tropical Africa, 1860. (B. M. 7260.)

MONOGRAMME. Rush Ferns. Including *Vaginularia*. Though none of the species contained in this genus are of much decorative value, yet they are interesting from a botanical point of view, and three or four of the strongest growers may even be used with advantage for planting in warm Fern-cases. All require stove treatment, and need a very light peaty material to grow in. Propagation is easily effected by division of the rhizomes (prostrate stems), which are usually of a slender, wide-creeping nature.

MONOGYNELLA. A synonym of **Cuscuta** (which *see*).

MONOPANAX. According to the "Index Kewensis," *M. Ghiesbreghtii* is identical with **Oreopanax xalapense** (which *see*).

MONOPYLE (from *monos*, single, and *pyle*, a door; in allusion to the capsule opening by one dorsal slit). ORD. *Gesneraceæ*. A small genus (five or six species) of stove, scabrous-pubescent herbs, closely allied to *Gloxinia*, but slenderer, and with the corolla nearly regular. For culture of *M. racemosa*, the only species calling for description, *see* **Gloxinia.**

M. racemosa (racemose). *fl.* white, obscurely spotted within; corolla 1in. long, ⅜in. across, the tube slightly curved, the two lower of the five spreading lobes toothed; racemes stout, terminal, bracteate. July. *l.* bright green, opposite, petiolate, ovate-lanceolate, acuminate, serrulate; petioles purplish, with a purple-centred green blotch at the swollen base. Colombia, 1875. (B. M. 6233.)

MONOTYPIC GENUS. A genus formed of a single species.

MONOXORA. A synonym of **Rhodamnia** (which *see*).

MONSTERA. To the species described on p. 380, Vol. II., the following should be added:

M. acuminata (taper-pointed). Shingle Plant. *l.* rather thick, cordate-ovate or oblong-cordate-ovate, shortly acuminate, 8in. to 10in. long, very unequal-sided, paler beneath; petioles 3in. to 5in. long, with a broad, membranous margin. Tropical America. SYNS. *M. tenuis, Marcgravia paradoxa* (of trade catalogues).

M. pertusa (perforated). The correct name of *M. Adansonii*.

M. tenuis (slender). A synonym of *M. acuminata*.

MONTBRETIA AUREA. A synonym of **Crocosmia aurea** (which *see*).

MONTEREY PINE. *See* **Pinus insignis.**

MONTHLY ROSE. *See* **Rosa indica.**

MOON CREEPER. *See* **Ipomœa Bona-nox.**

MOONFLOWER. This in some countries is applied to species of *Ipomœa*.

MOON TREFOIL. *See* **Medicago arborea.**

MOOREA (named in honour of F. W. Moore, Curator of the Royal Botanic Garden at Glasnevin, near Dublin). ORD. *Orchideæ*. A monotypic genus. The species is a stove, epiphytal Orchid, allied to **Houlletia** (which *see* for culture), but differing in the lip being without a claw and articulated with the foot of the column, and in the epichil not being articulated with the hypochil.

M. irrorata (bedewed). *fl.* 2in. in diameter; sepals and petals reddish-brown, with a nearly white base, the lateral sepals carinate; lip straw-yellow, with radiating purple lines, deeply three-lobed; column creamy-white; raceme thirteen-flowered; scapes erect, 1¾ft. high. *l.* lanceolate, 1¼ft. to 2ft. long. Pseudo-bulbs 2½in. long, two-leaved. South America, 1890. (B. M. 7262; G. C. 1892, xi., p. 483.)

MOP-HEADED. A term applied to trees having no leader, and bearing a very great number of small branches; it is also appropriately applied to the abnormally large blossoms of Chrysanthemums at present in favour.

MOQUILEA. *Leptobalanus* is synonymous with this genus.

MORÆA. Including *Dietes*. According to J. G. Baker's "Handbook of *Irideæ*," this genus embraces nearly sixty species; he says, "The line of demarcation between *Iris* and *Morœa* has been drawn in different places by different authorities. Here I have followed Bentham, with whom *Iris* belongs entirely to the North Temperate zone, and *Morœa* to the Cape and tropical Africa, with one species (*M. Robinsoniana*) Australian."

Moræa—*continued.*

To the species, &c., described on pp. 381-2, Vol. II., the following should be added. A number of plants formerly included here are now classed under **Aristea, Eleutherine, Hexaglottis, Homeria, Lapeyrousia, Libertia, Marica, Pardanthus, Sisyrinchium, Sparaxis, Tigridia,** &c.

M. barbigera (beard-bearing). A form of *M. ciliata.*

M. ciliata (ciliated). *fl.* lilac with a yellow eye, or yellow, fugitive; blade of the falls ¾in. broad; spathe single. September. *l.*, basal ones three to five, spreading, lanceolate, acuminate, finely pubescent, 4in. to 5in. long. *h.* 4in. to 6in. 1587. (B. M. 1061.)

M. c. barbigera (beard-bearing). *fl.* bright red, with yellow falls, finely pilose at the throat of the blade and on the claw. 1587. SYNS. *M. barbigera* (B. M. 1012), *M. tricolor* (A. B. R. 83).

M. fimbriata (fringed). *fl.* lilac, fugitive; perianth ¾in. long; standards erect; spathes two- to three-flowered. *l.* three to ten in a basal tuft, linear, rigid, much crisped, obscurely ciliated. *h.* 4in. to 6in. SYN. *Vieusseuxia crispa.*

M. glaucopis (owl-eyed). *fl.*, perianth white, fugitive, 1in. to 1¼in. long, the falls having a bluish-black spot at the base; spathes 2in. to 2½in. long. May. *l.*, produced one solitary, long, single, narrow-linear. Stem 1½ft. to 2ft. long, simple or branched. Cape Colony. SYNS. *Iris pavonia* (B. M. 168), *Vieusseuxia glaucopis* (F. d. S. 423).

M. Huttoni (Hutton's). The species catalogued under this name is *M. spathacea.*

M. longispatha (long-spathed). A synonym of *M. spathacea.*

M. pavonia (peacock-like). *fl.*, perianth bright red, fugitive, 1in. to 1¼in. long, the falls having a bluish-black or greenish-black spot at the base; spathes cylindrical, 2in. long. May. *l.*, produced one solitary, narrow-linear. Stem 1ft. to 2ft. long, simple or branched. Cape Colony. (B. M. 1247.) SYN. *Iris pavonia* (A. B. R. 61).

M. p. lutea (yellow). *fl.* yellow; falls not spotted. SYN. *M. tricuspis lutea* (B. M. 772).

M. p. villosa (villous). *fl.*, falls bright purple, with a bluish-black spot and a hairy claw. 1789. SYN. *Iris villosa* (B. M. 571).

M. Robinsoniana (Robinson's).* *fl.*, perianth pure white, fugacious, 3in. to 4in. across; segments of both rows spreading, the outer ones above 1in. broad, the inner ones narrower; clusters loosely corymbose; spathes 1½in. to 2in. long. June to September. *l.*, radical ones firm, ensiform, 5ft. to 6ft. long. Stem 5ft. to 6ft. long. Australia, 1877. A distinct and handsome species, resembling *Phormium tenax* in habit. The flowers of this plant in its native country are largely employed in wedding bouquets. (B. M. 7212.) SYN. *Iris Robinsoniana* (G. C. 1872, p. 392).

M. Sisyrinchium is identical with *Iris* (*Xiphion*) *Sisyrinchium.*

M. sordescens (dirty). A synonym of *M. tristis.*

M. sulphurea (sulphur-coloured). *fl.* sulphur-yellow, with orange and brown markings, about 1in. in diameter, disposed in a single, terminal cluster. *l.* two, linear, 4in. long. Stem slender, erect. Corm small, globose. 1898. (B. M. 7658.)

M. Tenoreana (Tenore's). A synonym of *Iris* (*Xiphion*) *Sisyrinchium.*

M. tricolor (three-coloured). A synonym of *M. ciliata barbigera.*

M. tricuspis lutea (yellow). A synonym of *M. pavonia lutea.*

M. viscaria bituminosa is the correct name of *M. bituminosa.*

MORGAGNIA. A synonym of **Simethis** (which *see*).

MORINA. To the species described on p. 383, Vol. II., the following should be added:

M. betonicoides (Betony-like). *fl.* sessile; involucre bristly; corolla bright rose-red, crimson at the bases of three or four of the lobes, the limb ¾in. in diameter; spikes sub-capitate, subtended by opposite bract-leaves tinged with red. June. *l.* 4in. to 8in. long, linear-lanceolate, acute, entire, with very long prickles on the margins. Stem erect or sub-erect, 10in. to 18in. high. Sikkim-Himalaya, 1883. Hardy rock plant. (B. M. 6966.)

M. persica (Persian).* *fl.* pink, disposed in elongated spikes; corolla tube 1in. to 1½in. long. July. *l.* 6in. long, 1in. broad, sessile, doubly spiny-toothed, pubescent or glabrous. Stems 3ft. to 4ft. high, pubescent or villous upwards. Western Himalayas, 1740. A very ornamental hardy perennial. SYN. *M. Wallichiana.*

M. Wallichiana (Wallich's). A synonym of *M. persica.*

MORINGA. *M. oleifera* is the correct name of *M. pterygosperma.*

MORISIA (named in honour of G. G. Moris, 1796-1869, Professor of Botany at Turin, and joint author with G. de Notaris of "Flora Capraríæ"). ORD. *Cruciferæ.* A monotypic genus. The species is an interesting alpine perennial, requiring a sandy nook in the rockery. It may be propagated by seeds or by divisions.

M. hypogæa (underground). *fl.* golden-yellow, ¾in. broad, very numerous; petals spathulate; scape decurving after flowering and burying the ripening fruit in the soil. March. *l.* spreading horizontally from the root, 2in. to 3in. long, linear, pinnatisect or pinnatifid. Stems short or wanting. Rocks and sandy shores of Sardinia and Corsica, 1890. (B. M. 7593; G. C. 1890, ii., p. 503; Gn. 1891, 822.)

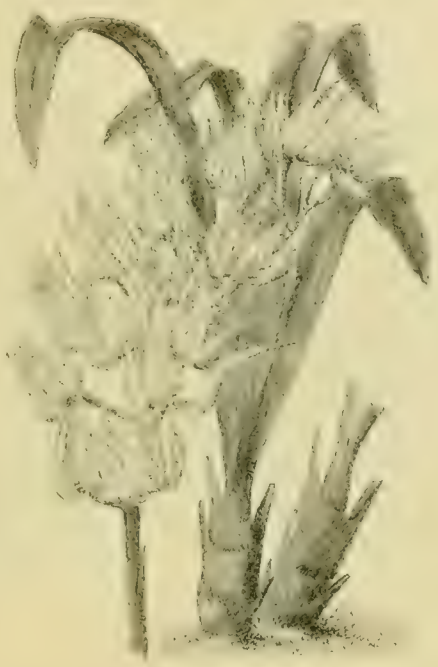


FIG. 574. MORMODES PARDINA.

MORMODES. SYN. *Cyclosia.* To the species, &c., described on pp. 384-5, Vol. II., the following should be added:

M. aromatica (aromatic). *fl.* of a greenish-brownish-purple, with darker spots, having a fragrance like aromatic vinegar; sepals and petals roundish-ovate, acute, secund, concave; lip narrow-cuneate, convex, the middle segment triangular, acuminate, hood-like; raceme short, erect. *l.* smaller than in *M. pardina* (to which this species is related). Mexico, about 1840. (B. R. 1843, t. 56.) The form *oleo-aurantiaca* has orange flowers, dotted and streaked with blackish-purple. 1880.

M. badia (brown). *fl.* about a dozen borne on an erect scape 1ft. long; sepals and petals dull red; lip yellowish-brown. Peru, 1897. Allied to *M. ignea.* There is also a yellow form (*lutea*).

M. Buccinator aurea (golden). *fl.* deep orange-yellow; spike strong, about 6in. long. 1891.

M. B. major (larger). *fl.* ochre, larger than in the type; sepals and petals numerously dotted cinnamon; lip with a few pale markings on the sides. Colombia.

M. calantha (beautiful-flowered). A synonym of *M. Colossus.*

M. citrina (citron-yellow). A synonym of *M. pardina unicolor.*

M. Cogniauxii (Cogniaux's). *fl.* somewhat larger than those of *M. Rolfeana*, which they otherwise closely resemble. 1894.

M. Dayana (Day's). *fl.* as large as those of *M. Wendlandi*; sepals and petals ochre, with red, longitudinal lines inside; lip white, revolute, so that the outsides of both halves touch, triangular, with a short, inflexed apiculus in the middle; column white, small, apiculate; raceme few-flowered. 1885.

M. ignea maculata (spotted). *fl.*, sepals and petals yellowish-brown, regularly spotted with dark purplish-brown; lip red, irregularly spotted with dark brown. Peru, 1893. (L. vi., t. 273.)

M. Lawrenceana (Sir Trevor Lawrence's). *fl.*, sepals and petals dark orange-yellow, striped with dark brown within,

Mormodes—*continued.*

dotted outside, lanceolate; lip yellow, copiously spotted with purplish-brown; column white, spotted with purple; racemes many-flowered. *l.* ovate-lanceolate, acuminate. Pseudo-bulbs pyriform. Colombia, 1891. (L. vi., t. 273.)

M. luxata eburnea (ivory-like).* *fl.* wholly ivory-white. 1886. (I. H. ser. v. 35.) A beautiful variety. SYN. *M. Williamsii.*

M. l. punctata (dotted). *fl.* whitish, the sepals and petals marked with small, reddish spots. 1885.

M. l. purpurata (purple). *fl.* light mauve-purple, with dark purple lines and spots on the sepals and petals; side lobes of the lip much darker than the central part. 1886.

M. macrantha (large-flowered). A synonym of *M. Colossus.*

M. Oberlanderianum (Dr. Oberlander's). *fl.*, sepals and petals light yellow, spotted with rose; lip apricot-coloured, darker below, entire. January. *l.* oblong, cuneate, acuminate, and conspicuously veined. Orocue, 1899. (G. C. xxviii., p. 318.)

M. œnantha (wine-flowered). This species closely resembles *M. Buccinator* in form, but the flowers are of a claret-purple tint. 1893.

M. pardina aurantiaca (golden). A variety having golden-yellow sepals and petals, and a lighter yellow lip. (I. H. xxxix., t. 144.) Fig. 574 represents the handsome type.

M. p. melanops (dark-looking). *fl.* very dark brownish-purple. 1886.

M. platychila (broad-lipped). *fl.* pale buff, upwards of 1in. in expanse; lip marked with many dull purple stripes; racemes compact, erect. 1887. A distinct species.

M. punctata (dotted). *fl.*, sepals and petals yellowish-brown, speckled with dark brown, 1½in. long; lip yellow, with numerous chestnut spots, stalked, the blade triangular; column yellowish-white, with minute light purple spots. Habitat not recorded, 1891.

M. Rolfeana (R. A. Rolfe's).* *fl.* large, handsome, and strongly scented; sepals and petals pale green, with darker green stripes, and tinted with brown; lip brownish-crimson above, greenish-yellow below, striped with green, fleshy; column crimson at back, white in front; raceme lax. Peru, 1894. (B. M. 7438; G. C. 1892, xi., p. 203, f. 30; L. vii., t. 289.)

M. vernixia (varnished). *fl.* blackish-purple; sepals and petals broad, shining; lip having the mid-line a little lighter, with blackish-purple spots; column light mauve-purple, with numerous dark spots. Guiana, 1837. Allied to *M. Buccinator.*

M. Wendlandi (Wendland's). *fl.*, sepals and petals yellowish, lanceolate, with cinnamon lines which are sometimes interrupted; lip yellow, with dark purple-dotted lines, rhomboid-dilated, clawed at base; pedicels brown, much dotted; peduncle more than 1ft. long, racemose. Central America.

M. Williamsii is synonymous with *M. luxata eburnea.*

MORNA. A synonym of **Waitzia** (which *see*), *M. nitida* being identical with *W. aurea.*

MOROCARPUS. A synonym of **Debregeasia** (which *see*).

MORUS. To the species described on p. 385, Vol. II., the following varieties should be added:

M. alba aurea (golden). This variety is distinguished from the type by its yellow leaves and branches. 1896.

M. a. globosa (globular). A form of hemispherical habit. 1896.

M. a. nervosa. A variety with prominent veins to the foliage, and bearing large fruits.

M. a. pendula (pendulous). A graceful form, with long, slender, drooping growths. 1897.

M. a. tatarica (Tatarian). This is the Russian Mulberry, which bears small and poor-flavoured fruits.

M. nigra tomentosa (tomentose). A variety having downy leaves beneath.

MOSS, SPANISH. *See* **Tillandsia usneoides.**

MOSS CAMPION. *See* **Silene acaulis.**

MOSS ROSE. *See* **Rosa centifolia muscosa.**

MOSSY-CUPPED OAK. *See* **Quercus Cerris.**

MOTH MULLEIN. *See* **Verbascum Blattaria.**

MOTH ORCHID. *See* **Phalænopsis.**

MOTHERWORT. *See* **Leonotis.**

MOUFFETTA. A synonym of **Patrinia** (which *see*).

MOUNTAIN DAMSON. *See* **Simarouba amara.**

MOUNTAIN GREEN or MOUNTAIN PRIDE, WEST INDIAN. *See* **Spathelia simplex.**

MOUNTAIN MINT. *See* **Pycnanthemum.**

MOUNTAIN PLUM. *See* **Ximenia americana.**

MOUNTAIN TOBACCO. *See* **Arnica montana.**

MOURNFUL WIDOW. *See* **Scabiosa atro-purpurea.**

MOUSSONIA. Included under **Isoloma** (which *see*).

MOUSTACHE PLANT. *See* **Caryopteris Mastacanthus.**

MOWING. An important operation for keeping lawns, verges, banks, golf-links, and similar places in a neat condition. The introduction of lawn-mowers has made the work easier than was the case when the scythe alone was employed: it is also better done. The majority of lawn-mowers perform their work most expeditiously and best when the grass is dry; but when the scythe is used, the early morning, while the dew is on, is preferable. The grass is then erect, offers the greatest resistance to the scythe, and is thus more easily cut. *See* **Lawn Mowers.**

MUCEDINES. *See* **Mould.**

MUCUNA. *M. sempervirens*, originally introduced in 1816, was reintroduced to Kew from China, in 1890; it is not in general cultivation.

MUDAR-PLANT. *See* **Calotropis gigantea.**

MUDDING. A preparation of clay and water made of a thin consistency, in which the roots of young vegetable plants, small trees, and shrubs were at one time dipped to keep them moist until planted.

MUEHLENBECKIA. *M. depressa* is a misprint in a Continental publication for *M. adpressa.*

M. varians (variable). *fl.* disposed in solitary or twin racemes about 1in. long, simple or bifid at base, at the tips of the stems. *l.* petiolate, ovate, acute, truncate-sub-cordate at base; petioles ¼in. to 1in. long. Stems very slender, twining. Habitat not recorded.

MULE. A cross between two species or genera. *See* **Hybridising.**

MULTI-. In compound Latin words, this prefix denotes "many"; *e.g.*, Multidentate, having many teeth; Multijugate, furnished with many pairs of leaflets.

MUNDI-ROOT. *See* **Chlorocodon.**

MURAL. This term is applied horticulturally to plants that grow and thrive on walls.

MURICE. A native name for the bark of several species of *Byrsophyllum.*

MURRAIN BERRIES. *See* **Tamus communis.**

MURRAYA. **Bergera** (which *see*) is included hereunder by Bentham and Hooker. *M. Kœnigii* is the correct name of *Bergera Kœnigii.*

MUSA. To the species and varieties described on pp. 392-3, Vol. II., the following should be added. *M. textilis* and its variety *amboynensis* are largely grown in the Philippines. They yield the Manila Hemp. A very large trade has also sprung up in Bananas, which are chiefly the products of *M. sapientum* and its varieties, and *M. Cavendishii.* For further information on the genus, the reader is referred to J. G. Baker's "Synopsis of the Genera and Species of *Musa*" ("Journal of Botany," 1893, vii., pp. 189-222), and to the Kew Gardens "Bulletin," Aug., 1894.

M. africana is probably a young form of *M. ventricosa.*

M. aurantiaca (orange).* A very handsome plant, closely allied to *M. sanguinea*, but having bright orange-yellow flowers and bracts. *fr.* green, glabrous. Stem rather short. Assam, 1894.

M. Bakeri (Baker's). *fl.*, males in clusters of nine to twelve; spike short; bracts deep crimson inside, intensely glaucous outside; spike short. *fr.* trigonous when immature, dropping off before ripening. *l.* 7ft. long, 2ft. broad; petioles 2ft. long. Stem 10ft. high, 8in. in diameter. Cochin China, 1898. Allied to *M. sapientum.* (B. M. 7627.)

M. Basjoo (native name).* Japanese Banana. *fl.* in a dense panicle 1ft. to 1½ft. long; calyx whitish, 2in. long; peduncle arched, 1ft. long. *fr.* 3in. long. *l.* oblong, thin, bright green, 6ft. to 9ft. long, 1½ft. to 2ft. broad, deltoid at base; petioles stout, about 1ft. long. Stem cylindrical, 6ft. to 9ft. long. Liu-Kiu Archipelago, Japan, 1890. As hardy as *M. Ensete.* (B. M. 7182.) SYN. *M. japonica* (of gardens).

M. calosperma (beautiful-seeded). *fl.* white, numerous, ¾in. to 1in. long; raceme thyrsoid, pendulous. *fr.* pale yellow, 3in. long, not edible; seeds twenty-four to twenty-eight, black, ¼in. long. *l.* 8ft. to 10ft. long, 2ft. to 3ft. across. *h.* 15ft. to 25ft. New Guinea. It is doubtful if this species is yet in cultivation.

Musa—*continued.*

The seeds are made into necklaces by the natives. (G. C. 1896, ii., p. 467, f. 85.)

M. Carolinæ (Caroline's). A synonym of *M. rosacea.*

M. chinensis (Chinese). A synonym of *M. Cavendishii.*

M. discolor (two-coloured). *fl.* in a drooping panicle as long as the leaves; bracts reddish. *fr.* reddish-violet, very palatable. *l.* narrow-oblong, smaller and firmer than in *M. sapientum*, rounded at base, tinged with violet or red beneath when young; petioles 1ft. or more in length. Stem slender, 6ft. to 10ft. long. New Caledonia; widely cultivated.

M. Fehi (native name, Fei). *fl.* sessile, six to eight in a cluster; panicle long, erect. *fr.* yellow when ripe, 5in. to 6in. long, 1in. thick, many in a bunch, angled, "excellent when cooked." *l.* larger and firmer that in *M. sapientum*; petioles 1ft. to 1½ft. long. Trunk cylindrical, 15ft. to 20ft. long, full of violet juice. Tahiti, 1888. *M. Seemanni* (G. C. 1890, ii., p. 162, f. 28) is probably the same species.

M. Hillii (Hill's). *fl.* white, in a dense, erect panicle; calyx about 1in. long; bracts 3in. to 9in. long; peduncle 3in. thick. *fr.* ovoid, 2in. to 2½in. long, densely crowded, not edible. *l.* oblong, arcuate, 12ft. to 15ft. long, 2ft. broad. Stem cylindrical, very robust, 30ft. high, 1½ft. in diameter. Queensland, 1895. (B. M. 7401.)

M. japonica (Japanese). A garden synonym of *M. Basjoo.*

M. kewensis (Kew). *fl.* in a short, erect, shortly pedunculate spike; bracts crimson, tinged with mauve, 4in. to 6in. long; calyx yellowish, 1½in. long. June; October. *l.* oblong, obtuse, 2½ft. long, 6in. to 10in. broad, paler beneath. Stem 3ft. long. 1895. The first hybrid Musa, the parents being *M. Mannii* and *M. rosacea.*

M. Mannii (Mann's). *fl.* yellow, the females in clusters of three; male bracts pale crimson, crowded, 3in. to 4in. long; peduncle (with spike) erect, 6in. long. March. *fr.* green, small, angular. *l.* few, oblong, spreading, 3ft. long, 7in. broad. Stem slender, cylindrical, 2ft. long, tinged with black. Assam, before 1893. (B. M. 7311.)

M. Martini (Martini's). *fl.* bright rose-red. *l.* oblong, long-petiolate, firm, bright green above, glaucous beneath, with reddish veins. Canary Islands, 1892. This has the habit of *M. sapientum*; it is hardier than *M. Ensete.*

M. ornata (ornate). A synonym of *M. rosacea.*

M. paradisiaca is a form of *M. sapientum.*

M. rubra (red). *fl.*, calyx yellow, 1in. long; bracts bright red, the lower ones 1ft. long; peduncle and panicle erect, the latter at first dense. *fr.* 1½in. to 2in. long, in clusters of three or four. *l.* oblong-lanceolate, 1½ft. to 2ft. long, 6in. to 9in. broad; petioles slender, 1ft. long. Rangoon, 1896. Habit of *M. coccinea.* (B. M. 7451.)

M. sapientum. The following are now classed as varieties of this species: *M. Champa* (of gardens), *M. Dacca*, *M. martabanica*, *M. paradisiaca*, *M. Troglodytarum* (SYN. *M. Uranoscopos*), *M. violacea* (of gardens), and *M. zebrina.*

M. Seemanni (Seemann's). Probably identical with *M. Fehi.*

M. sinensis (Chinese). A synonym of *M. Cavendishii.*

M. speciosa (showy). A synonym of *M. rosacea.*

M. Troglodytarum (Troglodyte). A form of *M. sapientum.*

M. ventricosa (swollen). *fl.* in a dense, drooping, oblong-lanceolate panicle; fertile ones 2in. long; petal entire. *l.* oblanceolate-oblong, acute, 4ft. to 5ft. long, much thicker than in *M. sapientum*, with a pale midrib; petioles very short and stout. Stem much swollen, 4ft. in diameter at base. *h.* 8ft. to 10ft. Angola. (G. C. 1881, i., p. 435.) *M. africana* is probably a young form of this.

M. zebrina is a form of *M. sapientum.*

MUSCARI. To the species and varieties described on pp. 393-4, Vol. II., the following should be added:

M. Aucheri lingulatum (Aucher's, tongue-shaped). A synonym of *M. lingulatum.*

M. azureum (azure-blue). A synonym of *Hyacinthus ciliatus* according to "Index Kewensis," but of *H. azureus* by many bulb specialists.

M. comosum tenuiflorum (slender-flowered). *fl.* of two kinds; lower ones olive-green, pear-shaped, pendulous; upper ones deep violet-blue, nearly cylindrical, on longer stalks. 1889.

M. conicum. Of this well-known species there is a garden variety, HEAVENLY BLUE, which is one of the finest Muscari in cultivation. See Fig. 575.

M. latifolium (broad-leaved). *fl.* blue, ten to twenty in an oblong, rather loose raceme about 2in. long; sterile ones narrow-tubular, sessile; fertile ones obovoid-oblong, urceolate; scape erect, 1ft. or more in height. *l.* solitary, oblong-lanceolate, long-attenuated, flat. Bulb small, ovate. Orient.

M. lingulatum (tongue-shaped). *fl.* blue, ¼in. long; raceme dense, sub-spicate, twenty- to thirty-flowered, nearly 1in. long and ¼in. broad; scape 2½in. to 3in. long, livid-blue upwards.

Muscari—*continued.*

l. two or three, narrow-lingulate, fleshy-herbaceous, glabrous 2½in. to 3in. long. Asia Minor. SYN. *M. Aucheri lingulatum.*

M. luteum is a form of *M. moschatum.*

M. Maweanum (George Maw's). *fl.* bright blue, oblong, slightly constricted at the throat, with white segments; racemes dense, 2in. long, 1in. in diameter. *l.* spreading, linear, 6in. to 8in. long, ¼in. broad, slightly glaucous, deeply channelled down the face. Armenia, 1889.

M. monstrosum (monstrous). A form of *M. comosum.*

M. neglectum carneum (flesh-pink). A variety having pretty pink flowers.

M. suaveolens (sweet-scented). A synonym of *M. moschatum.*

M. tenuiflorum (slender-flowered). A form of *M. comosum.*

M. commutatum and *M. neglectum* are two species closely allied to *M. racemosum*, and *M. atlanticum* to *M. armeniacum.*

FIG. 575. MUSCARI CONICUM HEAVENLY BLUE.

MUSCARIA. Included under **Saxifraga** (which *see*).

MUSK HYACINTH. A common name for *Muscari moschatus.*

MUSLIN MOTH. *See* under **Spilosoma Menthastri.**

MUSSÆNDA. To the species described on p. 401, Vol. II., the following should be added:

M. capsulifera (capsule-bearing). *fl.* white, fragrant, in terminal, corymbose cymes; corolla tube 1in. to 1¼in. long, hairy within, the limb ¾in. broad. April and July. *fr.* a loculicidal capsule. *l.* 1¼in. to 2¼in. long, opposite, oblong-lanceolate or obovate; petioles short. *h.* 1½ft. or more. Socotra, 1887. (B. M. 7671.)

M. erythrophylla (red-bracted). *fl.* three or four, sulphur-yellow, funnel-shaped, born on short pedicels; bracts dazzling scarlet, roundish-ovate, 3½in. long, 3in. broad. *l.* opposite, roundish-ovate, bright green. Congo, 1883. A shrub, wholly covered with silky pubescence.

M. theifera (Tea-bearing). A form of *M. uniflora.*

MUSSINIA. A synonym of **Gazania** (which *see*).

MUSTARD BEETLE. *See* **Phaedon betulæ** (Kunst).

MUTISIA. To the species described on p. 401, Vol. II., the following should be added:

M. breviflora (short-flowered). *fl.-heads* 1in. in diameter; ray florets orange-red, ¾in. long, nearly ¼in. broad, obtuse; disk yellow. *l.* pale green, ovate-oblong, retuse or emarginate, cordate at base, 2¼in. long, 1¼in. broad, the margins armed with somewhat distant, spiny teeth, the midrib produced into a tendril. Chilian Andes, 1885. Greenhouse, scrambling shrub. (R. G. 1163, f. 1.)

M. speciosa is the correct name of *M. arachnoidea.*

M. versicolor (various-coloured). *fl.-heads*, ray florets orange, banded with dark brown, 1¼in. long, ¼in. broad, linear, spreading; disk yellow; involucre cylindrical. *l.* linear-subulate, armed, revolute-margined, rigid, produced in a short,

Mutisia—*continued.*

reddish tendril. Stem terete, striated, flexuous, wingless. Chilian Andes, 1824. Greenhouse. (R. G. 1163, f. 2.)

M. viciæfolia (Vetch-leaved). *fl.-heads* orange, large, radiate; involucre long, cylindrical. *l.* pinnate, ending in a tendril, like those of a Vetch; leaflets numerous, lanceolate, acute, glabrous. Peru, Bolivia, &c., 1837. A handsome, greenhouse or half-hardy climber. (R. H. 1891, p. 223.)

MYCARANTHUS. Included under **Eria** (which *see*).

MYCOLOGY. The botany of Fungi.

MYCONIA. A synonym of **Ramondia** (which *see*).

MYLINUM. A synonym of **Selinum** (which *see*).

MYOPORUM. *Bertolonia* is synonymous with this genus.

MYOPSIS. A synonym of **Heterotoma** (which *see*).

MYOSOTIS. To the species and varieties described on p. 403, Vol. II., the following should be added:

M. alpestris elegantissima (most elegant). A pretty, dwarf, free-flowering variety, having white, rose, and blue flowers. 1883. (R. H. 1882, p. 20.)

M. cæspitosa (tufted). *fl.* having a smaller corolla, with the limb often slightly concave. Otherwise like *M. palustris*, of which it was formerly classed as a variety. Europe (Britain). Perennial.

M. c. Reichsteineri (Reichsteiner's).* A charming variety, forming dense tufts covered with blue blossoms during April and May, and not exceeding 2in. in height. Lake of Geneva, 1839.

M. cintra (banded). A synonym of *M. Welwitschii.*

M. dissitiflora alba (white). *fl.* pure white. 1833.

M. d. Dyeræ (Mrs. Thiselton-Dyer's). *fl.* larger; corolla sky-blue, yellow at the mouth, the limb ½in. in diameter. Plant taller than the type. Switzerland, 1893. (B. M. 7589.)

M. d. grandiflora (large-flowered).* *fl.* double the size of those of the type, and produced in great profusion in February. 1836. Garden variety.

M. d. perfecta (perfect). A very large and finely-formed variety. 1883.

M. lithospermifolia (Lithospermum-leaved). *fl.* very large and numerous. *l.* resembling those of *Lithospermum purpureo-cæruleum.* A form of *M. sylvatica.*

M. Lyalli (Lyall's). *fl.* very shortly pedicellate; corolla ⅛in. to ¼in. long; raceme short, simple or forked. *l.*, radical ones oblong-spathulate or obovate-lanceolate, 1in. to 1½in. long; cauline ones narrow, linear-oblong or oblong-spathulate. Stems several, 2in. to 6in. high. New Zealand. A tufted perennial.

M. oblongata (oblong). A synonym of *M. sylvatica.*

M. Reichsteineri (Reichsteiner's). A form of *M. cæspitosa.*

M. scorpioides (scorpion-like). A synonym of *M. palustris.*

M. semperflorens. This by many is considered but a dwarf form of *M. palustris.*

M. sylvatica elegantissima (very elegant). *fl.* white, blue, or pink. A floriferous, dwarf form. (R. G., t. 1033.)

M. s. grandiflora (large-flowered). A variety having flowers nearly ½in. across. 1835. (R. G. 1835, p. 121.) There are also forms with white, pink, and striped flowers.

M. Traversii (Travers').* *fl.* lemon-yellow, almost sessile; racemes densely hispid, capitate, many-flowered. *l.*, radical ones narrowly linear-spathulate, obtuse, 1in. to 1½in. long, narrowed to short petioles, hispid; cauline ones linear-oblong. *h.* 3in. to 8in. New Zealand, 1894. A pretty perennial, with the habit of *M. alpestris.*

M. Welwitschii (Welwitsch's). *fl.* bright blue, with a yellowish-white eye, disposed in scorpioid cymes. *l.* ovate-lanceolate. *h.* about 4in. Spain, 1890. Annual or biennial, of tufted habit. SYN. *M. cintra* (R. G. 1890, p. 191, f. 47).

Varieties. The garden varieties of the Forget-Me-Nots are numerous. Some of the best are: Bexley Gem, Compacta Aurea, Distinction, Jewel, Little Queen, and Princess Maud. Usually the Forget-Me-Nots are relegated to the beds and borders, but they are equally suited to the rockery and to pot culture.

MYRIACTIS (from *myrios*, a myriad, and *aktin*, a ray; in allusion to the number of ray florets). SYN. *Botryadenia.* ORD. *Compositæ.* A genus embracing about five species of greenhouse or half-hardy annuals, all Asiatic and African, allied to *Brachycome. M. nepalensis* (SYN. *M. Gmelini*) has been introduced, but probably it is no longer in cultivation.

MYRIADENUS. Included under **Zornia** (which *see*).

MYRIALEPIS SCORTECHINI. A Palm bearing this name, native of Malaya, is included in the Kew Collection, but it is not in general cultivation, and very little is known concerning it.

MYRICA. Under this genus the authors of the "Genera Plantarum" include **Comptonia** (which *see*) as *M. asplenifolia. M. rubra* is the correct name of the plant grown in gardens as *M. Nagi.*

MYRIOBLASTUS. A synonym of **Cryptocoryne** (which *see*).

MYRIOCARPA (from *myrios*, myriad, and *karpos*, fruit; alluding to the numerous fruits). ORD. *Urticaceæ.* A genus embracing six species of stove shrubs or small trees, inhabiting tropical America, from Brazil to Mexico. Flowers dicœcious, rarely monœcious, scattered at the sides of the filiform branches of the rachis, the males often sessile and densely clustered, the females looser, sessile or pedicellate, often very numerous; spikes or racemes solitary or somewhat fascicled at the axils or nodes, often branched. Leaves alternate, usually ample, petiolate, toothed, penniveined and about three-nerved. Two species are known in gardens. Where room can be spared, they will make a bold and effective appearance. They thrive in good, well-drained loam, and may be propagated by cuttings of the young wood.

M. longipes colipensis (long-stalked, Colipa). *fl.*, female inflorescence consisting of pendulous, forked spikes, 1½ft. to 2ft. long, densely covered with small, flask-shaped ovaries. *l.* 1¼ft. to 1½ft. long, 11in. broad, elliptic, acute, rounded at base, crenate on the margins, clothed with rigid hairs, adpressedly pubescent beneath; petioles 10in. to 12in. long. Mexico, 1837. A shrub or small tree. SYN. *M. colipensis.*

M. stipitata (stalked). *fl.*, females more or less clustered; males sub-sessile, glomerulate; primary branches of the inflorescence short, the ultimate ones sometimes shorter than the leaves. *l.* ovate- or obovate-elliptic, or rarely elliptic-lanceolate, 4in. to 7in. long, shortly acuminate at apex, rounded or obtuse, very rarely sub-cordate at base, unequally serrate-denticulate or crenulate. Mexico, Venezuela, &c. A shrub or small tree.

MYRIOCEPHALUS STUARTII. The correct name of **Polycalymma Stuartii** (which *see*).

MYRISTICA includes *Virola.*

MYRMECODIA (from *murmex*, *murmekos*, an ant; in allusion to those insects making their habitation in the rhizomes). ORD. *Rubiaceæ.* A genus of about a score species of stove, epiphytal, highly glabrous, "ant-nesting" shrubs, with a smooth or prickly, tuberous rhizome; they extend from Sumatra and Singapore to New Guinea, North Australia, and Solomon's Archipelago. Flowers white, small, sessile, solitary or few; calyx tube ovoid, the limb very short, entire; corolla having a cylindrical or sub-urceolate tube, and a four-lobed limb; stamens four. Leaves stalked, clustered at the tips of the branchlets, opposite, narrowed to rather long petioles, coriaceous; stipules persistent, ample, bifid; branches short, quadrangular, thick and fleshy. Two species are in cultivation in this country. They require great heat, and should be treated like epiphytal Orchids. Seedling plants may be raised from the fruits.

M. Antoinii (Antoine's). *fl.* white, small. January. *l.* elliptic-ovate, 4in. long, bright green. Tuberous base of the stem 20in. in circumference, covered with spines; upper portion 9in. long, 1¼in. in diameter, covered with imbricated, woody shields. Torres Straits, 1893. More curious than beautiful. (B. M. 7517.)

M. Beccarii (Beccari's). *fl.*, corolla tube cylindrical, the lobes ovate, thick, longer than the tube. February. *fr.* cylindric-oblong, rounded at apex, four-stoned. *l.* oblanceolate or oblong-oblanceolate, sub-acute, fleshy Tuber not ribbed, lobed, spinulose; spines short, simple; branches thickened-nodose. Tropical Australia, 1884. (B. M. 6283.)

MYROBALAN-TREE. *See* **Terminalia.**

MYROBALANUS. Included under **Terminalia** (which *see*).

MYROBROMA. A synonym of **Vanilla** (which *see*).

MYROSMA (from *myron*, myrrh, balsam, and *osme*, smell; in allusion to the odour of the plant). SYN. *Maranta* (in part). ORD. *Scitamineæ*. A genus embracing about a dozen species of stove, tuberous-rooted plants, closely allied to *Maranta*; one is found in Madagascar and the rest are tropical American. Flowers in axillary or terminal, complanate, unilateral spikes; bracts distichous, imbricated, secund; sepals three, free, equalling or rather shorter than the corolla, which has a short tube and a spreading limb; lip broad. Leaves mostly radical. Stems short, erect. For culture of the species introduced, *see* **Maranta**.

M. Lubbersii. The correct name of *Stromanthe Lubbersiana*.

M. madagascariense (Madagascar). *fl.* greenish-white, in dense, unilateral spikes, consisting of two close rows; peduncles 3in. to 4in. long, dichotomously forked. *l.* distichous, half-a-dozen to a stem, oblong-lanceolate, 1ft. to 1¼ft. long; petioles 1¼ft. to 1½ft. long. Madagascar, before 1872. SYN. *Phrynium unilaterale* (Ref. B., t. 312).

M. nanum (dwarf). *fl.* white, small, disposed in dense spikes. *l.* very hairy, variegated down the midrib with a longitudinal yellowish band. Brazil (?), 1894. A dwarf species.

M. cannæfolium (SYN. *Calathea Myrosma*, of Lindley) has also been introduced.

MYRSINE. Including *Heberdenia*. Bentham and Hooker include **Suttonia** (which *see*) hereunder. *M. Heberdenia* (SYNS. *Ardisia excelsa*, *Heberdenia excelsa*) has been introduced, but is not in general cultivation.

M. Urvillei (Urville's). The correct name of *Suttonia australis*.

MYRSTIPHYLLUM. A synonym of **Psychotria** (which *see*).

MYRTUS. Several species formerly included hereunder are now referred to **Eugenia.** The following changes of nomenclature are based on the "Index Kewensis."

M. Cheken. The correct name is *Eugenia Chequen*.

M. fragrans. The correct name is *Eugenia fragrans*.

M. Luma (of Molina). The correct name is *Eugenia apiculata*.

M. orbiculata is synonymous with *Eugenia cotinifolia*.

M. Pimenta (Pimenta). A synonym of *Pimenta officinalis*.

M. tomentosa is synonymous with *Rhodomyrtus tomentosus*.

MYSTACIDIUM (from *mustax*, *mustakos*, a moustache, and *eidos*, resemblance; in allusion to the pointed prolongation of the lip). SYN. *Aëranthus* (of Reichenbach, jun.). ORD. *Orchideæ*. A genus comprising about a score species of stove, epiphytal, not pseudo-bulbous Orchids, natives of tropical and South Africa. Flowers usually small, racemose; sepals and petals nearly equal, free, spreading; lip affixed to the base of the column, produced in a long, slender spur, the lateral lobes sometimes ovate, erect, sometimes nearly obsolete, the middle one erect or spreading, often ovate, undivided; pollen masses two; racemes axillary, often short. Leaves distichous, usually few, coriaceous, spreading. Stems leafy, rigid. Only two species are at all well-known in gardens. They thrive either on blocks or in baskets, in a cool house, and will succeed under conditions similar to those which suit *Angræcum falcatum*.

M. Curnowianum (Curnow's). *fl.* yellowish-white; sepals and petals ligulate, acute; lip cuneate-obovate, retuse, with a median apiculus; spur filiform, five times as long as the lip. *l.* ligulate, emarginate, fleshy, dark, dull green, rather rough. Madagascar, 1883. SYN. *Aëranthus Curnowianus*.

M. filicorne (thread-horned). *fl.* white, 1in. in diameter, numerous; sepals, petals, and lip lanceolate, acute; spur slender, 2in. long or more. *l.* narrow-oblong, 2in. to 5in. long, about ¼in. broad, obtusely two-lobed at apex. Natal, 1887. A pretty, free-flowering, Angræcum-like Orchid, of tufted habit. (G. C. ser. iii., vol. ii., p. 135.)

M. dolabriforme, a species of botanical interest, is in the Kew Collection. *M. Hariotianum* has also been introduced, but is of no horticultural value.

MYTILASPIS POMORUM. Another name for the Oyster-shell Bark Louse, or **Apple Mussel Scale** (which *see*).

MYTILASPIS VITIS. *See* **Vine Scale Insects.**

MYZUS PERSICÆ. *See* **Peach—Insect Pests.**

MYZUS RIBIS (CURRANT APHIS). *See* **Aphides.**

NÆGELIA. The Hybrid Nægelias now in commerce, with their richly-coloured, velvet-like foliage and bright-coloured, bell-shaped flowers, are far and away superior to the old kinds. Some of the best will be found enumerated below. A succession of these decorative plants may be had by planting in April, May, and June.

ABOMEY, tube rose; limb white, spotted with rose; leaves brown, prettily variegated. ACHIMENOIDES, tube yellowish-rose outside, yellow dotted rose within; lobes light rose. AMABILIS, pure white, with blotched lip; a beautiful hybrid. BRIOCHE, yellowish, pink-spotted; tube rose. COLOMBINE, lemon-yellow. HYACINTHINA, white or pink; floriferous. LEICHTLINI, yellow, suffused with rose at top. MASSENET, carmine and chrome-yellow. PRINCE DE BULGARIE, tube orange; limb and inside of throat deep yellow, rose-spotted. SAPPHO, white, tinged rose, with canary-yellow throat. SIRIUS, tube carmine-red, yellow outside; limb yellow, spotted with rose.

NÆNIA TYPICA. *See* **Vine Moths.**

NAGEIA. Included under **Podocarpus** (which *see*).

NAGELIA. Included under **Cotoneaster** (which *see*).

NAIL-GALLS. *See* **Tilia—Insects.**

NAILWORT. *See* **Paronychia.**

NAPÆA DIOICA. The correct name of **Sida Napæa** (which *see*).

NAPOLEONA. Four species are now referred to this genus. To those described on p. 409, Vol. II., the following should be added:

N. imperialis cuspidata (cuspidate). This differs from the better-known, typical *N. imperialis* in its larger flowers, which are cream-coloured with a crimson centre, regularly five-angled, with straight sides (not five-lobed as in *N. imperialis*); the leaves are much larger, being 8in. to 10in. long and 4in. to 5in. broad. 1896. (G. C. 1886, xxv., p. 657, f. 147 B, under name of *N. cuspidata*.)

N. Miersii (Miers'). *fl.*, corolla yellowish outside, pink on the ribs, orbicular, about forty-toothed and ribbed; within three-coloured, the outer zone yellowish, the next pink, and the innermost white; corona white, circled with pink at base. October. *l.* ovate-oblong, obtuse, cuspidate, rounded or cuneate at base. Western tropical Africa, 1886. (B. M. 7199.) SYN. *N. Whitfieldii*.

N. Whitfieldii (Whitfield's). A synonym of *N. Miersii*.

NAPOLEON'S WEEPING WILLOW. *See* **Salix babylonica Napoleona.**

NARCISSUS. Including also *Philogyne*, *Queltia*, *Schizanthes*, and *Tros*. Despite the fact that these bulbs are amongst the easiest to cultivate, yet the failures recorded are very numerous, more especially with amateurs. One of the chief causes is late planting, irrespective of variety. There are some varieties which may be planted in November, or even later, without any appreciable falling off in quantity or quality of blossom being noticeable; while there are others—the *Poeticus* section, for instance—that can hardly be planted or replanted too early. In fact, the best results with these are obtainable when the bulbs are inserted by the end of July. To those unacquainted with the root-action of the different varieties, this may appear unduly early, and calculated to interfere with the ordinary summer routine work, as well as with the border occupants; but it is an important factor in the successful growth of the bulbs. The majority of Bed and Border Narcissi are, however, better planted during August and early September at the latest, and only on an emergency should the work be deferred later.

Again, the depth at which Narcissi should be planted may not seem an important detail, yet it is one, and it is, moreover, not as often considered as it should be. The actual depth will vary with the size of the bulb; but a very good rule-of-thumb calculation is that suggested by Mr. William Barr—namely, that all Narcissi bulbs should be covered with soil once-and-a-half their own depth, measuring from the collar of the neck to the actual base. On no account should the bulbs come in contact with crude manure, or they will assuredly be injured. Where manure is rendered necessary by the poorness of the soil at the time of planting, it should be well rotted, and placed at such a depth that the roots of the bulbs do not run into it. Many cultivators prefer, however, to utilise portions of the garden for Narcissi culture which have been enriched for a previous crop. This is very desirable in sandy soils. Cultivators should also take care that the bulbs rest upon

Narcissus—*continued.*

the soil, and are not "hung up." The actual disposition of the bulbs will vary with the taste of the individual; but as a rule, good-sized, irregular groups of one variety give the best effect in beds and herbaceous borders. Formality should be studiously avoided. Many who grow simply for cutting, dig a narrow trench and plant the bulbs in that; while others prefer lines.

Plenty of water is essential in the growing season, and the flowers are always more beautiful in a moist season than in a dry one; while there are fewer complaints as to "blindness" through the bulbs receiving a check comparatively early in their growth. An imperfectly understood detail in connection with Border and Bed Narcissi is "lifting." Many cultivators lift their bulbs each year, and usually before the foliage has matured. This is a fatal error. As a rule, and providing the soil be suitable—say a nice moist loam—the bulbs do not need annual lifting. Many varieties may be left for years, indeed until the soil shows signs of exhaustion and the bulbs of deterioration. Then the whole batch should be lifted, and if the entire stock could be transferred to a different part of the country it would most materially benefit it. It is surprising what a change of quarters will do, and the recuperative power that it possesses. Bulb-growers are aware of this, and periodically change the Narcissi stock when they have trial grounds situate in two widely different parts of the country.

Lifting must always be done with care, and the best time for the operation is when the foliage has assumed the yellow stage preparatory to decay. Where only just a change of quarters is called for, as in the average garden, the bulbs, after the process of lifting, should be carefully dried in a cool, airy shed. As soon as properly dry, any offsets large enough may be separated from the parent plants either by pulling them apart or by cutting. Then, again, there are some varieties which are best naturalised—in fact, they refuse to grow as border plants. These should be planted as freely as possible in the grass. Take the English Lent Lily; this is never so happy as when in the meadow-land; or again, the beautiful Pallidus Præcox, Scoticus, Spurius, and many others. Once a stock of these is planted in the grass, they will increase by means of seed in the course of a few years. This is a

FIG. 576. NARCISSUS LEEDSII NATURALISED.

beautiful form of gardening. Fig. 576 represents some Leedsii Narcissi naturalised at Kew Gardens. When planting bulbs in meadow-land they may be dibbled in with a crow-bar, or similar tool, but in lawns the grass had better be taken up for the purpose, and the soil underneath arranged for their reception.

For general planting some of the best varieties are to be found in Golden Spur, P. R. Barr, Barrii Conspicuus,

Narcissus—*continued.*

Maximus, Baroness Heath, Sir Watkin, Empress, Grandis, Horsfieldii, "Eggs and Bacon," Gwyther (Fig. 577), W. P. Milner, Henry Irving, King of the Netherlands, and Johnstoni Queen of Spain. Any or all of these

FIG. 577. NARCISSUS GWYTHER.

varieties make ideal pot plants. Those who wish to naturalise the bulbs will find Golden Mary, Duchess of Brabant, Obvallaris, Rugulosus, Princeps, Ornatus, and Thomas Moore, besides the varieties referred to above, give satisfactory results. There is in addition a most distinct and beautiful subject adapted either for pots or for growing in ornamental bowls. We refer to the Chinese Sacred Lily, Water Fairy Flower, Joss Flower, Flower of the Gods, or Good Luck Lily. This is a variety of Polyanthus Narcissus. Without any soil or without any more accommodation than an ordinary sunny living-room window affords during the day, this flower may be enjoyed in winter. At night the bowls should be taken from the window and stood where they are less likely to be affected by frost. Many Daffodils may also be grown in bowls in a similar manner.

Besides the larger varieties of Narcissi employed for pot culture, there are a number of miniature species and varieties which must not be overlooked for pot work. These are, in addition to those mentioned in Vol. II., *N. minimus*, *N. juncifolius*, *N. minor*, *N. nanus*, *N. Bulbocodium monophyllus*, and *N. cyclamineus*. There are also a host of small-flowering kinds too fragile to be risked in the mixed border, but whose beauty ought not to be lost. For these a place on the rockery should be assigned, and providing a suitable carpet-plant is provided, they will push up their flowers before winter's icy grip has released its hold. They should not be disturbed so long as they are doing well. In low-lying pockets in the rock garden might be tried *N. Bulbocodium* and its varieties, except *monophyllus* (Hoop Petticoat), as well as *N. cyclamineus*, all of which are moisture-lovers; while in other pockets might be inserted *N. nanus*, *N. minimus*, *N. lobularis*, *N. triandrus albus*, and *N. juncifolius*. All will not flourish, though sufficient will to justify the experiment. Many advocate the planting of *N. Bulbocodium monophyllus*, but this, though undoubtedly dainty, is not often a success, even where the best of conditions—a warm, sheltered position, and a rich, light soil—are forthcoming. To appreciate this pretty species at its true worth, it must be grown in a pot and kept in a cool frame or greenhouse, when, if well watered, the exquisite flowers will be produced in

Narcissus—*continued.*

January and February. A dozen bulbs may be accommodated in a 5in. pot.

PESTS. It may be urged in respect of Narcissi that they are remarkably free from pests, either animal or vegetable. Mice, rats, and rabbits are sometimes troublesome, and these must be trapped. Occasionally, too, the Lily Fungus attacks the bulbs, causing them to present a scabby appearance, and later affecting the foliage. As a preventive measure, Veltha has been found of use. Of insect pests, the **Narcissus Fly** (which *see*) is the worst; but sometimes the larvæ of *Bibio Marci* (**St. Mark's Fly**) (which *see*) attack bulbs of Daffodils and other Narcissi. Then the very common Bulb-Mite (*Rhizolglyphus echinopus*) works considerable mischief to the fleshy roots. This is a minute pest, and should be treated as advised under **Eucharis.** It is found upon most bulbous subjects.

To the species and varieties described on pp. 411-20, Vol II., the following should be added:

N. Bernardi (Bernard's). This has an orange- or lemon-yellow and more plicate corona half as long as the spreading, white segments; otherwise it does not differ from *N. Macleaii* (of which Baker classes it as a form). South of France.

N. Bulbocodio-Pseudo-Narcissus (hybrid). *fl.* milky-white, horizontal, 1½in. long; tube narrowly funnel-shaped, tinged with green, ⅝in. long; segments linear, ascending, rather shorter than the corona, which is ⅝in. long, faintly crenulate at the throat; peduncle slender, terete, one-flowered. *l.* linear, slightly glaucescent, channelled down the face, ⅛in. broad. Portugal, 1887. An interesting natural hybrid between the species indicated in the name. (G. C. 1887, i., f. 78.)

N. calathinus is a sub-species of *N. triandrus.*

N. cyclamineus (Cyclamen-like). A form of *N. Pseudo-Narcissus.*

N. elegans (elegant). The correct name of *N. serotinus elegans.*

N. Johnstoni (Johnston's). A variety of *N. Pseudo-Narcissus.*

N. Jonquilla Burbidgei (Burbidge's). A variety having the corona cut into six segments nearly to the base. Native country unknown, 1885.

N. juncifolio-muticus (hybrid). *fl.* three, on a slender, terete peduncle, the two upper ones ascending, the lower one horizontal; perianth tube greenish-yellow, ⅜in. long, the expanded limb bright lemon-yellow, horizontal, 1½in. in diameter, the segments ovate-oblong, much imbricated; corona orange-yellow, obconical, ⅛in. long. Latter end of April. *l.* narrow-linear, channelled. Pyrenees, 1886. An interesting natural hybrid between *N. juncifolius* and *N. Pseudo-Narcissus muticus.* (G. C. 1889, vi., p. 161, f. 22.)

N. major (larger). A variety of *N. Pseudo-Narcissus.*

N. minor (smaller). A variety of *N. Pseudo-Narcissus.*

N. moschatus (musky). A variety of *N. Pseudo-Narcissus.*

N. muticus (curtailed). A form of *N. Pseudo-Narcissus.*

N. poeticus bifiorus plenus (two-flowered, double). *fl.* double, two on each scape. 1835. A fine variety. (R. G. 1193.)

N. Pseudo-Narcissus cyclamineus (Cyclamen-like). *fl.*, perianth lemon-yellow, the tube very short, the segments nearly 1in. long, strongly reflexed from the base; corona as long as, or longer than, the segments, rather deeper in colour, the edge crenate; scape sub-terete, 6in. to 12in. long. Spring. *l.* two or three, linear, sub-erect, deeply channelled. Bulb ½in. in diameter. Portugal. (B. M. 6950.)

N. P.-N. Johnstoni (Johnston's). *fl.* pale sulphur, remarkable for the long and rather slender corona tube, which is about ¾in. long, and less spreading at the mouth than in the common Daffodil. Portugal, 1887.

N. P.-N. muticus (curtailed). *fl.* 1in. to 1½in. long; tube obconical, ½in. long and broad; segments sulphur-yellow, 1in. to 1½in. long; corona deep lemon-yellow, as long as the segments, ⅜in. in diameter at the very truncate throat. Pyrenees. (F. M., t. 224, under name of *N. muticus.*)

N. Sabinii (Sabine's). *fl.* solitary, drooping; perianth tube green, cylindrical, somewhat funnel-shaped; segments whitish, shining, broad, imbricated, ovate; corona yellow, plaited, ⅜in. long, erose; scape ancipitous, channelled. Spring. *l.* pale green, broad, few. This form, which is closely allied to *N. Macleaii*, has been re-introduced by Mr. Barr. (B. R. 762.)

N. scaberulus (slightly scabrous). *fl.*, perianth yellow, ½in. to ⅝in. across, stalked, bent; tube greenish, ½in. to ⅝in. long; segments ovate, imbricated, the three inner ones broadest, apiculate, slightly fringed at tips, spreading, ultimately slightly reflexed; corona about ½in. across, cup-shaped, more or less crenate; scape 2½in. to 4in. long, one- or two-flowered. March and April. *l.* two, linear, more or less prostrate, longer than the scape, slightly furrowed above, two-angled beneath. Bulb small. Oliviera do Conde, Portugal.

N. serotinus elegans is now classed as a species.

Narcissus—*continued.*

N. syriacus (Syrian). A synonym of *N. Tazetta.*

N. Tazetta intermedius is now accorded specific rank.

Garden Varieties. A few of the more recent and desirable varieties in the various sections are here briefly noticed:

Types of Garden Narcissi.

N. Backhousei (Backhouse's). *fl.* solitary, horizontal; tube obconical, about ½in. long and broad; segments sulphur-yellow, spreading horizontally, oblong, imbricated, 1in. to 1½in. long; corona lemon-yellow, a little shorter than the segments, with a deeply-lobed, plicate, erect throat. An intermediate form between *N. Pseudo-Narcissus* and *N. incomparabilis*, the former of which it resembles in stature and leaves.

N. Barrii (Barr's). *fl.* horizontal or ascending; perianth tube greenish, sub-cylindrical, 1in. long; segments pale sulphur-yellow, oblong, spreading horizontally, slightly imbricated when fully expanded, 1½in. long, ¾in. broad at the middle; corona lemon-yellow below, orange-yellow at the throat, obconical, ½in. long, ⅝in. broad at the throat, crenulate, strongly plicate in the upper half; stamens all six opposite the base of the corona; style just overtopping the anthers; ovary oblong-triangular, ⅛in. long; peduncle ancipitous, one-flowered, about 1ft. long; pedicel and spathe as in *N. incomparabilis.* *l.* linear, twisted, glaucous, above 1ft. long, ½in. broad. No doubt a hybrid between *N. incomparabilis* and *N. poeticus*, the former predominant.

N. Burbidgei (Burbidge's). *fl.* horizontal or ascending; perianth tube green, cylindrical, 1in. long; segments pure white, spreading horizontally, not imbricated, oblanceolate-oblong, cuspidate, 1½in. long, ½in. broad; corona obconical, ½in. long, ½in. broad at the throat, very plicate, crenulate, the base yellow, the edge bright red; anthers and stigma placed in the corona; ovary oblong-triangular, ⅛in. long; peduncle one-flowered, ancipitous, 1ft. long; pedicel and spathe as in *N. poeticus.* *l.* linear, glaucous, twisted, above 1ft. long, ½in. to ¾in. broad. No doubt a hybrid between *N. poeticus* and *N. incomparabilis*, the former element strongly predominating.

N. Humei (Hume's). *fl.* solitary, cernuous; tube obconical, ½in. long, ½in. broad; segments sulphur-yellow, oblong, loosely ascending, 1½in. long, ½in. broad; corona lemon-yellow, 1in. long, 1in. broad at the erect throat, which is minutely crenulate. *l.* ½in. broad. A hybrid, no doubt between *N. poculiformis* and *N. Pseudo-Narcissus.*

N. Leedsii (Leeds'). *fl.* about horizontal; perianth tube greenish, cylindrical, ¾in. long; segments milk-white, spreading, oblanceolate-oblong, cuspidate, 1in. to 1½in. long, ½in. to ¾in. broad at the middle, not imbricated; corona pale sulphur-yellow, ½in. long, ½in. in diameter at the throat, plicate in the upper half, crenulate at the erect margin; anthers all six placed opposite the base of the corona; style overtopping the anthers; ovary oblong-triangular, ⅛in. to ¼in. long; peduncle one-flowered, ancipitous, a little longer than the leaves; pedicel 1in. long; spathe one-valved, membranous, clasping the pedicel and ovary. *l.* linear, twisted, glaucous, 1ft. long, ½in. broad. Probably a hybrid between *N. poculiformis* and and some form of *N. incomparabilis.*

N. Macleaii. This species is described in Vol. II.

FIG. 573. NARCISSUS GLORY OF LEIDEN.

Narcissus—*continued.*

Group I. Magnicoronati (*Ajax, or Pseudo-Narcissus*).

TRUMPET DAFFODILS—SELF-YELLOW.

Alvarez. This is an Emperor in miniature. Free.

Ard Righ. Perianth full yellow; trumpet deep yellow. Early.

Big Ben. Flowers 5in. across. Perianth primrose; trumpet yellow. A very large and a very expensive variety.

Captain Nelson. Flower a soft yellow. Dwarf.

Glory of Leiden. Flower large and handsome, with perianth and trumpet of a uniform colour. A fine variety. See Fig. 578.

Golden Spur. Flower deep yellow, with large lobed trumpet. Excellent for pot culture and for forcing.

Harbinger. Perianth sulphur; trumpet yellow. Early.

Johnstoni Queen of Spain. Flowers soft yellow, with reflexed perianth and straight trumpet. Suitable for naturalising.

Lady Helen Vincent. Flower a soft clear yellow, with large trumpet.

Monarch. Perianth and trumpet rich yellow. Of good form and substance, but most expensive.

P. R. Barr. Perianth primrose; trumpet rich yellow. Of good form and sturdy.

TRUMPET DAFFODILS—TWO-COLOURED.

J. B. M. Camm. Perianth white; trumpet chrome-yellow. A beautiful variety.

Mrs. Morland Crosfield. Perianth pure white; trumpet clear yellow. A showy variety.

Victoria. Perianth creamy-white; trumpet rich yellow, elegantly frilled. The best variety for pot work.

Weardale Perfection. Perianth white, large; trumpet pale primrose. One of the finest of all Daffodils, but out of the range of all except the rich.

TRUMPET DAFFODILS—WHITE AND SULPHUR.

Apricot. Perianth white; trumpet soft primrose at first, shading off to apricot. Violet-scented.

FIG. 579. NARCISSUS MADAME DE GRAAF.

Madame de Graaf. Perianth pure white; trumpet pale primrose, passing to white Free. See Fig. 579.

Snowflake. Perianth white; trumpet apricot, but becoming pure white. Strong grower.

Group II. Mediocoronati.

INCOMPARABILIS (CHALICE-CUPPED DAFFODILS).

Crown, or Cup, as a rule half as long as the Perianth Segments.

Commander. Perianth pale sulphur; cup yellow, stained orange-red. Bold grower.

Narcissus—*continued.*

Mabel Cowan. Perianth white; cup margined with orange-scarlet.

Stella Superba. Perianth clear white, spreading; cup yellow, very showy. Excellent variety for cutting.

BARRII (STAR NARCISSI, WITH SHORTENED CHALICE CUP).

Perianth Segments twice (or more) the length of the expanded Cup, or Crown.

Cecily Hill. Perianth soft primrose, with yellow base; cup yellow, flushed orange-red, and edged cinnabar-red. Late-flowering variety.

Dorothy E. Wemyss. Perianth white, large; cup canary-yellow, edged orange-scarlet.

Mrs. C. Bowly. Perianth pure white; cup orange-red. A striking flower.

LEEDSII (EUCHARIS-FLOWERED WHITE DAFFODILS).

Resembling in form the Incomparabilis and Barrii Sections, but differing in colour of Cup, which is pure white or pale yellow passing to white.

Maggie May (SYN. **Edmond's White**). Perianth white, spreading; cup citron-yellow, elegantly frilled. The best in the section.

Una. Perianth creamy-white; cup bright citron-yellow, tinged apricot. Violet-scented.

BACKHOUSEI (DAFFODILS WITH TRUMPET-SHAPED CROWNS).

Border Maid. Perianth pure white; trumpet clear yellow.

TRIDYMUS (TRIPLE-CROWN DAFFODILS).

Cloth of Gold. Perianth rich yellow; cup deep gold. Sweetly scented and free.

St. Patrick. Perianth soft yellow; cup rich yellow. A robust grower.

Group III. Parvicoronati.

BURBIDGEI (HYBRID POET'S DAFFODILS OR STAR NARCISSI).

Sequin. Perianth snowy-white; cup golden-yellow, broad, and flattened against the perianth. Very distinct.

POETICUS (PURPLE-RINGED POET'S DAFFODILS).

Cassandra. Perianth clear white, wide-spreading; cup edged with dark red. A vigorous grower.

NARCISSUS FLY (*Merodon equestris*). When dealing with this Fly in the Dictionary proper it was remarked that, owing to its comparative scarcity in England, there was but little need for more than a passing notice. In the lapse of time, however, circumstances have arisen which call for a modification of the

FIG. 580. NARCISSUS FLY—PERFECT INSECT, LARVA, AND PUPA.

statement. The Narcissus Fly has now appeared in this country in sufficient numbers to be constituted a pest. Cornwall has been the chief centre of its ravages, as there large acreages of Narcissi are under cultivation. In some districts, notably around Penrhyn, the Fly has proved extremely troublesome, and thousands of bulbs have been sacrificed.

At planting time very great care should be exercised, and any decaying or soft-necked bulbs should at least be viewed with suspicion, cut open, and any maggots found removed. To plant such bulbs with the maggots enclosed is to increase the trouble. One bulb one maggot is the usual order of things, but sometimes two of the grubs are snugly ensconced within a single bulb.

Those bulbs which are known to be of Continental origin will need to be very carefully gone over, as the Narcissus Fly is a common insect in many parts. Despite all reasonable precautions, many of the infested bulbs will necessarily be planted. The grower, therefore, should watch the plants in spring, and at once uproot any suspects. Later, too, at the time for the Flies to be on the wing (May), the plants should again be watched, and

Narcissus Fly—*continued.*

if the insects, which are bee-like and conspicuous, are observed hovering over the Narcissi, the bulbs should be lifted as early as possible after maturing, and any doubtful ones destroyed. The soil should then be treated with gas-lime to destroy the insects pupating in the soil.

FIG. 581. NARCISSUS BULB AFFECTED BY MERODON EQUESTRIS.

Figs. 580 and 581 show respectively the various stages of the Narcissus Fly, and also a badly-affected bulb after the Fly has been removed.

NARDOSTACHYS. This genus is now regarded as monotypic, *N. grandiflora* being identical with *N. Jatamansi*.

NARTHEX. *N. Asafœtida* is synonymous with **Ferula Narthex** (which *see*), and *N. Pollaki* is identical with **Dorema Ammoniacum**.

NATAL LABURNUM. *See* **Calpurnia lasiogyne**.

NATURALISED. A term applied to an exotic plant that has become established and reproduces itself spontaneously. A still commoner acceptation is in allusion to a delightful form of gardening for whose introduction we are largely indebted to Mr. W. Robinson—namely, of planting bulbous and other subjects amidst their natural surroundings: for example, the cultivation of the Common Daffodil and the Snakesheads in meadowland; and of other species in woodlands, wild gardens, &c.

NATURAL ORDER. A family; a group of one or more genera, forming a division of a class.

NATURAL SYSTEM. Jussieu's system of botanical classification by which plants are arranged according to their natural affinities.

NAUCHEA. A synonym of **Clitoria** (which *see*).

NAUCLEA. *N. Gambier* and *N. sessilifructus* are synonyms of two species of **Uncaria** (which *see*).

NAVARRETIA, or **NAVARRETTIA.** Included under **Gilia** (which *see*).

NAVET, or **NAVEW.** Another name for **Rape** (which *see*).

NECK. This term is also applied to the upper end of the sheathing petiole in Grasses; to the throat of a gamopetalous corolla; and to the thin end of a Pear.

NECKLACE POPLAR. *See* **Populus monilifera**.

NECTARINE. To the varieties described in Vol. II., the following should be added:

Advance. Flowers large. Fruit large, green, and mottled with red on the sunny side; flesh greenish-yellow, melting, juicy, and of fine flavour. Leaves glandless. A free-bearing, early, hardy, and vigorous variety.

Darwin. Flowers large. Fruit large, orange, deeply flushed with red on the exposed side; flesh light yellow, melting and rich, ripening in the middle of August. Glands kidney-shaped.

Dryden. Flowers small. Fruit large, nearly covered with a deep dark red colour; flesh white, very juicy, and of exquisite flavour, ripening outside end of August or early in September. Glands kidney-shaped. A vigorous grower, and one of the best and most prolific varieties.

Early Rivers. Flowers large. Fruit medium to large, greenish in the shade, bright red on the sunny side; flesh whitish, very juicy and of excellent flavour; most valuable for early forcing. Glands kidney-shaped. Ripening outside in the middle of July, and a vigorous grower and free bearer. A splendid variety.

Milton. Flowers large. Fruit large, yellow, dark red on the sunny side; flesh white, rich, very juicy, and of exquisite flavour, ripening middle of September. Glands round. Tree very vigorous and prolific.

Murrey. Flowers small. Fruit medium, roundish, ovate, nearly covered with dark red; flesh whitish, very melting and delicious, ripening early in August. A fine, hardy variety and an abundant bearer.

Pineapple. Flowers large. Fruit large, deep orange, red on the sunny side; flesh yellow, melting, juicy, and of fine flavour, ripening end of August. Glands round. Hardy and a great bearer. An improved and later form of **Pitmaston Orange.**

Precoce de Croncels. Flowers large. Fruit medium to large, light yellow, flushed with scarlet on the sunny side; flesh whitish, melting, very juicy, and of delicious flavour. A variety of French origin, sent out by Messrs. J. Veitch and Sons, Chelsea. It is one of the earliest, and excellent for forcing or outside culture, as the tree is hardy, a vigorous grower, and an abundant bearer.

Rivers's White, described in Vol. II., is a poor bearer.

Stanwick Elruge. Flowers small. Fruit medium, light green, deep dark red on the sunny side; flesh whitish, melting, juicy, and very rich, ripening middle of August. Glands kidney-shaped. A very fine variety, especially under glass.

PESTS. The Nectarine is sometimes attacked by the Shot-Hole Fungus—**Cercospora** (which *see* for remedies).

NECTRIA DITISSIMA. *See* **Canker**.

NEGRETIA. A synonym of **Mucuna** (which *see*).

NEGRO'S HEAD. *See* **Phytelephas macrocarpa**.

NEGUNDIUM AMERICANUM. A synonym of **Acer Negundo** (which *see*).

NEGUNDO. This genus is now included under **Acer** (which *see*). To the species and varieties described on p. 430, Vol. II., the following should be added:

N. californicum (Californian).* *fr.* oblong, pubescent. *l.*, leaflets three, incised-toothed, pubescent or hairy, especially below and on the petioles. Higher California. A very vigorous tree, with beautiful foliage.

NEILLIA. SYN. *Adenilema*. Including *Physocarpa*. To the species described on p. 431, Vol. II., the following should be added:

N. opulifolia foliis aureo-marginatis (gold-margined-leaved). *l.* irregularly lobed, variegated with yellow. 1890. (R. G. 1890, p. 9, f. 2-3, as *Spiræa* var.)

N. Torreyi (Torrey's). This is similar to *N. opulifolia*, but is more compact in habit and only 2ft. to 3ft. in height. Rocky Mountains, 1889. (G. & F. 1889, p. 4, f. 84.)

NELITRIS. According to the compilers of the "Index Kewensis," *Decaspermum* is the correct name of this genus.

NELUMBIUM. Sacred Lotus is another popular name for the species of this genus, which number only two, although specific names have been given to several varieties of *N. speciosum*, the only distinction being in the colours of their flowers, which range from white to deep rosy-pink and in some cases are semi-double.

NEMASTYLIS. Seventeen species of this genus are described by J. G. Baker. Flowers usually blue; filaments free or united; style-branches cleft to the base into subulate forks.

NEMATANTHUS. *N. chloronema* is now considered to be merely a form of *N. longipes.*

NEMATANTHUS (of Nees). A synonym of **Willdenowia** (which *see*).

NEMATOID. Thread-like.

NEMATOSTYLIS. *See* **Nemastylis.**

NEMATUS CONSOBRINUS AND N. RIBESII. *See* **Gooseberry and Currant Sawflies.**

NEMEOPHILA PLANTAGINIS. *See* **Tiger Moths.**

NEMESIA. To the species described on p. 433, Vol. II., the following should be added. *N. strumosa* and *N. versicolor compacta* are both half-hardy annuals. The former is much valued on account of its variety of colours; the latter is a good plant for edgings.

N. linearis (linear). *fl.* purplish; lips of the corolla nearly equal; spur straight, shorter than the lips. April to September. *l.* linear-lanceolate, entire or few-toothed. Branches ascending. *h.* 2ft. 1822. Half-hardy perennial.

FIG. 582. NEMESIA STRUMOSA.

N. strumosa (strumose).* *fl.* very variable in colour, being white, ochreous, pale yellow, orange, scarlet, carmine, or rosy-purple; corolla 1in. across; raceme short, sub-corymbose. Summer and autumn. *l.*, radical ones oblong-spathulate, entire; cauline ones lanceolate or linear, toothed. *h.* 1ft. to 2ft. 1892. (B. M. 7272; G. C. 1892, xii., p. 269, f. 48; Gn. 1893, i. 900.) See Fig. 582, for which we are indebted to Messrs. Sutton, the introducers of the plant.

N. versicolor compacta (compact).* A compact, blue-and-white flowered form.

NEMOPHILA. The best variety of *P. insignis* is *grandiflora*, light blue with white centre, very effective and largely employed in bedding-out arrangements and for ribbon borders. There is also a dark blue variety of *N.* (*atomaria*) *Menziesii*, named *atrocærulea.*

NENGA. Four species are now referred to this genus. They have the characters of *Pinanga*, but the sepals and petals are sub-equal and subulate. *P. Wendlandiana* is the correct name of *N. pumila. N. sphærocarpa*, a native of New Guinea, is grown at Kew, but is not in general cultivation.

NEOBENTHAMIA (named in honour of George Bentham, joint author with Sir Joseph Hooker, of the "Genera Plantarum"; the prefix *neo* [new] serving to distinguish it from two previously founded, but abandoned, genera named *Benthamia*). ORD. *Orchideæ.* A monotypic genus. The species is a stove Orchid, allied to **Cymbidium** (which *see* for culture), but differing conspicuously in the shorter, hardly spreading perianth, and in the lip not being erect or embracing the column, but spreading from the base and slightly recurved beyond the middle.

Neobenthamia—*continued.*

N. gracilis (slender). *fl.* pure white, with two rows of reddish spots on the lip, nearly 1in. across; raceme short, erect, terminal, many-flowered. February. *l.* long-linear, acuminate, sheathing at base, recurved. Stems long, thin, tufted, Bamboo-like. Eastern tropical Africa, 1884. (B. M. 7221; G. C. 1891, x., p. 272, f. 33.)

NEOTINEA. Included under **Habenaria** (which *see*).

NEOTTIA. Several species formerly included here are now classed under **Spiranthes** (which *see*).

NEPENTHES. To the species and hybrids described on pp. 435-9, Vol. II., the following should be added:

N. amabilis (lovely). Pitchers mottled with dark crimson, freely produced. 1886. A garden hybrid between *N. Hookeri* and *N. Rafflesiana*, of good habit; it bears closer resemblance to the former parent.

N. Amesiana (Capt. Ames'). Pitchers green, prettily marked with red. 1893. A hybrid been *N. Rafflesiana* and *N. Hookeriana.*

N. Balfouriana (Balfour's).* Pitchers 1ft. long, deep red, with a few green spots and numerous spots and splashes of crimson. 1899. A handsome hybrid between *N. Mastersiana* and *N. mixta.*

N. Burbidgei (Burbidge's). A synonym of *N. Phyllamphora.*

N. Burkei (Burke's). Pitchers green, blotched with red, cylindrical, wingless, narrowed in the middle, 8in. long; mouth dark red, irregularly lobed, with a number of parallel nerves; lid ovate, obtuse. Borneo, 1889. (G. C. 1889, vi., p. 493, f. 69.)

N. B. excellens (excellent).* Pitchers larger and more richly coloured than in the type, being of a mottled bronzy-green, with a rich, deep bronze-purple margin. 1890. A capital plant for basket culture. (J. H. ser. iii., xxi., p. 161, f. 21.)

N. B. prolifica (prolific). *l.* narrower than in the type. Pitchers smaller, but very freely produced, mottled dull green, with a margin of orange-russet. 1890.

N. compacta (compact).* Pitchers produced in abundance, about 5in. long and 8in. in circumference, reddish-purple, sometimes shaded with violet, splashed and marbled with creamy-white, the margins and mouth creamy-white; lid spotted. 1881. A distinct plant, of compact habit.

N. Curtisii (Curtis'). *l.* sub-coriaceous, glabrous above, sparsely glandulose beneath, 8in. long. Pitchers about 8in. long, dull green, thickly mottled with purple, ascending, the throat shining; lid cordate-ovate, acute, about the size of the mouth of the pitcher, prettily marbled with purple on a pale ground. Borneo, 1887. (B. M. 7138; G. C. 1887, ii., p. 689.)

N. C. superba (superb).* Pitchers much darker than in the typical plant, and having a broad, purplish rim. 1889.

N. cylindrica (cylindrical). *l.* spreading, broadly oblanceolate-oblong, 8in. to 12in. long, narrowed into a winged petiole. Pitchers 6in. to 8in. long, 1in. to 1½in. in diameter, pale green, with a few scattered, crimson spots and markings, cylindrical, slightly inflated below the middle; mouth frilled; lid oval, with a depressed mid-nerve, horizontal or slightly fornicate over the aperture. 1887. A hybrid between *N. Veitchii* and *N. hirsuta glabrescens.* (G. C. 1887, ii., p. 521, f. 133.)

N. Dicksoniana (Dickson's).* Pitchers beautifully coloured, with a broad, rosy rim. 1888. A fine hybrid between *N. Veitchii* and *N. Rafflesiana*, intermediate in form between the two parents, and of robust growth. (G. C. 1888, v., pp. 541-3, f. 78.)

N. excelsior (advanced). Pitchers 9in. deep, richly mottled with purple-red and chocolate-brown on a light green ground, oblong, rounded at base. 1883. A hybrid between *N. Rafflesiana* and *N. Hookeriana.*

N. Findlayana (Findlay's). Pitchers pale green, mottled with reddish-crimson, medium-sized, produced in profusion. 1886. Garden hybrid.

N. formosa (beautiful).* A garden hybrid between *N. chelsoni* and *N. distillatoria.*

N. Harryana (Harry Veitch's). A hybrid between *N. villosa* and *N. Edwardsiana.*

N. Henryana (Henry Williams'). Pitchers about 7in. long, reddish-purple, variegated with green; throat light green, with violet spots; mouth crimson, shaded with violet; lip round, suffused with rosy-lake. A hybrid between *N. Hookeriana* and *N. Sedeni.* (I. H. ser. v. 15.)

Nepenthes—*continued.*

N. Hibberdii (Hibberd's). Pitchers blood-red, spotted with pale yellowish-green, green inside; lid green outside, indistinctly marked with dull red on the inside. 1883. Garden hybrid.

N. mixta (mixed). Pitchers about 8in. long, with a fringed wing, cylindric-oblong, pale cream-colour, flushed with green and blotched with red as in *N. Northiana*, ribbed round the mouth with deep crimson. 1893. A hybrid between *N. Northiana* and *N. Curtisii*; it was at first called *N. Northisii*. (G. C. 1893, xiii., pp. 46-7, f. 9.)

N. m. sanguinea (blood-coloured). A variety having the pitchers coloured dark reddish-brown. 1894.

N. nigro-purpurea (dark purple). *l.* leathery, glabrescent, acute at both ends. Pitchers dull purplish-brown, marked only by a few scattered, paler spots, pouch- or bag-shaped, 6in. long, 2½in. in diameter, with a few stellate hairs; wings rather broad, fringed with teeth; mouth obliquely ovate, bordered by a rim of purple or whitish ribs; lid purple, mottled on the lower surface, ovate-oblong. Borneo, 1882. Probably of specific rank. (G. C. n. s., xviii., p. 425.)

N. Obrieniana (O'Brien's). Pitchers long and narrow, the basal part green and slightly ventricose, the upper half cylindrical and reddish, the mouth having a green rim. Borneo, 1890. (I. H. 1890, p. 109, t. 116.)

N. Paradisæ (Paradise Nurseries). Pitchers rich crimson, marked with pale green, very much narrowed in the centre, 4in. to 5in. long, 2in. to 2½in. broad at the widest part, the edge of the throat and the inside of the lid green, the outside of the lid marked reddish. 1883. Garden hybrid.

N. Pervillei (Perville's). *l.* short, shining green, oblanceolate. Pitchers dull crimson, 2in. long. Seychelles, 1896. In a wild state, this plant produces leaves 1ft. long and pitchers 8in. long.

N. rufescens (reddish). *l.* 1ft. long, 2½in. broad, acute. Pitchers green, flushed with red, cylindric, 7½in. long, 2in. broad; lid oblong, spurred. Stem cylindric, reddish. 1888. A garden hybrid between *N. Courtii* and *N. distillatoria*. (G. C. 1888, iv., p. 669, f. 95.)

N. sanguinea (blood-red). A synonym of *N. Veitchii*.

N. stenophylla (narrow-leaved). *l.* narrow. Pitchers 6in. to 7in. long, 1½in. broad, green, with numerous longitudinal, dark reddish-purple spots; rim narrow; lid small. Borneo, 1890. Allied to *N. Curtisii*. (G. C. 1892, xi., p. 401.)

N. Tiveyi (Tivey's). Pitchers light green, streaked and blotched with bright brown; rim broad, bright reddish-brown, convex. 1897. A garden hybrid between *N. Veitchii* and *N. Curtisii superba*. (G. C. 1897, xii., pp. 200-1, f. 59, 60.)

N. ventricosa (swollen).* *l.* narrow, glabrous. Pitchers green, with a red rim, wingless, constricted in the middle, 6in. long. Philippine Islands, 1893. A distinct and striking plant, allied to *N. Burkei*. (G. C. 1893, xxiii., p. 380, f. 143.)

N. Vieillardii (Vieillard's). *l.* sessile, thick, lanceolate, slightly pubescent below. Pitchers oblong-ovoid, ventricose, 8in. long, hairy, with the sides winged and denticulate. Tendrils silky-white or ferruginous. Stem robust, obtusely trigonal, glabrous, slightly hairy at apex. New Caledonia, 1876.

N. Wittei (Witte's). A garden hybrid of which *N. Curtisii* is one of the parents, the other not being recorded. 1897.

N. zeylanica (Cingalese). A synonym of *N. distillatoria*.

NEPETA. To the species described on p. 439, Vol. II., the following should be added:

N. macrantha (large-flowered). *fl.* blue, showy, three to seven in shortly-pedunculate cymes; corolla 1½in. to 1½in. long; raceme elongated, lax. Summer. *l.* shortly petiolate, ovate-lanceolate, 2in. to 4in. long, serrate-crenate. Stems 2ft. to 3ft. high, erect, branched. Siberia. Perennial. SYN. *Dracocephalum sibiricum* (B. M. 2185).

N. Meyeri (Meyer's). A synonym of *N. micrantha*.

N. micrantha (small-flowered). *fl.* of a clear azure-blue, rather small; corolla hairy, with exserted tube; cymes opposite, many-flowered, forming a panicled raceme. Summer. *l.* petiolate, ovate, obtuse, crenate, rounded or sub-cordate at base. Stems erect, 6in. to 1ft. or more in height, simple or branched below. Orient. A pubescent annual. SYN. *N. Meyeri*.

N. spicata (spicate). *fl.* pale blue; spike oblong or cylindrical. September. *l.* petiolate, ovate- or triangular-cordate, 1½in. to 4in. long, coarsely crenate or serrated. Stems 1ft. to 3ft. high, with often spreading branches. Western Himalaya, 1878. Perennial. (B. M. 6405, a starved form.)

NEPHELAPHYLLUM. SYN. *Cytheris.* To the species described on p. 439, Vol. II., the following should be added:

N. cristatum (crested). *fl.* ½in. wide; sepals and petals green, with purple lines; lip white in front; scape 10in. long, few-flowered. *l.* cordate-ovate, 2in. long. Hong Kong, 1896.

NEPHELIUM includes *Scytalia*.

NEPHRODIUM. Buckler Ferns. Including *Pachyderis*, *Phlebigonium*, *Podopeltis*, *Proferea*, and *Pycnopteris*.

This genus includes many species remarkable for their decorative qualities, and others unequalled for their hardiness and power of endurance. Plants of all dimensions are found amongst Nephrodiums, from the tiny-growing *N. pedatum* and *N. sanctum*, with fronds only a few inches long, to the majestic *N. villosum* or the beautiful and massive *N. Boryanum*, both of which produce very handsome fronds from 4ft. to 6ft. and even frequently 8ft. in length. Whatever their size, however, Nephrodiums are all of easy culture, a property which market growers have not been slow in appreciating. Even the commonest of all, *N. molle*, which for years was considered no better than a weed, has sprung into commercial popularity. When specimens of this species are planted out on the rockery, where all Nephrodiums seem to thrive, they soon become objects of great beauty; but, whether grown in that way or as pot plants, they require a richer soil than most other Ferns.

All the Nephrodiums thrive in a mixture of loam and peat, which, for the most robust kinds, should be in about equal proportions, with a small part of cow-manure previously dried and well mixed together, and an additional sprinkling of silver-sand; for the smaller and consequently slower-growing species, less loam and more sand should be used.

Most Nephrodiums, especially the strong-growing kinds, are quite indifferent as to shading; a little sunshine acts as a strengthening agent, making their foliage much more lasting during the winter months than could otherwise possibly be the case. They all require a good supply of water at the roots all the year round, but principally during the growing season. Although they do not actually suffer from occasional waterings overhead, it is very doubtful if they derive any benefit therefrom: the foliage of many kinds, being of a soft texture, soon gets spotted and loses its beauty if allowed to remain in a wet condition for any length of time. In any case, the plants must not be kept close; confinement in the case of Nephrodiums means not only an invasion of Thrips, their greatest enemy, but also that brownness of mature fronds which often puzzles the amateur grower. The only way to avoid such unhealthy appearances is to grow the plants in well-ventilated houses, where moisture cannot condense on their foliage.

Nephrodiums are easily and rapidly propagated by means of their spores, which are abundantly produced and germinate very freely; the species provided with creeping rhizomes may also be increased by the division of these organs, which operation is most successfully performed during the months of March and April.

Considered as a purely British species, the beautiful *N. cristatum* is one of our rarest plants. Owing to its native places being boggy situations, it is, however, somewhat difficult to grow successfully for any length of time. As an outdoor Fern, if planted in peaty soil near the water, it will flourish as well as in its native habitat; but in less favourable situations it will become weaker every year, until it finally, in two or three years, dies.

N. decompositum is of comparatively easy culture, and is altogether a most desirable plant. It is usually of medium growth, exceedingly useful for table-decoration, and also for forming an edging in the rockery in front of taller kinds, as it is of a neat and compact habit. *N. d. glabellum* is well adapted for pot culture, or for planting in nooks in the rockery where there is but little soil or space at disposal. It is also a capital plant for Fern-cases, as generally seen in dwelling-rooms, where it grows luxuriantly, its tender, soft green colour forming a striking contrast with plants of a darker hue. The beauty of this variety is readily destroyed by watering or syringing overhead, which causes the fronds, young or old, to assume a brownish, sickly appearance.

N. erythrosorum is a highly decorative species, in many respects distinct, and deserves to be cultivated on a large scale. It has proved perfectly hardy even in London, having stood, without any protection whatever, the test of our hardest winters; but under such treatment it becomes deciduous. When treated as a cool indoor subject, its magnificent fronds, of a beautiful bronzy hue in a young state, but turning with age to a dark shining green, remain on the plant all the year round, and make

Nephrodium—*continued.*

it a very useful species for winter decoration. The whole plant is rendered exceedingly attractive by the bright red indusia, which contrast pleasantly with the dark glossy green of the upper surface of the frond. It is easily propagated from spores.

N. Filix-mas, when planted in naturally sheltered places, becomes almost an evergreen species, most useful for ornamenting the rockery and shrubbery. Like many other Ferns, it looks much handsomer when planted out, especially if disposed upon an irregular surface, in clumps of six or eight strong plants each, with a few pieces of stone or rock, which greatly add to their appearance, laid in between and among them. The male Fern is not, however, in any way fastidious, and will grow luxuriantly either in pots or planted out, in almost any soil, provided that during its growing season it receive a good supply of water at the roots; but it prefers a light and sandy loam to a stiff clay, and although it will bear exposure to the sun, yet it flourishes much better in a shady situation. It is readily propagated from spores, which are usually ripe about Midsummer; and also from division of the crowns, which is a much slower process.

N. hispidum is particularly adapted for growing in a Fern-case in the dwelling-room, where, in the company of Todeas and other Filmy Ferns, it will be found to thrive admirably; indeed, it is a plant rather difficult to manage in the open house, unless a close and shady corner can be devoted to it. Either as a pot plant or planted out it forms a beautiful and interesting object.

N. molle is a most accommodating plant, succeeding under either stove or greenhouse treatment. It does well either grown in a pot or planted out in the rockery, where it forms a capital background, showing off to advantage other and choicer Ferns, and in which position it soon multiplies, as it is readily propagated from spores. Several varieties of *N. molle* have been produced under cultivation, the most distinct being *N. m. corymbiferum*. On account of its curious form, its rapid growth, and its pleasing green colour, this variety has taken a leading place among the Ferns specially grown for decoration. When subjected to cool or intermediate treatment it is never, to our knowledge, attacked by any insect; it is only when grown in too warm a house that the plant is seen covered with Mealy Bug, which pest is only eradicated with great difficulty, as the texture of the fronds is very soft, and they do not bear fumigating or dipping in any insecticide.

N. montanum is most effective when planted in masses on the rockery; but it is one of the few species which do not take to transplanting very kindly, although, with a little care, it may successfully be removed. It also makes a handsome specimen when grown in a pot. In either case thorough drainage is necessary, and the soil best suited to its cultivation is a compost of four parts of fibry peat and one part each of leaf-mould and sandy loam, with a free admixture of silver-sand.

Though generally considered as an evergreen greenhouse species, *N. Sieboldii* is sufficiently hardy to withstand the severity of an English climate, as it is reported by Lowe to have survived the winter of 1854-55 in the open air, while it also withstood the rigours of the winter of 1889-90 unprotected, in the neighbourhood of London.

N. spinulosum is well adapted for the moist parts of the Fernery or the shady parts of the shrubbery, where, through its bold, free habit, it is rendered very distinct and decorative. The plant will bear a moderate degree of exposure, though it prefers shade; but, whichever situation it may occupy, a good supply of water at its roots is necessary all the year round.

To the species and varieties described on pp. 440-4, Vol. II., the following should be added:

N. affine (related). A synonym of *N. Filix-mas.*

N. atratum (dark). A synonym of *N. hirtipes.*

N. atrovirens (dark green). A synonym of *N. decompositum.*

N. Blumei (Blume's). A synonym of *N. intermedium.*

N. borneense (Bornean). *rhiz.* wide-creeping, densely scaly. *sti.* firm, erect, naked, 6in. long. *fronds* lanceolate, 1ft. to 1½ft. long, 4in. to 6in. broad; pinnæ 2in. to 3in. long, about 1in. broad, cut to a broadly-winged rachis into narrow-oblong, notched lobes. *sori* midway between the midrib and the edge; involucre persistent. Borneo. See Fig. 583. SYN. *Lastrea borneensis.*

Nephrodium—*continued.*

FIG. 583. PART OF FROND OF NEPHRODIUM BORNEENSE.

N. Boryanum (Bory's). *sti.* 2ft. to 3ft. long, stramineous or brownish, scaly. *fronds* 6ft. to 8ft. long, 2ft. to 3ft. broad; lower pinnæ 1ft. to 1½ft. long, 6in. broad; pinnules lanceolate, 3in. to 4in. long, cut to a winged rachis into blunt, spreading, more or less toothed lobes two to three lines broad; rachises and under-side naked. *sori* in rows near the midrib. Himalayas, &c. Greenhouse. SYNS. *N. divisum, Lastrea Boryana.*

N. Brunonianum (Brown's). *sti.* tufted, black, 4in. to 6in. long, densely dark brown scaly. *fronds* 1ft. to 1½ft. long, seldom more than 4in. broad; pinnæ close, unequal, oblong-lanceolate, blunt, cut half-way to the rachis into sharply-toothed, blunt lobes. *sori* abundant, midway between the edge and the midrib. Himalayas (at 12,000ft.). Greenhouse. SYN. *Lastrea Brunoniana.*

N. calcaratum (spurred). *sti.* densely tufted, stramineous, villous above. *fronds* 1ft. long, 3in. to 6in. broad; pinnæ spreading, 2in. to 4in. long, ⅓in. to ½in. broad, cut down two-thirds or more to the rachis into oblique, sub-falcate, linear-oblong, acute or blunt lobes; rachis villous. *sori* medial; involucre glabrous, persistent. India. A well-marked plant. SYN. *Lastrea calcarata.*

N. canum (hoary). *sti.* densely tufted, 6in. to 8in. long, slender, finely villous. *fronds* 8in. to 12in. long, 3in. to 4in. broad; central pinnæ 2in. long, ¼in. broad, gradually narrowed from base to point, cut nearly to the rachis into close, slightly crenate lobes ⅛in. broad; lower pinnæ distant and dwindling down gradually. *sori* sub-marginal; involucre thin, fugacious. Himalayas. SYN. *Lastrea cana.*

N. chinense (Chinese). *cau.* decumbent. *sti.* about 6in. long, slender, scaly. *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad; pinnæ few, the lowest much the largest, 5in. to 6in. long, 3in. to 4in. broad; lowest pinnules much longer than the others, which are lanceolate, with distinct, oblong-deltoid, deeply-pinnatifid lower segments, the under-surface almost naked. *sori* copious, distant from the midrib. North China and Japan. Greenhouse.

N. confluens (cohering). *fronds* deltoid, 1ft. to 1½ft. each way, tripinnatifid; lowest pinnæ the largest, deltoid, unequal-sided; pinnules large, lanceolate, the lowest deeply lobed; ribs densely hairy. *sori* large, disposed in one row near the main veins; involucre small, fugacious. Queensland. Greenhouse. SYNS. *Aspidium confluens, Sagenia confluens.*

N. coruscum (glittering). A synonym of *Aspidium varium.*

N. cristatum (crested). This resembles *N. Filix-mas*, but the fronds are less erect; the pinnæ less regular; the segments broader, thinner, more wedge-shaped on the lower side, much more toothed, and the lower ones sometimes almost pinnatifid, the plant then forming some approach to *N. spinulosum*, from which it differs in the much narrower fronds, with the segments much broader and much less divided. *sori* large, as in *N. Filix-mas*, with a conspicuous indusium. Europe (Britain), &c. SYNS. *Aspidium cristatum, Lastrea cristata.*

N. c. Clintonianum (Clinton's). A very vigorous form. 1883.

N. c. floridanum (Florida). *fronds* thickish, broadly lanceolate, pinnate, 1ft. to 2ft. high; sterile ones shorter, growing in a crown from a thick, scaly rootstock. A vigorous form.

N. c. uliginosum (marsh-loving). *fronds* broader than in the type; pinnules smaller and more numerous, more sharply pointed and more deeply cut, fringed with sharp teeth at their extremity. *sori* covering the under-surface. Hardier than the type. SYN. *Aspidium uliginosum.*

Nephrodium—*continued.*

N. cristatum-marginale (hybrid). A supposed natural hybrid between the parents indicated by its name. 1896. (G. & F. 1896, p. 444, f. 58.)

N. denticulatum (small-toothed). *sti.* tufted, 1ft. or more in length, densely scaly at base, naked above. *fronds* triangular, coriaceous, 1ft. to 2ft. long, 8in. to 12in. broad; lowest pinnæ much the largest; lowest pinnules the largest, lanceolate, the segments cut into spathulate lobes furnished with spiny teeth. *sori* scattered over the whole under-surface. Tropical America.

N. deparioides (Deparia-like). *sti.* firm, 1ft. or more in length, slightly scaly below. *fronds* oblong-lanceolate, 1½ft. to 2ft. long; lower pinnæ 4in. to 6in. long, lanceolate; pinnules unequal-sided, stalked, triangular, their broad, blunt, nearly quadrangular lobes distinctly toothed. *sori* terminal in the teeth (as in a Deparia). Southern India, &c. Greenhouse. SYN. *Lastrea deparioides.*

N. dilatatum (enlarged). A form of *N. spinulosum.*

N. divergens (diverging). A synonym of *N. effusum.*

N. divisum (divided). A synonym of *N. Boryanum.*

N. effusum (spreading).* *rhiz.* short-creeping, woody. *sti.* 2ft. or more in length, scaly below. *fronds* pale green, beautifully decompound, 4ft. long, 2ft. broad, four or five times pinnatifid; lower pinnæ the longest, 1ft. to 1½ft. long, often 1ft. broad; pinnules lanceolate, closely set; segments lanceolate, unequal-sided, the lower ones cut to the midrib into pinnatifid lobes. *sori* scattered over the under-surface, usually devoid of involucre. Mexico, &c. SYNS. *Polypodium divergens, P. effusum.*

N. elongatum (elongated). A variety of *N. Filix-mas.*

N. erythrosorum prolificum (prolific). *fronds* rigid, deltoid, bipinnate, deep green, gemmiparous in the axils of the segments and on the margins; pinnæ rather distant, obliquely ovate-lanceolate, the posterior side most developed; pinnules unequal, but usually linear, acute, and somewhat falcate. *sori* numerous, large, reniform, distributed over the whole back of the frond, covered by prominent indusia. Japan, 1883 An interesting variety.

FIG. 584. FROND OF NEPHRODIUM FILIX-MAS RAMOSISSIMUM.

N. Filix-mas. The following are well-marked forms: *athyrioides, Barnesii, Borreri, dentatum, elongatum, Findleyanum, foliosum, Ingramii, interrupta, Jervisii, Loweiæ, magnifica, Mapplebeckii, multi-cristatum, propinquum, ramo-cristatum, ramosissimum* (see Fig. 584), *ramosum, ramulosissimum, Scottii, Willisonii, Winstanleyi.*

N. glabellum (smoothish). A form of *N. decompositum.*

N. Grisebachii (Grisebach's). This gigantic, stove species is allied to *N. setigerum*, differing principally in its larger size and in its stipes being densely clothed at base with scales fully 1in. long, which leave distinct tubercles when they fall. Cuba.

N. hirtipes. SYN. *Aspidium atratum.*

N. Hopeanum (Lieut. Hope's). *sti.* 1in. to 1½in. long, grey, glossy, naked. *fronds* oblong-lanceolate, 1ft. long, 6in. to 7in. broad, bipinnatifid; pinnæ distant, sessile, caudate, the lower ones 3in. to 4in. long, ⅝in. to ¾in. broad, cut down to a narrow wing into ligulate-falcate, entire lobes ¼in. broad; tip of frond like one of the pinnæ; rachis grey, slightly pubescent. *sori* crowded close to the midrib; involucre firm, persistent. Polynesia, 1883. SYN. *Lastrea Hopeana.*

N. incisum (cut). *sti.* tufted, 2in. to 4in. long, scaly below. *fronds* narrow-oblong, 1ft. or more in length, ¾in. to 1½in. broad, coriaceous, finely hairy below, gradually narrowed towards the base, with triangular or lanceolate lobes often not reaching more than one-third the way to the rachis. *sori* nearly marginal; involucre very fugacious. West Indies and Colombia.

N. irregulare (irregular). A synonym of *N. latifolium.*

N. javanicum (Java). A synonym of *Didymochlæna polycarpa.*

N. Jenmani (Jenman's). *sti.* stout, scaly, erect. *fronds* bipinnate, about 2ft. long and 9in. to 12in. broad, densely pellucid-dotted. Jamaica, 1887. SYN. *Lastrea Jenmani.*

N. latifolium (broad-leaved). *sti.* ebeneous, 1ft. or more in length. *fronds* 2ft. to 3ft. long, 1in. to 1½in. broad, deeply pinnatifid at apex; pinnæ three to five on each side, the lowest (much the largest) 8in. to 12in. long, 6in. to 8in. broad, soft, greyish. *sori* disposed in rows, principally close to the main veins. Polynesia. SYNS. *N. irregulare, Sagenia irregularis.*

N. Lawrenceanum (Lawrence's). *cau.* 3in. to 4in. high. *sti.* (as well as the rachis and costa beneath) blackish. *fronds* 2ft. or more in length, gracefully arching, ovate, pinnate below, pinnatifid above; pinnæ falcate, pinnatifid, the lower ones about 1½ft. long. Madagascar, 1881. SYN. *Sagenia Lawrenceana.*

N. lepidum (pretty). *sti.* green, setose on the margins of the groove down the face. *fronds* ovate, acuminate; pinnæ alternate, very shortly stalked, lanceolate, acuminate, pinnatifid, the central ones longest, glabrous, with hairy midribs and setose margins. *sori* placed near the midribs on each side, with inflated, roundish-reniform, lead-coloured, hairy indusia. 1886. An elegant Fern. SYN. *Lastrea lepida.*

N. lucidum (clear). *rhiz.* short-creeping, with a few small, brown basal scales. *sti.* contiguous, 1in. to 3in. long. *fronds* oblong-lanceolate, bipinnatifid, glabrous, 1ft. to 1½ft. long, 5in. to 6in. broad; pinnæ twelve to twenty pairs, sessile, linear, pinnatifid. *sori* apical on the veins. Madagascar, 1877. Habit of *N. sophoroides.*

N. macrophyllum (large-fronded).* *sti.* tufted, dull brownish, 1ft. to 2ft. long, scaly below. *fronds* composed of a large terminal pinna (often forked at base) and from four to eight lanceolate ones on each side, entire or slightly lobed, the lowest pair distinctly forked at base. *sori* reniform, in two rows between each primary vein, and usually situated on the middle of a veinlet. West Indies, &c. SYNS. *Aspidium macrophyllum, Sagenia macrophylla.* There is a garden variety *calvatum.*

N. mamillosum (nippled). This species closely resembles *N. decurrens*; but the pinnæ are undivided, and the sori are so deeply immersed as to make the upper surface appear as if covered with minute nipples. Moluccas, 1886. SYN. *Sagenia mamillosa* (I. H. 1886, 598).

N. marginale. SYN. *Aspidium marginale.* In the variety *elegans* most of the pinnules are twice or thrice as long as in the type, and all are pinnatifid.

N. Maximowiczii (Maximowicz's). *sti.* light brown, glossy, scaly, 6in. to 8in. long. *fronds* smooth, deltoid, quadripinnatifid, about 1ft. each way; lowest pinnæ the largest, long-stalked, produced on the lower side; their lowest pinnules and segments deltoid, stalked, cuneate at base; the ultimate lobes unequal-sided, toothed. *sori* small, just below the final notches; involucre persistent. Japan. Greenhouse. SYN. *Lastrea Maximowiczii.*

N. molle. Several varieties of this species have been produced, including *polydactylon, violascens*, and *Sangwelli*, which last is of free growth, very ornamental for pots or for the rockery. 1884.

N. montanum Barnesii (Barnes'). *fronds* much narrower than in the type. A pretty variety.

N. m. coronans (crowned). A finely crested variety; the apex of the frond is developed into a large, crisped tuft, and the apices of the pinnæ have smaller, roundish, crisped ones. 1882.

N. nevadense (Nevada). Sierra Shield Fern. *rhiz.* creeping, slightly scaly. *fronds* pale green, 1½in. to 3in. long, including the short stipes; divisions of the pinnæ in the fertile fronds generally folded together early in the day, opening in the afternoon. *sori* close to the margins, covered with a minute, hairy indusium. Sierra Nevada, &c. Greenhouse.

N. opacum (opaque). This hardy garden plant has the appearance of a thick-leaved, dull form of *N. erythrosorum*, and is said to be Japanese; its fronds, however, never show the beautiful tints of the species named. It is rarely affected by gas, smoke, or fog. SYN. *Lastrea opaca.*

N. Oreopteris (Mountain Fern). A synonym of *N. montanum.*

Nephrodium—*continued.*

FIG. 585. FROND OF NEPHRODIUM PARISHII.

N. Parishii (Parish's). *sti.* slender, naked, 6in. to 9in. long. *fronds* deltoid, 6in. to 8in. each way; lower pinnæ much the largest; pinnules oblong-lanceolate, 1½in. to 2in. long, cut nearly to the rachis into close, crenate lobes of a parchment-like texture. *sori* in rows not far from the midrib. Moulmein. See Fig. 585. SYN. *Lastrea Parishii.*

N. polymorphum (of many forms). *rhiz.* creeping. *sti.* brownish, naked, 1ft. or more in length. *fronds* 2ft. to 4ft. long, 1ft. to 1½ft. broad, impari-pinnate; pinnæ five to thirteen, oblong, variously forked, especially the lower ones, coriaceous. *sori* small, abundant, scattered on the connected veinlets. Ceylon, Himalayas, &c. SYN. *Sagenia polymorpha.*

N. prolificum (prolific). A form of *N. erythrosorum.*

N. punctilobum (dotted-lobed). A synonym of *Dicksonia punctiloba.*

N. recedens (receding). *sti.* erect, 1ft. long, woolly-scaly. *fronds* 1½ft. to 2ft. long, 1ft. or more broad, deltoid; lower pinnæ 6in. to 12in. long, 3in. to 6in. broad, their pinnules often 6in. long, 2in. broad, and divided into distinct, one-sided, lanceolate segments, and close, slightly-toothed lobes, smooth above, woolly beneath. *sori* six to eight round the edges of the larger lobes. Ceylon, Neilgherries. SYN. *Lastrea recedens.*

N. recurvum (recurved). A synonym of *N. æmulum.*

N. remotum (distant). A variety of *N. spinulosum.*

N. Richardsi multifida (much-cleft).* A fine, free-growing, crested variety, useful for decorative purposes, and producing itself true from spores.

N. Rodigasianum (Rodigas').* *fronds* spreading, lanceolate, 3ft. to 4ft. long; pinnæ sessile, linear-lanceolate, pinnatifid. Samoa, 1882. A handsome species. (I. H. 1882, t. 442.)

N. scabrosum (rough). *sti.* slender, 1½ft. to 2ft. long, clothed with straw-coloured scales. *fronds* 1½ft. to 2ft. long, 1ft. to 1½ft. broad; pinnæ 6in. to 9in. long, 3in. to 5in. broad; pinnules of the lower side the largest, with lanceolate segments cut nearly to the rachis into toothed, ligulate lobes of a soft texture. *sori* small, usually one at the base of each lobe. Neilgherries. Greenhouse. SYNS. *Lastrea scabrosa, Polypodium nigrocarpum.*

N. Serra (a saw). *rhiz.* wide-creeping. *sti.* firm, glossy, 1ft. or more in length. *fronds* slender, 2ft. to 3ft. long, 1ft. or more in breadth, broadly lanceolate; pinnæ spreading, 6in. to 9in. long, seldom ½in. broad, cut down about half-way to the midrib into sickle-shaped, acute lobes, coriaceous, pale green. *sori* in two rows a little apart from the midrib; indusia hairy. Cuba, Mexico, &c.

N. setigerum (bristle-bearing). *rhiz.* creeping. *sti.* 1ft. to 2ft. long. *fronds* 1ft. to 3ft. long; lowest pinnæ largest, 8in. to 12in. long, 4in. to 6in. broad; pinnules narrow-lanceolate, cut down to the rachis into close, deeply-cleft, pale green lobes of a soft texture. *sori* small, eight to twelve to a lobe. China, India, &c. Greenhouse. SYNS. *N. tenericaule, Lastrea setigera.* In the variety *cristatum* the fronds are more or less crested.

Nephrodium—*continued.*

N. setosum (bristly). *sti.* tufted, 4in. to 6in. long, densely light brown-scaly. *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad; lowest pinnæ the largest; pinnules usually lanceolate, cut down to the midrib into long, narrow segments of a soft texture. *sori* in a line close to the midrib. Java. A distinct species. SYNS. *Aspidium setosum, Lastrea setosa.*

N. Sieboldii variegata. A variegated form of the well-known type.

N. simulatum (simulating). This species much resembles *N. Thelypteris*, but differs in its longer stipes, introrse lower pinnæ, larger sori, and less convolute margins. 1886. SYN. *Aspidium simulatum* (G. & F. 1896, p. 484, f. 69).

N. Sloanei (Sloane's). *rhiz.* stout, wide-creeping. *fronds* larger (3ft. to 4ft. long) and with narrower and more sharply-pointed lobes than in *N. patens*, which this stove species otherwise resembles. Tropical America. SYN. *Lastrea Sloanei.*

FIG. 586. NEPHRODIUM SPARSUM GRACILE.

N. sparsum gracile (slender).* *sti.* short, slender, conspicuously scaly. *fronds* lanceolate, bipinnatifid, 3in. to 4in. long. A pretty variety. See Fig. 586.

N. spinulosum Boottii (Boott's). *fronds* deep green, slightly scaly beneath, disposed in a circle or crown fully 3ft. high including the chaffy, rusty-scaly stipes; pinnæ lanceolate, distant; lowest pinnules ½in. long, ¼in. broad, cut one-third to half the way to the rachis. North America, &c.

N. s. dilatatum. The following are fairly distinct sub-varieties: *anomalum, collinum, compactum, crispum, cristatum, dentigerum, gracile, grandiceps, Howardii, nanum, ramosum, spectabilis, tanacetifolium.*

N. s. intermedium (intermediate). *fronds* broader than in the type (often 22in. long and 9in. broad) and more finely cut; pinnæ more spreading, the lowest nearly 3in. apart. North America.

N. Standishii (Standish's). This is a trade name for a beautiful Fern known correctly as *Aspidium lasercpitiifolium.*

N. subtriphyllum (almost three-fronded). *rhiz.* creeping. *sti.* brownish, 1ft. or more in length. *fronds* 1ft. to 1½ft. long, 8in. to 12in. broad, sub-deltoid, having a large, deeply-cleft terminal pinna, with lanceolate lobes, and one or two on each side. *sori* large, scattered on the connected veinlets. China, Ceylon, &c. SYNS. *Aspidium subtriphyllum, Sagenia subtriphylla.*

N. tenericaule (slender-stemmed). Synonymous with *N. setigerum.*

N. terminans (terminating). A synonym of *N. pteroides.*

N. Thwaitesii (Thwaites'). This closely resembles *N. dentatum* in general outline, but the small sori are marginal instead of terminal in the teeth of the lobes. Ceylon. SYN. *Lastrea Thwaitesii.*

N. undulatum (wavy).* *sti.* tufted, 6in. to 12in. long, scaly at base, glossy upwards. *fronds* 1ft. or more in length, broadly triangular-ovate; main rachis distinctly zigzag in

Nephrodium—*continued.*

outline; pinnæ deflexed, then curved upwards, overlapping; lowest pair usually the largest (4in. to 6in. long); pinnules nearly triangular, cut into broadly ovate segments. *sori* large, disposed near the midrib. Ceylon, &c. A distinct and elegant species. SYN. *Lastrea undulata.*

N. varium (variable). A garden name for *Aspidium varium.*

N. velutinum (velvety). *sti.* 1ft. or more in length, bright brown, villous upwards, scaly at base. *fronds* 1ft. to 1½ft. long, nearly as broad, deltoid; lower pinnæ much the largest, deltoid; lowest pinnules the largest, cut to the rachis below into pinnatifid, oblong lobes; rachises densely villous; both surfaces pubescent. *sori* small, copious; involucre glandular-ciliated. New Zealand. Greenhouse. SYN. *Lastrea velutina.*

N. Trimeni and *N. variolosum* (SYN. *Aspidium variolosum*) are grown in botanical establishments.

NEPHROLEPIS. Ladder Fern. Although not a large genus, this contains some of the most valuable Ferns adapted for planting on rockwork, a position in which they soon form ornamental masses of a striking and attractive character. All Nephrolepises are most tenacious of life, and when it so happens that, through want of moisture at the roots, their leaflets drop off, the plants soon recover; for, after a few weeks of attentive nursing, another crop of fresh foliage usually takes the place of the fronds previously destroyed. The fronds, which in some kinds attain 4ft. in length, are in most, if not in all, cases produced from crowns disposed at various intervals on long, thin, rapid-growing rhizomes of a wiry nature. This is a feature peculiar to the plants contained in this genus, and by which means most of them are rapidly increased, especially the reputed barren forms, such as *N. Duffii*, *N. rufescens tripinnatifida*, and the fertile but very variable *N. davallioides furcans*, which, when propagated from spores, produces plants showing their crested character in a more or less marked degree. Where it is desired that these should be increased, they should be planted in a shallow bed of coarsely-broken peat, chopped sphagnum, and silver-sand, in about equal parts: in this the rhizomes can freely run and produce young plants, which may be safely severed from the parent when they have developed three or four fronds. Besides the usual rhizomes already alluded to, a few species, such as *N. Bausei*, *N. cordifolia* (*tuberosa*), *N. philippinensis*, *N. pluma*, and *N. undulata*, are also provided at the roots with small tubers of a succulent nature, which likewise produce young plants in a remarkably short time. In this latter section *N. Bausei*, *N. pluma*, and *N. undulata* are entirely deciduous, and, from want of knowledge respecting their habit, have often been lost during their resting season, when some growers keep them so dry that, long before the time comes when they should start into growth again, the tubers have ceased to live. All through the winter, the soil which contains them must be kept in a moderately moist condition, so as to prevent them from shrivelling up: this is an essential point as regards securing a healthy, strong spring growth.

All the species of *Nephrolepis* are particularly well adapted for basket culture, being naturally of an elegant drooping character; they have also a curious propensity for taking possession of the outer surface of the baskets and growing all round them, thus making perfect balls of gracefully pendulous foliage, which, provided the plants are well supplied with water at the roots all the year round, remain a long time in perfect condition. On account of the jointed nature of their leaflets, the fronds are of little use in a cut state, as they only last good for a comparatively short time. The plants are specially useful for covering walls and pillars, as they require but very little soil and can almost be kept thriving on moisture alone. Many of them may be propagated from spores, which germinate freely and make young plants in a short time. *N. Zollingeriana* is best accommodated on a rockery in either a warm or an intermediate temperature.

N. davallioides furcans is valuable for growing in large baskets, in which it never fails to prove very attractive. Although spores are freely produced, it is best to propagate it by means of the young plants produced from rhizomes in the ordinary way, on account of the numerous and extreme variations which take place among the seedlings, a small percentage only of which are possessed of the true characters of the parent.

Nephrolepis—*continued.*

N. Duffii, being a totally barren plant, can only be propagated by division of the crowns, an operation easily performed at almost any time of the year, but with greater safety in early spring; or by young plants produced from the rhizomes, which, however, are not so plentiful as in other species. It is one of the best Ferns for pot culture, its somewhat upright habit making it less suitable than other species for baskets, brackets, and wall-coverings.

For indoor decoration, as well as for general use, *N. exaltata* has no equal, and being of a particularly accommodating nature it thrives well under other Ferns in places which possibly would otherwise remain bare. It is also well adapted for planting on a cool rockery, either in out-of-the-way corners or on rocks near water; but, wherever it is planted, care should be taken to give it plenty of room, so as to ensure the full development of its beautiful fronds. *N. exaltata* is a rapid grower, and soon forms very ornamental masses when planted out; but when left alone it has a tendency to overrun any more delicate Ferns which may happen to be near it.

N. pluma being thoroughly deciduous, care must be taken to keep its tubers, which are of a somewhat woody character and of a dark brown colour, in a constantly but moderately moist soil during the resting period, which corresponds with our own winter, otherwise they will shrivel up, and the plant will be lost. Like *N. cordifolia* and *N. pluma*, *N. undulata* produces small tubers, from which it can easily be propagated after its resting period. It is very scarce in collections, owing, doubtless, to its being of deciduous habit, which often causes it to be accidentally thrown away during its resting time.

FIG. 587. NEPHROLEPIS RUFESCENS TRIPINNATIFIDA.

To the species and varieties described on pp. 444-6, Vol. II., the following should be added:

N. Barteri (Barter's). A form of *N. exaltata.*

N. Bausei (Bause's).* *fronds* numerous, erect, more than 1ft. high, leafy from their base, and of a soft, bright green; pinnæ bipinnatifid. 1885. An ornamental Fern, of dense habit, suitable for basket culture. Garden variety.

Nephrolepis—*continued.*

N. cordifolia compacta (compact).* *fronds* arching, 1½ft. to 2ft. long, leafy from the base; pinnæ closely disposed, oblong, coriaceous, 1in. long, toothed, deep glossy green, with a darker midnerve. 1890. An elegant garden variety (distributed as *N. cordata compacta*), suitable for the intermediate house or stove. Other varieties in cultivation are *philippinensis* and *tuberosa*.

N. davallioides furcans plumosa (plumed).* *fronds* repeatedly forked at their summit, ending in large tassels of a crested and feathery nature. 1873. A very distinct form.

N. d. multiceps (many-headed). *fronds* light green, much-cleft, gracefully spreading. 1892.

N. exaltata neglecta (untrimmed). *fronds* 1ft. to 2ft. long; pinnæ cordate, cruciate, or triangular, distant, but much more securely attached to the rachis than in other kinds. This form is more suited for the rockery than for pots or baskets.

N. e. plumosa (feathery). In this variety the fronds are crested. 1890.

Other varieties are *Barteri* and *volubilis* (the last-named of zigzag form).

N. imbricata (overlapping). A synonym of *N. cordifolia*.

N. neglecta (untrimmed). A form of *N. exaltata*.

N. obtusifolia (blunt-leaved). A synonym of *N. cordifolia*.

N. philippinensis (Philippine Islands).* *fronds* narrow, seldom exceeding 1ft. in length, quite erect, produced from thickly-tufted crowns; midrib bright shining brown; pinnæ closely set, deflexed, dark green, coriaceous, auricled at base, finely toothed. Philippine Islands. A lovely stove or greenhouse species.

N. platyotis (broad-eared). A synonym of *N. acuta*.

N. recurvata (recurved). A garden synonym of *N. exaltata*.

N. rufescens (reddish). Of this ferruginous-tomentose variety there is a form in which the pinnæ overlap one another and are cut down, especially on the lower side, into deep, lanceolate segments, which (in the specimen figured in G. C. 1887, i., pp. 477, 431) are merely serrated, "but in a frond which lies before us [*tripinnatifida*] are again pinnatifid" (J. G. Baker). 1887. A free-growing, handsome Fern, either for pot culture or for planting out in a warm house. See Fig. 587, for which we are indebted to Messrs. W. and J. Birkenhead.

N. undulata (wavy).* *fronds* arching, seldom exceeding 1¼ft. in length, narrow-lanceolate; pinnæ narrow-oblong, acute, of a thin papery texture, notched at the edges, of a cheerful light green. West Africa, 1848. A very handsome species, especially when in fruit.

N. Zollingeriana (Zollinger's).* *rhiz.* freely produced, extending a long way. *sti.* terete, woolly, green at first, turning brown. *fronds* seldom more than 1½ft. long, of a cheerful green; pinnæ so deeply toothed as to appear pinnatifid. *sori* in a single row half-way between the midrib and the margin; involucre nearly round, fugacious. Malaya. A good rockery species for the warm or intermediate house.

NEPHTHYTIS. To the species described on p. 446, Vol. II., the following should be added:

N. picturata (pictured). *l.* spreading, 6in. to 12in. long, 5in. to 9in. broad, broadly ovate-hastate, deeply cordate at base

FIG. 588. NEPHTHYTIS PICTURATA.

Nephthytis—*continued.*

with a rhomboid sinus, cuspidate-acuminate at apex, variegated with white in a pattern resembling the tips of Fern fronds laid between the nerves; petioles 10in. to 12in. long, terete, erect, green. Congo, 1887. Stove perennial. See Fig. 588, for which we are indebted to Mr. Wm. Bull.

NEPTICULA. *See* **Rosa—Insects.**

NERIENE. *See* **Spiders.**

NERINE. Flowers pale or deep red, few or many in an umbel; perianth funnel-shaped, the segments more or less crisped; stamens inserted at the base of the segments; peduncle usually slender. To the species and varieties described on p. 447, Vol. II., the following should be added:

N. angustifolia (narrow-leaved). A form of *N. flexuosa*.

N. appendiculata (having an appendage). *fl.* in colour and size resembling those of *N. flexuosa angustifolia*, but the filaments have each at the base outside a strap-shaped process with two or four long, apical teeth (a new type of structure in the genus). 1894.

N. curvifolia Fothergilli (Fothergill's). *fl.* between crimson and scarlet, more numerous than in the type. The plant is more robust in all its parts. (A. B. R. 163, under name of *Amaryllis Fothergilli*.)

N. elegans alba (white).* *fl.* white, medium-sized, ten or a dozen borne in an umbel on an erect scape about 6in. high. *l.* bright green, 4in. long, ½in. broad. 1893. A beautiful dwarf plant, "said to be an introduction from South Africa, and therefore not likely to be a form of *N. elegans*, which is a hybrid of garden origin. It comes near *N. Moorei*." (J. H. xxvii., p. 349, f. 51.)

N. excellens (excelling). "A garden hybrid between *N. flexilis* [*?flexuosa*] and *N. humilis*." 1882.

N. flexuosa angustifolia (narrow-leaved). *fl.* pink; pedicels pubescent. *l.* linear, ⅛in. to ¼in. broad. 1885. A very distinct plant. (Ref. B. 329, under name of *N. pulchella angustifolia*.)

N. f. Sandersoni (Sanderson's). This differs from the type in the less-crisped perianth segments, which are more united in a cup at the base, the stouter pedicels and peduncles, and the broader leaves. 1885.

N. Fothergilli (Fothergill's). A variety of *N. curvifolia*.

N. humilis splendens (splendid). A variety having rosy-carmine flowers.

N. Moorei (Moore's). *fl.* six to nine; perianth bright scarlet, erect, the segments cut down to the ovary, oblanceolate, crisped, 1¼in. long, nearly ½in. broad; pedicels ⅜in. to 1in. long; peduncle about 8in. long. *l.* produced a little after the flowers, 9in. to 12in. long, ½in. to ⅝in. broad, curved, slightly twisted, blunt, thick and leathery, shining. 1886.

N. pancratioides (Pancratium-like). *fl.* white, twelve to twenty in an umbel; perianth 1in. long, with small, square, bifid scales between each of the filaments, as in *Pancratium*; scape 2ft. high. *l.* long, narrow, sub-terete in the lower half. 1891.

N. pulchella (pretty). A variety of *N. flexuosa*.

N. pumila (dwarf).* *fl.* of a brilliant scarlet, with a golden sheen, sixteen to eighteen in an umbel. *l.* appearing after the flowers, about 10in. long, channelled, glaucous, incurved, and spreading on the ground. 1890. A beautiful species, somewhat similar to *N. curvifolia*.

N. rosea (pink). A form of *N. sarniensis*.

N. sarniensis corusca insignis (remarkable). Deep rose, with white centre.

N. s. c. pallida (pale). An orange-scarlet form.

N. s. profusa (profuse). *fl.* bright scarlet; segments narrower and more acute, less wavy, and less falcate than in the form *venusta*. Late in August.

N. s. rosea (pink). *fl.* rose-red. *l.* darker than in the type. (B. M. 2124, under name of *N. rosea*.)

Hybrids. These in many cases quite out-distance the species alike as regards form and colour of flowers. Some excellent kinds have of recent years been produced by Mr. Elwes, Mr. Max Leichtlin, and others. The more important are included in the enumeration that follows:

ALLENI (*sarniensis* and *s. corusca major*); ATROSANGUINEA (*sarniensis Plantii* and *flexuosa*); CAMII (*curvifolia* and *undulata*); CINNABARINA (*Fothergilli* and *flexuosa*); COUNTESS BATHURST; ELEGANS (*flexuosa* and *rosea*); EXCELLENS (*flexuosa* and *humilis*); LADY BROMLEY; LADY CLEMENTINA MITFORD; LADY DORINGTON; LADY LAWRENCE; LADY LLEWELLYN; LADY LUCY HICKS BEACH; LADY MARY SHELLEY; MANSELLI (*flexuosa* and *curvifolia Fothergilli*); MEADOWBANKII (*sarniensis* and *Fothergilli*); MISS JEKYLL; MISS WILMOT; MRS. BERKELEY; MRS. DOUGLAS; MRS. GODMAN; MUTABILIS (*humilis* and *flexuosa pulchella*); NOVELTY, free and very late, one of the best; O'BRIENI (*pudica* and *Plantii*); ROSEO-CRISPA (*undulata* and *flexuosa*); STRICKLANDI (*curvifolia* and *pudica*); TARDIFLORA, and TARDIFLORA MAJOR

NERIUM. *N. coccineum* is synonymous with *Wrightia coccinea*. Rose Bay is a common name of *N. Oleander*, which is also known as *N. lauriforme*. *N. grandiflorum* is another name for *N. odorum*.

NERVATION. The arrangement of the nerves of a leaf.

NERVURES. The ramifications of the veins of leaves.

NESÆA includes *Decodon*.

NESOPANAX. Included under **Plerandra** (which *see*).

NESTRONIA. A synonym of **Buckleya** (which *see*).

NETTLE, HEDGE. *See* **Stachys.**

NETTLE - LEAVED MULLEIN. *See* **Verbascum Chaixii.**

NETTLE, STINGLESS. *See* **Pilea.**

NEUROCALLIS. *See* **Acrostichum.**

NEUROLOMA. Included under **Parrya** (which *see*).

NEUSTANTHUS. A synonym of **Pueraria** (which *see*).

NEUTER. Devoid of both stamens and pistils.

NEUWIEDIA (a commemorative name). ORD. *Orchideæ*. A small genus (five species) of stove, terrestrial Orchids, allied to *Selenipedium*, natives of Malacca and the Malayan Archipelago. Flowers small, nearly or quite sessile; sepals and petals equal, free, connivent or at length spreading; lip sub-spathulate, otherwise similar to the petals; column short; spike or raceme terminal, dense, simple, often elongated. Leaves long, contracted to the petioles. The two species introduced require similar treatment to the stove species of **Cypripedium** (which *see*).

N. Griffithii (Griffith's). *fl.* white, deflexed, ovoid, ¼in. long; spike shortly pedunculate, 4in. to 6in. long. September. *l.* 4in. to 10in. long, 1in. to 1½in. broad, erect, elliptic-lanceolate. *h.* 1½ft. Malacca. (B. M. 7425.)

N. Lindleyi (Lindley's). *fl.* pale primrose-yellow, 1in. long, decurved, almost cylindrical, shortly pedicellate; raceme 6in. to 12in. long, dense-flowered; scape 1ft. high, furnished with lanceolate bracts tipped with brown. Midwinter. *l.* numerous towards the base of the stem, 1ft. to 1½ft. long, 2in. broad, narrow-lanceolate. *h.* 3ft. to 4ft. Singapore, 1837. (B. M. 7368, flowers much too golden.)

NEVIUSA (named in honour of the Rev. D. R. Nevius, of Alabama, the discoverer of the plant). ORD. *Rosaceæ*. A monotypic genus. The species is a nearly or quite hardy, glabrous, slender shrub, with cylindric branches and very slender, puberulous, leafy branchlets, allied to *Kerria*. It thrives in ordinary garden soil, in sheltered positions, and may be propagated by cuttings.

N. alabamensis (Alabama). *fl.* 1in. in diameter across the spreading stamens, in terminal, sessile, sub-paniculate corymbs; calyx tube green, small, the five lobes ¼in. long, deeply toothed; stamens white, numerous, in many series; anthers yellow. May. *l.* alternate, petiolate, 1½in. to 3½in. long, membranous, pale green, ovate or oblong-ovate, acute or acuminate, usually doubly serrulate, puberulous; petioles ¼in. to ½in. long. Alabama, 1882. (B. M. 6805.)

NEWBOULDIA PENTANDRA. A synonym of **Oroxylum indicum** (which *see*).

NEW ZEALAND BLUEBELL. *See* **Wahlenbergia saxicola.**

NEW ZEALAND BUR. *See* **Acæna.**

NEW ZEALAND LABURNUM. *See* **Sophora tetraptera microphylla.**

NEW ZEALAND WATER-LILY. *See* **Ranunculus Lyalli.**

NICKER-TREE. A name applied to those species of *Cæsalpinia* which were formerly classed under *Guilandina*.

NICOTIANA. To the species described on pp. 450-1, Vol. II., the following should be added:

N. affinis is a synonym of *N. alba*.

N. Bigelovii (Bigelow's). *fl.* white, very freely produced, loosely racemose, opening at night; corolla tube 1¼in. to 2in. long, the limb 1in. to 1½in. across. *l.* oblong-lanceolate, sessile or nearly so; lower ones 5in. to 7in. long, the upper ones 1½in. to 3in. long. *h.* 1ft. to 3ft. California, &c., 1898 Annual.

N. colossea (colossal). A synonym of *N. tomentosa*.

N. macrophylla (large-leaved). A form of *N. Tabacum*.

N. noctiflora albiflora (white-flowered). *fl.* white. *l.* greyish-green, slightly hairy. 1898. (R. G. 1898, p. 131, f. 133.)

N. rustica (rustic). *fl.* lurid yellowish or greenish, thyrsoid, paniculate, opening in the daytime; corolla ¾in. long. July to September. *l.* ovate or the lower ones rounder and subcordate, very obtuse, often 1ft. long. *h.* 1ft. to 3ft. Probably indigenous to the Old World (naturalised in North America). A very viscid-pubescent annual.

N. sylvestris (wood-loving). *fl.* white, expanded in the daytime; corolla tube 3in. long, very slender, glandular-pubescent, the limb 1½in. broad; inflorescence almost hemispherical, formed of sessile fascicles. August. *l.* 1ft. or more in length, lyrate-obovate, semi-amplexicaul at base. *h.* 5ft. Argentina (at 6000ft.), 1898. A stout, branching, glandular-puberulous herb. (B. M. 7652.) A half-hardy annual.

N. Tabacum macrophylla (large-leaved).* *fl.* pale red, very large. *l.* as much as 16in. long, much undulated, ovate or cordate, acute. There are rose-purple and carmine-red flowered forms of this.

N. tomentosa (downy). *fl.* pinkish-white; corolla tube 3in. to 4in. long. *l.* 3ft. long, 20in. to 22in. broad, dark shining green, tinted with reddish-violet when young, ovate, acute, attenuated at base into large, wavy wings on the stout petioles. Stem stout, simple, as much as 7ft. to 10ft. high. Brazil, 1888. Greenhouse or half-hardy annual. (B. M. 7252.) SYN. *N. colossea*. There is a variegated form (*variegata*).

NIEBUHRIA OBLONGIFOLIA. A synonym of **Mærua oblongifolia** (which *see*).

NIEREMBERGIA. Cup Flower. *N. intermedia* is a synonym of *Salpiglossis linearis* (the correct name of *Petunia intermedia*), and *N. phœnicea* is identical with *Petunia violacea*.

N. frutescens atroviolacea (dark violet).* A handsome variety having dark violet flowers. *h.* 1ft. Half-hardy perennial. There is also a white form of *frutescens* known as WHITE QUEEN.

NIGELLA. *N. Garidella* is the correct name of the plant described on p. 452, Vol. II., as *N. Nigellastrum*.

N. damascena. Of this popular species there are azure-blue (*cælestina*) and white (*alba*) forms.

N. hispanica. Of this species there are dark purple (*atropurpurea*) and white (*alba*) forms.

NIGGERS. *See* **Athalia spinarum** (Vol. V.) and **Turnip Sawfly** (Vol. IV.).

NIGHTSHADE, MALABAR. *See* **Basella.**

NIGHTSHADE, THREE-LEAVED. *See* **Trillium.**

NIGHT-SOIL. A very powerful manure, composed of human fæces and urine, especially when taken from earth-closets, as all the fertilising constituents are saved, which is not the case when collected in tanks with large quantities of water present. Being so rich in plant-food, Night-soil should be applied to the soil in comparatively small quantities, particularly to growing crops, otherwise injury may follow its application.

NIGHT TEMPERATURE. Much of the success or failure of the gardener who has hot-houses or frames under his charge depends on the Night Temperature maintained. It is an accepted fact that the temperature in all such structures should be lower at night than during the day. Plants, like animals, must have periods of rest to make a sturdy, healthy growth; and if the Night Temperature is not allowed to fall below that of the day, the growth of plants, Vines, or other fruit-bearing trees becomes weak and thin, followed by ill-health. Again, high Night Temperatures induce an attack of Red Spider, Thrips, and a host of other animal and fungoid pests, the dry heat usually found therewith being specially favourable to such enemies.

NIGRITELLA. Included under **Habenaria** (which *see*).

NIMA. A synonym of **Brucea** (which *see*).

NIPHÆA. Eight species are now referred to this genus. To those described on. p. 453, Vol. II., the following should be added:

N. Roezlii (Roezl's). *fl.* small, in the upper axils, on long, glandular-hairy, purple pedicels. *l.* stalked, 1½in. to 2½in. long, ovate, obtuse, crenate, rugose, dark green. Tropical America. Plant dwarf, compact, covered with white or reddish hairs. (R. G., t. 896.)

N. rubida is the correct name of *Phinæa rubida*.

NITRATES. *See* **Nitrification.**

NITRIFICATION. Nitrification has an important bearing upon horticulture. Nitrogen in the form of nitrates is generally regarded as the best kind of nitrogenous food for plants of all descriptions. Nitrates are compounds of nitric acid with mineral bases, as potassium nitrate, sodium nitrate, calcium nitrate, and ammonium nitrate. Plants obtain their nitric acid by absorbing the nitrates that are already present in the soil—those that are carried down to the soil from the atmosphere in rain, dew, hoar-frost, and snow; those that are applied artificially in fertilisers; and those that are formed in the soil from the nitrogen of other substances.

As is well known, all the nitrogen that is applied to the soil for fertilising purposes, especially in farmyard and stable manures, compost heaps, in green-manuring, and by animal manures, is not in the form of nitrates. It may be either in the form of ammonia or of more complex organic compounds. It is very probable, however, that before it is taken up by the growing plant the organic nitrogen is changed, first into the form of ammonia, and then into nitric acid.

These changes all take place through the agency of micro-organisms, or ferments, in the soil, and that particular process in which the nitrogen of the ammonia is changed into nitric acid is called Nitrification. This change is accomplished by the joint action of two separate organisms, one of which changes the nitrogen of ammonia into nitrous acid, while the other changes the nitrous acid into nitric acid, the latter being the form in which it is assimilated by plants.

The conditions that are required for the development of nitrifying organisms are the presence in the soil of certain food-constituents—heat, moisture, oxygen, and some mineral base—to neutralise the nitric acid as it is formed. It is also necessary that the soil be slightly alkaline. The nitrifying organisms require certain substances as food, among which phosphoric acid and lime are most important. It has been found that without phosphoric acid there can be no Nitrification. This probably is one of the reasons why phosphatic manures show such beneficial results when applied to certain soils, as well as furnishing direct plant-food.

The three conditions which exert a marked influence on Nitrification, and which in horticultural practice are more or less intimately associated, are heat, air, and moisture. The process is most rapid during warm weather, in presence of sufficient air and moisture. Hence it is more active in summer than in winter, and more rapid in a conservatory or covered frame than in the open garden.

Nitrification also teaches the gardener the reason why thorough tillage of the soil is so essential, and why charcoal, added to potting material and a sufficiency of drainage crocks, in pot culture, is so important and beneficial. The loosening and pulverising of the soil allow the admission of the necessary oxygen, and regulates the supply of moisture. If the soil is allowed to become very dry, or, on the other hand, is saturated with water to the exclusion of air, Nitrification is retarded, and may be permanently stopped. In this connection it is interesting to note that in certain plant-cultures, especially that of the Chrysanthemum, if the soil is allowed to get thoroughly dry, the plants never afterwards seem to regain their former healthy vigour, nor will they produce such fine blossoms as if a steady and continuous growth is maintained.

The final product of Nitrification is nitric acid; but the nitrifying organisms cannot develop in the presence of a free acid; hence the benefit of liming sour soils, such as water-meadows, peaty soils, or very rich old garden soils. The lime corrects the sourness of the soil by neutralising the free acid, and then, if the other conditions of heat, oxygen, moisture, and food are favourable, Nitrification may proceed. There must be an

Nitrification—*continued.*

excess of lime applied over and above the amount necessary to correct the acidity of the soil in order to neutralise the nitric acid as it is formed.

Whenever the soil is in a condition unfavourable to Nitrification, there is danger that not only may nitrates not be formed, but that there will be a loss of nitrogen from those nitrates which are present. This loss is due to a process known as **Denitrification** (which *see*).

NOCCÆA (named in honour of Domenico Nocca, Professor of Botany at Pavia at the end of the eighteenth century). ORD. *Cruciferæ*. A genus embracing only two species of small, hardy, European herbs, allied to *Iberis*. Flowers white or lilac, sub-corymbose, bractless; sepals spreading; petals entire; scapes naked. Radical leaves crowded, pinnatisect. Only one of the species has been introduced. For culture, *see* **Biennials.**

N. stylosa (large-styled). *fl.* pale lilac; stamens, petals, and style about equal in length. *l.* slightly fleshy; lower ones petiolate, obovate-oblong, nearly entire; upper ones alternate, lanceolate, 1½in. long. *h.* 4in. South Europe, 1879. Biennial. SYN. *Iberis stylosa* (R. G., t. 1029, f. 3).

NOHL-KOHL. *See* **Kohl-Rabi.**

NOLANA ROSTRATA. A synonym of **Osteocarpus rostratus** (which *see*).

NOLI-ME-TANGERE. *See* **Impatiens Noli-me-tangere.**

NOLINA. *See also* **Beaucarnea.**

NOLTEA AFRICANA. This is the correct name of the plant described on p. 209, Vol. IV., as **Willemetia africana** (which *see*).

NONE-SO-PRETTY. *See* **Saxifraga umbrosa.**

NORDMANNIA CORDIFOLIA. A synonym of **Trachystemon orientalis** (which *see*).

NORMANDY CRESS. Another name for American or Land Cress (which *see* under **Cress**).

NORTENIA. A synonym of **Torenia** (which *see*).

NOTHOCHLÆNA. Gold and Silver Maidenhairs. Some of the members of this genus require stove temperature all the year round, while others succeed best under greenhouse treatment. In that respect they are like Gymnogrammes and Cheilanthes, which, on account of either the woolly or the golden or silvery nature of the under-side of their foliage, they also resemble in general appearance. Most of the plants belonging to this genus are of a somewhat delicate nature, requiring more than usual care, especially during the winter, to preserve their foliage, which, from its constitution, in many cases possesses the property of retaining moisture, and is therefore apt to decay. An important fact to notice is that, from whatever part of the globe they come, all the Nothochlænas are invariably found on rocks much exposed to the sun, but so situated that the plants get a good supply of moisture at the roots. The majority of the species are of erect or semi-erect habit, although a few are particularly well adapted for growing in baskets of small or medium dimensions, in which they display their elegant fronds to advantage. In any case they should not be kept in a close or a moist place, a somewhat airy situation being indispensable to all of them. If grown in pots, a mixture of good fibrous peat and small pieces of sandstone in about equal proportions is all that is required; but great care must be taken to ensure perfect drainage, as stagnant water at the roots is highly injurious. Finely-sifted soil should be carefully avoided, as also should overhead syringings.

Nothochlænas are almost invariably propagated from spores, which in some cases germinate freely; but many of the species may also be increased by division of the crowns, which operation is best performed from March to May.

Though considered somewhat difficult to manage, *N. lævis* is one of those plants which amply repay any extra care bestowed upon them. Whoever has had the good fortune of seeing it grown, as it was a few years ago, in the select collection of the late Mr. S. Rucker, where, under Mr. Pilcher's care, it formed a most handsome basket—the admiration of every visitor—will testify to the possibility of success. It only requires cool, or at the most intermediate, temperature and a dry position, such as a hanging-basket; and when grown in

Nothochlæna—*continued.*

this way the beautiful silvery under-side of its fronds is shown off to greatest advantage.

N. lanuginosa is well adapted for growing in the crevices of the cool rockery, where it should be planted with very little soil around it, and in an elevated and exposed situation.

N. Marantæ is seldom met with in anything like good condition, on account of its being usually grown in too much heat. It is a plant which not only prefers, but really requires, thoroughly cold treatment. The most convincing proof of this may be derived from the way in which it is grown, with signal success, by Messrs. J. Backhouse and Son, of York. Nowhere else, perhaps, is it brought to such perfection, and yet very little trouble is taken with it; all through the summer it is grown out in the open, and during the winter the plants are simply put into cold frames, where the frost often penetrates, and where they are protected only from excessive wet weather, which to this species is much more injurious than cold.

N. nivea is a most useful plant where baskets of small dimensions are required for the warm house—it should be kept very near the light, and in a position where no syringing is likely to reach it; while as a Fern for a medium-sized hanging-basket, *N. trichomanoides* has few equals, as its abundant fronds are most elegantly pendulous. It requires to be grown in a light compost of either fibrous peat or leaf-mould and silver-sand. We find that the intermediate house is the place where it thrives best, and where its fronds last the longest on the plant, provided they are kept perfectly dry at all seasons.

To the species, &c., described on pp. 455-6, Vol. II., the following should be added:

FIG. 589. FROND OF NOTHOCHLÆNA HOOKERI.

N. affinis (related). *sti.* tufted, glossy, nearly black, wiry, 2in. to 3in. long. *fronds* 4in. to 5in. long, 1in. broad, bipinnatifid; pinnæ short-stalked, triangular-oblong, ¼in. long, deeply cleft into close, entire lobes, coriaceous, densely matted below with sulphur-coloured meal. *sori* brownish, marginal. Mexico and Guatemala. Stove. SYN. *Cincinalis affinis.*

N. chrysophylla (golden-fronded). A synonym of *N. flavens.*

N. cretacea (cretaceous). A synonym of *N. sulphurea.*

N. dealbata (whitened). *sti.* densely tufted, 4in. to 6in. long, slender, wiry, chestnut-brown, rusty-scaly. *fronds* 3in. to 4in. each way, deltoid, tripinnate; pinnæ distant, the lower ones deltoid; lowest pinnules deltoid; lobes oblong, obtuse; texture sub-coriaceous; upper surface naked, pale green, the lower coated with pure white powder. Missouri. SYN. *Cincinalis dealbata.*

N. Fendleri (Fendler's).* *sti.* densely-tufted, wiry, chestnut-brown, glossy, 2in. to 3in. long. *fronds* tripinnate, broadly triangular; main and secondary rachises curiously flexuous; pinnæ, pinnules, and ultimate segments all distinctly stalked; upper surface glaucous, the lower one densely white-powdery. North America. A very ornamental species. SYN. *Cincinalis Fendleri.*

Nothochlæna—*continued.*

N. Gillesii (Gilles'). A synonym of *N. squamosa.*

N. Hookeri (Hooker's).* *rhiz.* short-creeping. *sti.* clustered, reddish-brown, smooth, shining, 6in. long. *fronds* star-shaped, five-pointed, about 3in. across; terminal pinna broadly triangular, stalked, the two lateral ones stalkless; under-surface copiously covered with powder varying in colour from white to orange. North America. This distinct species closely resembles *Gymnogramme triangularis.* See Fig. 589. SYN. *Cincinalis Hookeri.*

N. Hookeri (of Lowe). A form of *N. nivea.*

N. lævis (smooth). A synonym of *N. sinuata.*

N. Muelleri (Mueller's). *fronds* slender, 1ft. long, dark green with greyish spots on the upper surface, brownish below, having rounded, olive-green pinnæ covered with brownish scales. Habitat not recorded, 1888.

N. Parryi (Parry's).* *rhiz.* short, blackish-scaly. *sti.* slender, very dark, 4in. to 5in. long. *fronds* 5in. long, oblong-lanceolate, bipinnate, greenish-white and slightly hairy above, rusty-white and very hairy beneath; pinnules closely-set, very small, scarcely visible through the woolly covering; outer margin slightly recurved. *sori* very dark, in groups of three or four, forming a ring of about twenty joints. North America. A pretty species.

N. rufa (reddish). A synonym of *N. ferruginea.*

FIG. 590. FROND OF NOTHOCHLÆNA SULPHUREA CANDIDA.

N. sulphurea candida (white). *fronds* broadly triangular, bipinnate, 4in. long; lowest pinnæ having divided basal pinnules; under-surface covered with white or yellow ceraceous powder, except on the black, shining midribs. California. See Fig. 590.

N. tenera (tender). *rhiz.* chaffy with rusty-brown scales. *fronds* ovate, 3in. to 6in. long, tripinnate; pinnæ numerous, mostly opposite, rather distant, somewhat cordate, usually long-stalked, pale glaucous on both surfaces; pinnules entirely covered with dark brown sori. Chili, Bolivia, &c. (B. M. 3055.) SYN. *Cincinalis tenera.*

NOTHOSCORDUM. *N. inodorum* is a form of *N. fragrans* (SYN. *N. borbonicum*), and *N. striatellum* is a variety of *N. striatum.* *Milla macrostemon* is the correct name of *N. macrostemon.*

NOTODONTIDÆ. *See* **Moths** (Vol. II.).

NOTTINGHAM CATCHFLY. *See* **Silene nutans.**

NOTYLIA. To the species described on p. 457, Vol. II., the following should be added:

N. brevis (short). *fl.* white and yellow, minute, many in a short raceme. *l.* oblong, 4in. long. South America, 1895.

N. Bungerothii (Bungeroth's). *fl.* closely packed; sepals yellowish-green; petals linear-falcate, white, and having an orange spot at base; lip white, small, singularly rounded; peduncle long, densely racemose. *l.* nearly 9in. long, 2in. to 3in. broad. Pseudo-bulbs very large and broad, oblong. Central America, 1887.

N. laxa (loose). *fl.* greenish, the petals having orange spots at the base; racemes lax, elongated. *l.* cuneate-oblong-ligulate, acute. Brazil, 1892.

NOUELIA (named in honour of M. A. A. Nouel, Director of the Musée d'Orleans). ORD. *Compositæ*. A monotypic genus. The species, *N. insignis* (R. H. 1889, p. 229, f. 60) is a greenhouse or half-hardy shrub or small tree, with white, terminal urn-shaped flower-heads ¾in. long, and entire leaves 3in. to 8in. long, tomentose on their under-surface. It is a native of Yunnan, China, and in general aspect somewhat resembles the common Plum-tree.

NOWODWORSKYA. A synonym of **Polypogon** (which *see*).

NUCIFEROUS. Bearing nuts.

NUCIFORM. Nut-shaped.

NUPHAR. *N. minimum* is the correct name of the plant described on p. 458, Vol. II., as *N. pumilum.*

NURSERY. As usually understood, this term is applied to the grounds where quantities of trees, shrubs, and tender and hardy plants are propagated in large quantities for sale. In most large establishments a portion of the garden is set apart for the growth of hardy plants, trees, shrubs, &c., for the requirements of the place. This also is known as Nursery quarters. The forester also possesses, or should possess, a reserve part for the raising of trees and the growing on of stock for planting out on the estate.

NUT, GROUND. *See* **Apios tuberosa.**

NUTMEG, CALIFORNIAN. *See* **Torreya californica.**

NUTMEG - SCENTED GERANIUM. *See* **Pelargonium fragrans.**

NUT SAWFLY (*Cræsus septentrionalis*). Though oftener attacking the common Hazel of the woods or the hedgerow than the nuts of our gardens, yet at times the caterpillars of this Sawfly literally swarm on Cob Nuts. The larvæ are gregarious in their mode of feeding, and some half-dozen or so may be found upon a single leaf with their bodies bent over in the direction of the head gnawing away in a most voracious manner. Approach the tree and the insects at once begin to subject their bodies to most violent contortions, and this is continued while danger threatens. From the characteristic way in which they feed, and from the spasmodic jerking of their bodies, the insects should be identified by anyone. Moreover, their depredations are so much in evidence that the gardener could hardly fail to note them, for after the trees are attacked, there is nothing but the ribs of the leaves left to tell the tale.

As a further means of identification, it may be stated that in colour they are of a lovely bluish-green, except for the second and last segments of the body, which are deep yellow. Disposed over the body, but especially in the vicinity of the spiracles, are a number of black spots varying somewhat in size and shape. The perfect insects are on the wing in May, and the eggs are deposited on the veins of the leaves. Towards the end of June or beginning of July, according to the season, the larvæ appear, and as soon as full-fed they pupate in the soil.

As the larvæ feed exposed to view, it would be a good plan to shake the trees over sheets of paper covered with some sticky substance; while Paris Green (1oz. to 20 gallons of water) might be safely sprayed on to the

Nut Sawfly—*continued.*

infested trees, treating the soil beneath the trees in winter and early spring to a good dressing of soot and lime well "pointed" in.

NUTTALLIA (of Barton). A synonym of **Callirhoë** (which *see*).

NUT-TREE MITE (*Phytoptus avellanæ*). A near relative of the Currant-Bud Mite, and feeding similarly. Unlike the latter, however, it is kept in check by the pruning which the trees annually undergo. *See* **Hazel-Bud Mite.**

NYCTAGO (of Jussieu). A synonym of **Mirabilis** (which *see*).

NYCTERISTION. A synonym of **Chrysophyllum** (which *see*).

FIG. 591. NYMPHÆA ZANZIBARIENSIS.

NYMPHÆA. To the species and varieties described on pp. 459-60, Vol. II., the following should be added:

N. alba candidissima (whitest). A large-flowered form.

N. capensis (Cape of Good Hope). The correct name of *N. scutifolia.*

N. fennica (Finnish). *fl.* small; petals white, ten to fifteen, narrowly lanceolate, concave; stigmas five- to nine-parted, with yellow or violet-tipped lobes. East Finland, 1899. Hardy.

N. gracilis (slender). *fl.* white, large, handsome, star-like; fragrant, borne well above the foliage; petals acuminate; stigma twelve- to fifteen-rayed. *l.* somewhat orbicular-cordate; lobes rectangular, obsoletely repand-toothed. Rhizome very short, sub-globose. Mexico. Tender.

N. Kalmiana is a synonym of *Nuphar minimum.*

N. Lotus monstrosa (monstrous). *fl.*, buds usually transformed into tubers, which eventually form plants. *l.* more freely marked with dark brown than in the type. Lake Nyassa, 1896.

N. L. rubra (red). *fl.* deep red, freely produced; petals much broader than in the type. *l.* large, peltate, dark copper-coloured beneath. East Indies.

N. L. thermalis (thermal). The correct name of *N. thermalis.*

N. mexicana (Mexican). *fl.* brighter and deeper in colour than in *N. flava* (which this species closely resembles), freely produced; sepals and petals acute. *l.* ovate-sub-orbicular, cordate at base, crenate. Mexico, 1889. Half hardy.

N. micrantha is a form of *N. stellata.*

N. odele. A synonym of *N. stellata purpurea.*

N. Parkeriana (Parker's). This is described as having "the habit of *N. odorata*, and with large, pure white, fragrant flowers with yellow stamens." British Guiana, 1894. Stove.

Nymphæa—*continued.*

N. sphærocarpa rosea (spherical-fruited, pink). Apparently a pink form of *N. alba.*

N. stellata eastoniensis (Easton). A seedling variety, with numerous broad, deep blue petals. 1896. (G. & F. 1896, p. 474, f. 68.)

N. s. purpurea (purple). A handsome variety, with reddish-purple flowers. 1887. SYN. *N. odele.* (R. G. 1240, under name of *N. zanzibarensis flore-rubro.*) *Voalefoka* is a white variety. 1888.

N. tetragona (four-angled). The correct name of *N. pygmæa.*

N. thermalis is a form of *N. Lotus.*

N. tuberosa plena (double). *fl.* large and very full; stamens converted into petals.

N. t. rosea (rosy). *fl.* pale rose. Not so vigorous as the type.

N. zanzibariensis.* This, the darkest blue Water Lily known, is now regarded as a distinct species, and not as a form of *N. stellata.* See Fig. 591. (B. M. 6843.)

N. z. azurea (azure-blue).* *fl.* bluish-violet; filaments yellow; anthers violet. *l.* coarsely toothed, glossy, spotted with deep violet. 1897. (R. H. 1897, p. 323.)

N. z. rosea (pink). *fl.* varying from deep carmine to pink. *l.* shaded red beneath.

Varieties. Under **Aquatic Plants** (which *see*) were described a number of very distinct hardy kinds, including the best of the hybrids associated with the name of M. Marliac. There is, however, another section of the genus equally beautiful and desirable for those having houses for the culture of Aquatic Plants. A selection of these tropical and tender kinds will be found below. D. and N. indicate respectively Day- and Night-flowering.

FIG. 592. NYMPHÆA DAUBENYANA.

BOUCHEANA, flowers soft rose, slightly tinged with purplish-carmine, passing to a lighter hue at base of petals; leaves scalloped and sharply serrated at margin; free; *Lotus* and *Lotus rubra*; [N.]. DAUBENYANA (see Fig. 592), flowers blue, with yellow stamens tipped with blue, violet-scented, perpetual flowerer; *stellata* and *micrantha*; [D.]. DEANIANA, flowers rosy-pink, large; leaves bronzy; vigorous and free; [N.]. DEVONIENSIS (see Fig. 593), flowers rich deep red, very large; leaves large, bronzy-green, toothed at the margins; robust and free; *Lotus* and *Lotus rubra*; [N.]. EUGENIE, soft carmine-rose, paler at base; leaves dull bronzy-green on upper surface, blotched with reddish-brown, and margins serrated; shy flowerer; [N.]. KEWENSIS, flowers bright rosy-red, shading off lighter towards the base of petals, large and freely produced; *Lotus* and *Devoniensis*; [N.]. O'MARANA, flowers bright rosy-red; leaves bronzy, deeply toothed at margins; free; *dentata* and *Sturtevantii* (also a hybrid); [N.]. ORTGIESIANA, flowers bright rosy-red, with orange-red stamens; leaves bronzy-green on the upper surface, with prettily scalloped and serrated margins; vigorous and easily grown; *dentata* and *rubra*; [N.]. PULCHERRIMA, flowers light blue, remaining a long time expanded; vigorous and free; [D.]. STURTEVANTII, flowers bright rosy-red, cup-shaped, large, and broad-petaled; leaves bronzy on the upper surface, deeply toothed at the margins; shy flowerer; a beautiful plant; [N.]. THERMALIS, flowers white, with a pink tinge, faintly scented; [N.].

Nymphæa—*continued.*

FIG. 593. NYMPHÆA DEVONIENSIS.

NYSSA. To the species described on p. 460, Vol. II., the following should be added:

N. aquatica (aquatic). A synonym of *N. caroliniana.*

N. biflora (two-flowered). A synonym of *N. caroliniana.*

N. candicans (whitish). A synonym of *M. capitata.*

N. caroliniana (Carolina). *fl.*, fertile ones twin, on peduncles 1½in. to 2½in. long. April and May. *fr.* dark blue, the size of Peas. *l.* ovate-oblong, attenuated at base, entire, 3in. to 4in. long, glaucescent beneath. *h.* 30ft. to 45ft. North America, 1739. SYNS. *N. aquatica, N. biflora.*

N. grandidentata (large-toothed). A synonym of *N. uniflora.*

N. uniflora (one-flowered). *fl.* small, solitary. May. *l.* long-petiolate, ovate, acuminate, with two or three large teeth on one side only, woolly beneath, 5in. to 6in. long. *h.* 75ft. to 90ft. Florida, 1812. Probably the finest species of the genus. SYN. *N. grandidentata.*

OAK. In addition to the insect pests mentioned in Vol. II. as being injurious to Oak-trees, must be named several others which in certain seasons constitute themselves pests. These, too, are mostly enemies to the foliage, and pests which are, moreover, found upon many other trees, including those of the orchard, as well. Two of the most destructive are the Mottled Umber Moth and the Winter Moth. Their attacks may be modified by timely grease-banding. Several species of Sawflies, however, feed upon the foliage of the Oak, and these are more difficult to reach. *Emphytus serotinus* is a very common pest, and the larvæ may be found in late spring and early summer. They are about ½in. long, cylindrical, and of a lively green, with a powdering of a slightly lighter colour than that of the ground. If the parts of the trees infested could be reached with a powerful hose, the pests might be washed from the leaves and afterwards destroyed, as when alarmed they drop to the ground.

OAK FUNGI. The chief fungi infesting Oaks were dealt with in Vol. II. There are, however, a few others which are found upon Oaks as well as upon other trees. One of the most destructive is *Nectria ditissima*, already dealt with in connection with **Apple Canker.** In Germany especially, Oak-trees are attacked by *Stereum frustulosum*, which gives rise to the condition known as Partridge Wood, the discoloration having a fanciful resemblance to speckled white breast-feathers found upon that bird. Hartig says that at first the "wood assumes a deep red-brown colour, and then white blotches on a dark ground make their appearance, which stand in a certain relationship to the large medullary rays." Eventually the characteristic white blotches decompose, forming perforations, and the mycelium may be noticed.

Oak Fungi—*continued.*

The remedy lies in cutting out the diseased portions and coating the parts with a tar preservative. So far this fungus has not been found in England. A near relative, however, *S. hirsutum*, is very common here, and is responsible for a rotten condition. Being alike a saprophyte and a parasite, it is especially objectionable, in the latter case gaining access through a wound. The sporophores are variable as to shape, and very tough, with wavy edges, while the upper surface is hirsute. All dead wood should be removed. The diseased portions should be cut out, then treated to a solution of bichloride of mercury (*a virulent poison, and exceedingly corrosive*), and coated with tar. Oak-root Fungus (*Rosellinea quercina*) is peculiar to seedling Oaks, and therefore of moment to the forester and the nurseryman. Hartig, who has devoted some considerable study to this fungus, which is very prevalent in some parts of the Continent, says that it spreads very rapidly during wet summers. Its presence is readily indicated by the leaf condition, which is unhealthy, and by the presence of the strands of white or (later) brown mycelium attached to the roots and traversing the soil in search of other host-plants, and by the black sclerotia. Conidia are produced upon the mycelium, and by these the fungus is developed in summer; while perithecia, from which are evolved ascospores, are also present, and by these the fungus is reproduced in the spring of the next season. All infested seedlings should be uprooted and burned, and the spread of the disease should be prevented by the digging of trenches.

OAK-LEAF GERANIUM. *See* **Pelargonium quercifolium.**

OAK-LEAF ROLLER MOTH (*Tortrix viridana*). This Common Moth will be found described under **Tortrix** (Vol. IV.), and also under **Oak** (Vol. II.). The caterpillars are very familiar, as they may be found by thousands in certain seasons suspended in mid-air, having let themselves down from their spun-together cylindrical retreat. They vary considerably as to colour. At first they are greyish, but as they get full-fed they assume a greenish colour. These pests usually undergo the final change in the tubes which they have ingeniously constructed; but circumstances frequently arise which practically compel them to take shelter in the bark of the Oaks on whose foliage they have fed. Then they lightly cover themselves with a thread-like substance which they spin.

So numerous are these foes in our woods and plantations that the trees are often quite defoliated. So far, no really practical remedies have been devised for dealing with the insects; while the fact that the Oak produces a second crop of sound leaves tends to show that the trees are not seriously injured.

OAK-ROOT FUNGUS. *See* **Oak Fungi.**

OAK, SHE. *See* **Casuarina stricta.**

OBERONIA. To the species described on p. 465, Vol. II., the following should be added:

O. acaulis (of B. M.). The correct name is *O. ensiformis.*

O. Myosurus (Myosurus). *fl.* buff, minute, in a dense spike less than ½in. long; scape very short and stout. *l.* radical, 3in. to 4in. long, ⅛in. in diameter, terete, curved. Nepal, Birma, &c., 1896.

O. rufilabris (red-lipped). *fl.* yellow, ultimately changing to light red, with a reddish-brown lip, minute, in dense whorls; scape and raceme together 1in. to 2in. long, the latter nodding. *l.* 1in. to 1½in. long, thin, narrow-oblong. Birma, 1881.

OBLONG WEEVIL (*Phyllobius oblongus*). *See* **Phyllobius,** Vol. III.

OCA. The native name of the edible tubers of *Oxalis tuberosa* in Bolivia, where they are used like Potatoes.

OCHROPTERIS. *O. pallens* is a beautiful and very rare Fern, having the general habit and texture of an ample-fronded and much-divided *Davallia.* The plant requires an abundance of heat and moisture all the year round, and a compost of three parts peat, two parts sand, and one part loam. Like the majority of Ferns from the same habitat, it is averse to strong light. We are not aware that this interesting plant has ever been raised from spores either in this or in any other country in Europe.

OCIMUM. To the species described on p. 467, Vol. II., the following should be added:

O. comosum (tufted). *fl.* blackish-purple. *l.* bright green. Habitat not recorded, 1889. An annual, in the way of *O. Basilicum*, of which it is probably a variety.

O. gratissimum (very grateful). *fl.* pale yellow, very small; racemes erect, slender, the whorls rather closely set. July and August. *l.* glabrescent, ovate, acute, 2in. to 4in. long, crenate or coarsely toothed; petioles 1in. to 2in. long. *h.* 4ft. to 8ft. India, &c., 1751. Shrub.

O. minimum is a form of *O. Basilicum.*

O. suave (soft). This mainly differs from *O. gratissimum* in having the leaves densely and softly tomentose on both surfaces. Africa, 1816.

OCOTEA includes *Strychnodaphne.*

OCREA. The correct spelling of **Ochrea.**

OCTA-, OCTO-. Eight; *e.g.*, Octomerous, eight-parted.

OCTADESMIA. *O. serratifolia* is the correct name of the plant described on p. 467, Vol. II., as *O. montana.*

OCTOMERIA. To the species described on p. 467, Vol. II., the following should be added:

O. cochlearis (snailshell-like). *fl.* bent sideways; sepals and petals whitish-ochre, tailed; lip trifid, hairy, light sulphur, with a purple blotch on the disk. *l.* strong, cochleate, glaucous, purple beneath, with numerous transverse furrows. Brazil, 1881.

O. diaphana (diaphanous). *fl.* white, transparent, scentless, solitary; sepals and petals very acute; lip three-toothed, the margins slightly crisped. *l.* ovate, convex, acute. Upper part of the stem invested with large sheaths. Brazil. A small but pretty species.

O. supraglauca (glaucous above). *fl.* ⅓in. long; sepals and petals pale glassy-green, faintly tinted purplish outside, lanceolate, acuminate; lip one-fourth as long as the sepals and petals, obtuse, yellowish, with a large, lurid-purple blotch; peduncles bearing two or three flowers. *l.* elliptic, fleshy, whitish-green above, beneath dark green, obscurely tessellated with dark purple, and minutely furrowed. *h.* about 2in. Brazil, 1837. Plant tufted.

Several other species are grown in botanical establishments, but they are of little or no horticultural value.

OCTOMERIA (of D. Don). A synonym of **Eria** (which *see*).

ODONATA. *See* **Dragonflies.**

ODONOPTERA BIDENTATA. The caterpillars of this common Moth are frequently met with in gardens, feeding upon a variety of trees and shrubs—Hazel, Birch, Ivy, chiefly. To the last-named they are often very destructive. The Moth is over 1½in. in wing expanse, and may be found during May and June. The caterpillars are feeding during July, August, and September; they are not readily found, however. In colour they are a light grey, or brown, with darker markings upon the back; sometimes, too, they are blackish, with pale greenish markings. When full-fed they pupate just below the surface of the soil, or beneath any rubbish likely to afford the necessary shelter, the perfect insects appearing the following season. When Ivy is badly attacked the food plant should be poisoned with Paris Green, 2oz. to the gallon of water.

ODONTOCARPA. A synonym of **Valerianella** (which *see*).

ODONTOGLOSSUM. No Orchids have been so extensively imported as the *O. crispum* section of Odontoglossums. In many of these importations startling novelties have appeared; and several supposed natural hybrids between the different species which are known to grow together have also been introduced, and in many instances they have proved desirable additions to these charming plants. The "garden hybrids" have been useful, inasmuch as they have determined the identity and origin of some of the natural hybrids. In other instances, but especially in those hybrids which have been procured through the influence of *O. Harryana* as one of the parents, distinct and desirable additions have been made. The raising of Odontoglossums from seed is now being extensively practised, and frequent additions may be expected in the near future.

One of the principal details in the culture of the cool section of Odontoglossums in the past was the supposed necessity for having a house with a northern aspect, or

Odontoglossum—*continued.*

one in which strong sunlight could be avoided. The modern system of culture altogether disposes of the idea of dull surroundings and dense shade, and span-roofed houses, built in such a manner that a constant circulation of fresh air is admitted at all times when the external conditions are favourable, are now found to be the most suitable. The heavy shading also formerly in use has been replaced in almost all the establishments where these plants are well grown, by open wood lattice roller blinds, so that while the sun's rays are broken a clear bright light is admitted. These blinds, being raised some distance from the glass, permit the air to circulate freely, with the result that considerably cooler conditions can be maintained in the interior of the houses.

O. Harryana and its hybrids do best when grown in a temperature a few degrees warmer than the ordinary Odontoglossum-house temperature. They should not be allowed to be in a lower temperature than 50deg. even in winter. If cultivated with the other Odontoglossums they are liable to become spotted and permanently disfigured during the winter months. They succeed well at the warm end of the Odontoglossum-house through the hotter months of the year.

Other species formerly included hereunder are now referred to **Gomeza** and **Miltonia.**

O. angustatum (narrowed). *fl.* in erect, shortly branched panicles; sepals greenish, with a brown mid-line, linear, very acuminate; petals yellow, transversely barred cinnamon-brown, broader than the sepals, crisped; lip white, the anterior part oblong-triangular, wavy, toothed, with brown streaks and bars, a crest of two serrated lamellæ, one middle keel, and a tooth on each side of it. Pseudo-bulbs pyriform, ancipitous, each with one broadly lanceolate leaf from its apex, and about four accessory ones at its base. Peru. (B. O. 26.) SYN. *O. claviceps.*

O. angustatum (of Bateman). A synonym of *O. ramosissimum.*

O. apterum (wingless). *fl.* white, with roundish, purple spots collected near the base; lip having a fleshy, two-lobed claw, with a pair of diverging teeth in front, and a crenate limb; scape few-flowered. March. *l.* broadly lanceolate. Mexico. (B. O. 1.)

O. aspidorhinum (buckler-nosed). *fl.* of a clear yellow, blotched more or less with reddish-brown; spikes pendent. *l.* stiff, cuneate-oblong. Pseudo-bulbs long-ovoid. Colombia, 1895. Plant dwarf, tufted.

O. astranthum (star-flowered). *fl.* nearly 2in. across, the organs stellately disposed; sepals and petals yellowish, streaked and blotched purplish-brown; lip white, spotted pale rose, ligulate, acuminate in front, the base of the column orange, with a few reddish-purple spots; panicle branching, upwards of fifty-flowered. Summer. Ecuadorean Andes. Something like *O. odoratum.*

O. aureo-purpureum (golden and purple).* *fl.* golden-yellow, marked with purple, 2in. across, disposed in a very large, stiff, much-branched panicle. *l.* flat, lanceolate, acute, narrow. Stem 6ft. high. Peru and Venezuela. A noble species.

O. baphicanthum (dyed-flowered). A variety of *O. odoratum.*

O. bictonense roseum (rosy). *fl.*, sepals and petals brown; lip deep rose. *O. b. rubrum* is probably synonymous with this.

O. blandum blepharicantham (fringe-flowered). *fl.* white, with golden-brown markings.

O. Boddaertianum (Dr. Boddaërt van Cutsem's). *fl.*, sepals and petals yellow, marked with dark cinnamon, lanceolate, acuminate; lip white, the basilar lobes semi-ovate, erect, dotted mauve-purple, the median lobe with small, spreading basilar angles; column whitish-yellow, spotted brownish-purple. Venezuela. Allied to *O. odoratum.*

O. Bowmanni (Bowmann's). A. form of *O. crispum.*

O. Brandtii (Brandt's). *fl.*, sepals straw-yellow, spotted with maroon in the basal half; petals straw-yellow, with a maroon band at base and a central spot; lip white, with red spots; crests two, horn-like. Colombia, 1889. Allied to *O. Lindleyanum,* of which it is perhaps a variety. (R. G. 1889, t. 1303.)

O. Brassia (Brassia-like). A synonym of *O. odoratum deltoglossum.*

O. cærulescens (bluish). A synonym of *O. Rossii.*

O. Cervantesii roseum (rosy). *fl.* pale rose-coloured.

O. chiriquense (Chiriqui). A variety of *O. coronarium.*

O. cinnamomeum (cinnamon). A synonym of *O. Schilleri-anum.*

O. citrosmum sulphureum (sulphur).* *fl.*, sepals and petals suffused with rose-purple. A distinct form. 1894.

O. claviceps (club-headed). A synonym of *O. angustatum.*

Odontoglossum—*continued.*

O. confertum (clustered). *fl.*, sepals and petals pale cinnamon, dotted with ochre inside, light brown outside with a green keel, deep orange at apex, surrounded by a violet-purple border partly composed of spots; lip light yellow; panicle dense, with zigzag branches. *l.* two, ligulate, acute, 1ft. long. Pseudo-bulbs long-pyriform, 3½in. long. Ecuador, 1879.

O. constrictum castaneum (chestnut-brown). *fl.*, sepals and petals brown, having one or two greenish-white lines at the base. 1885.

O. coronarium chiriquense (Chiriqui). *fl.* paler and larger than in the type; sepals chestnut-brown; petals yellow, with some brown markings; lip yellow, with a brown blotch on the disk. Chiriqui. SYN. *O. chiriquense.*

O. c. miniatum (scarlet). *fl.* smaller than in the type; sepals and petals chestnut-brown, bordered yellow; lip yellow; inflorescence denser. Pseudo-bulbs more closely placed. Ecuador. SYN. *O. miniatum* (of gardens).

O. crinitum sapphiratum (sapphire).* A fine variety, having the white lip covered with light mauve-bluish spots. 1886.

O. crispum apiatum (bee-like). *fl.*, all the segments marked with one large brown blotch and two smaller ones, the sepals stained violet-purple. 1886.

O. c. apiculatum (apiculate).* A beautiful pure white-flowered variety.

O. c. aureum magnificum (golden, magnificent).* *fl.* creamy-yellow, 3in. across; sepals and petals blotched chocolate-red; spikes stout, erect, branched at base. 1883.

O. c. Ballantynei (Ballantyne's). *fl.*, sepals and petals having a large, sanguineous-purple blotch in the centre; lip with large, reddish-brown spots around the crest.

O. c. Bowmanni (Bowmann's). *fl.*, sepals white, flushed and blotched deep rose; petals white, spotted rose towards the base; lip broadly hastate, with four or five reddish-brown spots and a large yellow disk. Colombia. SYN. *O. Bowmanni.*

O. c. Brymerianum (Brymer's).* *fl.*, ground colour faintish rose, edged with silvery-white, spotted with light brown. A superb form.

O. c. Crawshayanum (De B. Crawshay's).* *fl.* pure white, heavily spotted and blotched with rich scarlet, large, star-like. 1897.

O. c. Cutsemianum (Dr. Boddaërt van Cutsem's). *fl.* white, spotted red, large, with broad, toothed petals.

O. c. Dayanum (Day's). *fl.*, sepals with an irregular, central, mauve-purple blotch; petals with one or two circular spots and a streak at the base; lip white.

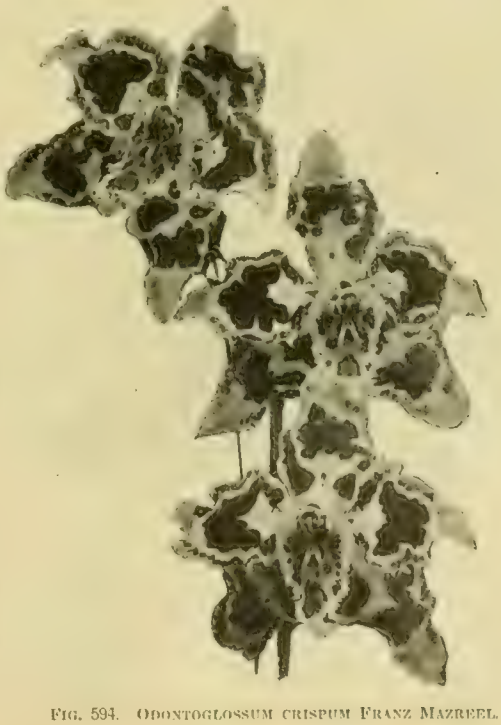


FIG. 594. ODONTOGLOSSUM CRISPUM FRANZ MAZREEL.

Odontoglossum—*continued.*

O. c. Franz Mazreel.* *fl.* whitish, blotched with blood-red and crimson. 1895. See Fig. 594.

O. c. Hrubyanum (Hruby's). *fl.* large, the whole of the central area of the very broad sepals and petals occupied by a brown blotch. Colombia. (R. ser. i., t. 23.)

O. c. hyperxanthum (extra-yellow). *fl.*, sepals with a few light yellow spots; petals white, rhomboid, serrated; lip and column yellow. 1887.

O. c. Kinlesidianum (Rev. R. Kinleside's). *fl.*, sepals and petals rosy-white, the petals with three series of crest-like teeth on the face; lip white, with a yellow disk, some red spots around it, and radiating lines at the base. 1888. (R. ser. i., t. 45.)

O. c. Massangeanum (Massange's).* *fl.* large, beautifully crisped, heavily blotched with deep crimson. 1894. A brilliant form.

O. c. Prince of Wales.* *fl.* 4½in. across; sepals and petals pure white, with a faint tinge of rose in the sepals; lip extra large, white, with golden disk and three or four reddish-brown spots where the disk ceases. 1898.

O. c. purpurascens (purplish).* *fl.* having a suffusion of purplish-rose and strewn with red spots. 1899.

O. c. Reginæ (The Queen's). *fl.* white, evenly spotted reddish-brown, the disk of the lip yellow. Colombia. (W. O. A. vi., t. 264.)

O. c. Schrœderi (Baron von Schrœder's). *fl.*, all the segments with one deep, large, reddish-brown blotch (or sometimes two) and two or three smaller ones; in addition to these, several reddish-brown spots are scattered over the remaining white area.

O. c. Scottii (Scott's). *fl.* creamy-yellow, large and showy; sepals entire, with large, bold spots of chestnut-brown; petals coarsely toothed, with fewer and smaller spots near the base; lip having prominent, yellow crests. *l.* ligulate. Pseudo-bulbs flat, ovate. 1883.

O. c. Shuttleworthii (Shuttleworth's). *fl.*, sepals and petals broad, white, heavily blotched with chocolate-brown; the lip blotched and fringed.

O. c. splendens (splendid). *fl.* white, tinged rose; sepals with a brown blotch in the centre and several smaller ones at base; petals spotted brown at base; lip with a large, central, brown blotch and some small brown spots on each side of the base, which is yellow, with some radiating, dark red lines.

O. c. virginale (virgin-white).* *fl.* pure white, the lip marked with one or two small dots and having yellow on the disk. 1882. A handsome variety.

O. c. Wilsoni (Wilson's). *fl.* very delicate blush, very large; petals broad, fringed; sepals and lip having a few chocolate spots. 1882.

O. c. Wolstenholmiæ (Mrs. Wolstenholme's). *fl.*, sepals and petals pure white, spotted ochre-brown in the centre, bordered mauve, very acuminate, the petals lobed and toothed; lip having a brown, ligulate disk and yellow calli; column yellow at base. 1887.

O. c. zebrinum (zebra-striped).* *fl.* whitish with a creamy suffusion, spotted and barred with reddish-brown, 2½in. across. 1898.

O. cristatellum (slightly crested). A variety of *O. cristatum.*

O. cuspidatum (cuspidate). A variety of *O. luteo-purpurcum.*

O. Dawsonianum (Dawson's). A garden synonym of *O. Rossii Ehrenbergii.*

O. Dayanum (Day's). *fl.* large; sepals and petals creamy-white, profusely spotted with cinnamon-brown; lip white and pale mauve. Origin not recorded, 1897. Allied to *O. præstans.*

O. deltoglossum (deltoid-lipped). A variety of *O. odoratum.*

O. Ehrenbergii (Ehrenberg's). A variety of *O. Rossii.*

O. epidendroides (Epidendrum-like). *fl.* large, disposed in a panicle 3ft. to 9ft. long; sepals and petals of a brilliant yellow, with three to five carmine spots, cuspidate; lip white, spotted with purple, the claw united half-way to the face of the very downy column. *l.* lanceolate. Central America.

O. facetum (elegant). A variety of *O. luteo-purpureum.*

O. gloriosum (glorious).* *fl.* mostly yellow, sometimes clouded with green, always spotted with chestnut-brown, stellate; sepals and petals oblong-ligulate, acuminate; lip cordate at base, ligulate and acuminate upwards, having a brown blotch above the crest; inflorescence long and branched. Summer. *l.* and pseudo-bulbs as in *O. crispum.* Colombia, 1865. (B. O. 12; G. C. 1865, p. 578.)

O. gracile (slender). *fl.* reddish-brown, about 1in. in diameter; lip fleshy, with two whitish crests; peduncle blackish, paniculately branched, the branches two- or three-flowered. *l.* and pseudo-bulbs tinged blackish. Ecuador. A distinct-looking species.

O. Hallii. Of this species there are several fine varieties in *grandiflorum, Lairenianum, leucoglossum,* and *magnificum.*

O. Harryanum (Harry Veitch's).* *fl.*, sepals and petals brown, with transverse, greenish-yellow lines, the petals

Odontoglossum—*continued.*

projecting straight forward; lip very large, divided across the middle into two pieces, the one pure white, the other brownish-lake, with bright yellow, fringe-like crests. *l.* leathery, oblong, obtuse, 7in. to 10in. long. Pseudo-bulbs oval-oblong, compressed, 2½in. to 3in. long, two-leaved. Colombia, 1887. Evergreen. (G. C. 1887, ii., p. 169; W. O. A. viii., t. 366.) There are several varieties, including *flavescens,* with flowers wholly yellow.

O. Hennisii (Hennis'). *fl.*, sepals and petals yellow, with brown spots; lip white and brown. Peru or Ecuador, 1891. This resembles *O. odoratum,* but is really related to *O. crinitum.*

O. Hrubyanum (Hruby's). A garden synonym of *O. cirrhosum.*

O. Hunnewellianum (Hunnewell's).* *fl.* 2in. across; sepals and petals yellow, with large, brown blotches, broadly lanceolate, acute; lip creamy-white, spotted with brown, obovate-elliptic, the edges crisped and undulated. Colombia, 1889. A small-growing species. There is a large variety of this—*maximum.*

O. ioplocon (violet-woven). This is closely allied to *O. Edwardi,* but it differs as follows: sepals longer, narrower, and more undulated; lip much smaller; and in the forms of the calli and column wings. Ecuador, 1892.

O. Jenningsianum (Jennings'). A variety of *O. crispum.*

O. Krænzlinii (Krænzlin's). *fl.* 2in. across; sepals and petals pale yellow, with brown blotches, lanceolate, acuminate; lip white, lanceolate, apiculate, with a velvety-brown blotch in front and a few purple spots at the sides. Colombia, 1893.

O. Krameri album (white). *fl.* wholly white. 1893.

O. læve auratum (golden). *fl.*, lip very narrow, a little dilated at the apex and acute at the top. 1885.

O. Leeanum (Lee's).* According to the Kew authorities this is a variety of *O. odoratum,* but by others it is regarded as distinct.

O. ligulare (strap-like). A variety of *O. Lindleyanum.*

O. limbatum (bordered). A variety of *O. crispum.*

O. Lindleyanum albidulum (whitish). *fl.* yellowish-white, with some light sulphur at the base of the lip. 1885.

O. Lucianianum (Lucien Linden's).* *fl.* white, blotched with reddish-purple, racemose; sepals and petals lanceolate, acuminate; lip velvety, the epichil oblong-ligulate, cuspidate, with crenulate margins; wings of the column linear-aristate, very narrow. Pseudo-bulbs pyriform, attenuated, smooth. Venezuela, 1887. (I. H. ser. v., t. 7; L. ii., t. 65.)

O. luteo-purpureum Amesianum (Ames'). *fl.* of a pale yellowish-green. 1891.

O. l.-p. Vuylstekeanum (Vuylsteke's).* *fl.* sulphur, with a few blotches of the deepest and richest orange on the odd sepal, the petals, and the lip (which is much dilated at the top); lateral sepals orange, except at their base. Colombia. A grand variety. The form *maculatum* has the disk of petals and base of lip whitish-sulphur, the other parts deep yellow, a few conspicuous, cinnamon blotches being scattered over sepals, petals, and lip. 1884.

O. maculatum. Of this species two other varieties worth mention are: *anceps* and *superbum.*

O. miniatum (scarlet), of gardens. A variety of *O. coronarium.*

O. mirandum (extraordinary). A variety of *O. Lindleyanum.*

O. odoratum baphicanthum. The form *immaculatum* has primrose-yellow flowers without any spots. 1893.

O. o. Ortgiesianum (Ortgies'). *fl.*, sepals and petals white, edged with yellow, and with a central maroon spot. Colombia. (R. G., t. 1360.)

O. oliganthum (few-flowered) *fl.* two or three to a peduncle; sepals and petals brown, with a reddish area which on the base of the petals is spotted with brown; lip rich yellow, with a brown border to the basal part and some brown spots on the front lobe. *l.* linear-ligulate, acute, 8in. long. Pseudo-bulbs fusiform. Guatemala, 1879.

O. orientale (Eastern). *fl.* yellow, large, having dark spots on the petals, upper sepal, and lip; inflorescence 2ft. to 3ft. long. Eastern Andes of Ecuador, 1879. This species is much in the way of *O. pardinum.*

O. ornatum (ornamental). *fl.* creamy-white in the centre, and marked with small, red spots. Colombia, 1891.

O. Ortgiesianum (Ortgies'). A form of *O. odoratum.*

O. Pescatorei Germinyanum (Comte de Germiny's). *fl.* white, flushed rosy-purple on the sepals, and marked with a few rose-purple spots, chiefly on the mid-line of the sepals, and one at the apex of the petals; basal part of the lip broadly margined purple round a yellow disk, which has some radiating, purple lines and a figured blotch in front, the front lobe spotted purple. (W. O. A. vii., t. 305.)

O. P. leucoxanthum (white-and-yellow).* *fl.* of a pure white, except some orange on the crests of the lip, the wings, and the base of the column. 1887. A remarkable form. (G. C. 1887, i., p. 606.)

Odontoglossum—*continued.*

FIG. 595. ODONTOGLOSSUM PESCATOREI VEITCHII.

O. P. Veitchii (Veitch's).* *fl.* larger and more symmetrical than in the commoner forms, all the segments irregularly blotched with rich magenta-purple, the portion so coloured occupying more than one-half of the entire surface; inflorescence panicled. This is a unique variety. It flowered originally in Messrs. J. Veitch's Nursery, at Chelsea, among a batch of imported plants. It is now in the collection of Baron Schroder, where, under skilful cultivation, it has made considerable improvement. See Fig. 595.

O. platychilum (broad-lipped). *fl.* 2in. across, one or two on a short scape; sepals and petals creamy-white, with chestnut markings at base; lip large, cordate, of a soft pink, with purple spots. *l.* semi-erect, oblong-lanceolate, about 9in. long. Pseudo-bulbs ovate, one-leaved. Central America (?), 1892. (G. C. 1892, xi., p. 587, f. 84; J. H. 1892, xxiv., p. 329, f. 56.)

O. pretiosum. A synonym of *O. Schlieperianum.*

O. p. grandiflorum (large-flowered). A fine variety having larger flowers than the type.

O. prionopetalum (serrate-petaled).* *fl.* 4in. across; sepals and petals rich yellow, heavily spotted and barred chestnut-brown, the petals deeply serrate; lip white in front, pale yellow behind, with a large, transverse, brown blotch in the centre. Spring. Colombia. A handsome plant, allied to *O. luteo-purpureum.* (R. ii., t. 84; W. O. A. x., t. 474.)

O. pulchellum Dormannianum (Dormann's). *fl.* white, 1¼in. to 1⅔in. in diameter; sepals and petals ⅓in. broad. Pseudo-bulbs stronger, stouter, and rounder than in the type. Guatemala.

O. ramosissimum cœleste (celestial). *fl.* tinted with mauve instead of spotted, as in the type. 1893. (I. H. 1893, t. 170.)

O. ramulosum (slightly branched). *fl.* yellow, small, with a deep brown stain at the base of the sepals and petals; lip with a brown stain on each side of the principal lamellæ; column purple-brown; panicle long and narrow. Colombia, 1855.

O. retusum (retuse). *fl.*, sepals and petals orange-red, tinged yellow, lanceolate, acute; lip yellow, or the same colour as the sepals and petals, oblong, retuse, bilamellate at base; panicle branched, 100- to 150-flowered. *l.* linear-lanceolate, papery. Ecuador, 1846. A dwarf, small-flowered species.

O. rhynchanthum (beak-flowered). *fl.*, sepals and petals yellow, ligulate, acute, with a brown line and a few brown spots at the base of the petals; lip with a narrow, acuminate front lobe, two or four keels, and no bristles; raceme lax. Colombia, 1887. This plant is something in the way of *O. Lindleyanum.*

O. rigidum (rigid). *fl.* bright canary-yellow, on long footstalks; sepals and petals oblong, acute; lip deeper in colour than the other segments, with a long claw and sub-quadrate blade that has an apiculus in the centre of the anterior margin; crest bidentate; column three-angled, green at base, yellow at apex; inflorescence tall, paniculate. *l.* linear. Pseudo-bulbs ovate. Peru.

O. roseum (rosy). A synonym of *Cochlioda rosea.*

O. Rossii albens (whitish). *fl.* spotted with yellow instead of brown. (W. O. A., t. 434.)

O. R. immaculatum (unspotted). *fl.* unspotted; sepals pale pink; petals and lip white.

O. rubescens (reddish). A variety of *O. Rossii.*

Odontoglossum—*continued.*

O. Sanderianum (Sander's). A variety of *O. constrictum.*

O. Schrœderianum.* This is now regarded as a form of *O. crispum*; but the plant described in G. C. 1887, ii., p. 364, under this name, is *Miltonia Schrœderiana.*

O. seringa (Seringa). *fl.* round, somewhat smaller than in *O. crispum*, spotted with brownish-red, and having a white centre; sepals and petals bordered with yellow. Seringa, Colombia, 1891.

O. Shuttleworthii (Shuttleworth's). This is a variety of *O. crispum.*

O. spectatissimum (most splendid). A synonym of *O. triumphans.*

O. Uro-Skinneri album (white). A variety with a pure white lip. 1893.

O. viminale (twiggy). *fl.*, sepals and petals brown, with whitish-sulphur borders, and linear spots around the margin, which are scarcely visible; lip light sulphur at base, deep yellow in front, with an angle at each side of the base and the lanceolate anterior part; column pale green, bordered mauve at top. *l.* linear, acute, more than 1ft. long. Pseudo-bulbs the size of a large hen's-egg. Colombia, 1885.

O. Vuylstekeanum (Vuylsteke's). A variety of *O. luteo-purpureum.*

O. Warnerianum (Warner's). A variety of *O. Rossii.*

O. Warscewiczii (Warscewicz'). A synonym of *Miltonia Endresii.*

The following among a number of other species are in cultivation in botanical collections: *O. auriculatum, O. guttatum, O. longifolium, O. myanthum.*

Hybrids.

NAME.	PARENTAGE AND RAISER.
crispo-Harryanum	*crispum* and *Harryanum* (Vuylsteke).
excellens	*triumphans* and *Pescatorei* (Veitch).
Hallio-crispum	*Hallii* and *crispum Cooksonii* (Cookson).
Harryano-crispum	*Harryanum* and *crispum* (Vuylsteke).
Leroyanum	*crispum* and *luteo-purpureum* (Leroy).
loochristyense	*crispum* and *triumphans* (Vuylsteke).
Rolfœ	*Harryanum* and *Pescatorei* (Vuylsteke).
Souvenir de Victor de Crom	*luteo-purpureum* and *Harryanum* (Hye).
Wattianum	*Lindleyanum* and *Harryanum* (Crawshay).

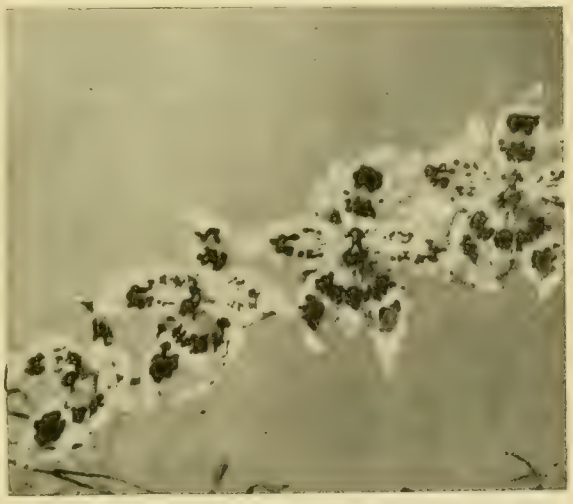


FIG. 596. ODONTOGLOSSUM ANDERSONIANUM.

Natural Hybrids.

NAME.	PARENTAGE.
acuminatissimum	*Lindleyanum* and *luteo-purpureum.*
Adrianæ	*Hunnewellianum* and *crispum.*
Andersonianum (see Fig. 596)	*crispum* and *gloriosum.*
aspersum	*maculatum* and *Rossii.*
cirrho-cristatum	*cirrhosum* and *cristatum.*
Cookeanum	*gloriosum* and *triumphans.*
Coradinei	*Lindleyanum* and *crispum.*
Denisoniæ†	*luteo-purpureum* and *crispum.*

† The original name of this cross.

Odontoglossum—*continued.*

NAME.	PARENTAGE.
dicranophorum	*Lindleyanum* and *triumphans.*
elegans	*cirrhosum* and *Hallii.*
elegantius.....	*Lindleyanum* and *nobile* (*Pescatorei*).

FIG. 597. ODONTOGLOSSUM EXCELLENS.

excellens (see Fig. 597)	*Pescatorei* and *triumphans.*
Galleottianum	*Cervantesii* and *nebulosum.*
Hallio-Kegeljani	*Hallii* and *Kegeljani* (*polyxanthum*).
Hinnus.....	*cirrhosum* and *cristatum.*
Horsmanii	*luteo-purpureum* and *nobile.*
Humeanum.....	*cordatum* and *Rossii.*
lanceus.....	Syn. *Andersonianum.*
Mulus	*gloriosum* and *luteo-purpureum.*
Murrellianum	*nobile* and *gloriosum.*
Ruckerianum	Syn. *Andersonianum.*
Staurastrum	*Lindleyanum* and *tripudians.*
Stauroides	*Lindleyanum* and *nobile.*
Wattianum...	*Lindleyanum* and *Harryanum.*
Wendlandianum	*crinitum* and *crispum Lehmannii.*
Wilckeanum	*luteo-purpureum* and *crispum.*
Williamsianum.....	*grande* and *Schlieperianum.*

ODONTONEMA. A synonym of **Thyrsacanthus** (which *see*).

ODONTOSPERMUM. To the species described on p. 476, Vol. II., the following should be added:

O. maritimum (sea-loving). *fl.-heads*, involucral bracts spathulate. *l.* oblong-spathulate, villous. Branches sometimes leafy, sometimes naked, one-headed. Stems irregularly branched. Mediterranean region. (G. C. 1884, xxii., p. 392, f. 70.) SYN. *Asteriscus maritimus.*

ŒNECTRA PILLERIANA. *See* **Vine Moths.**

ŒNOCARPUS. To the species described on p. 476, Vol. II., the following should be added:

Œ. dealbatus (whitened). *fl.*, spadices three or solitary, slender, pendulous, 1½ft. to 2ft. long, much-branched. *fr.* globose or ovoid. *l.* about twenty in a head; segments very numerous (fifty to seventy), linear-lanceolate, acuminate, 2ft. to 2½ft. long. Stem tall, soboliferous. Brazil. The correct name of this species is *Mauritia armata.*

ŒNOPLEA. A synonym of **Berchemia** (which *see*).

ŒNOTHERA. Including *Pachylophus.* To the species and varieties described on pp. 476-9, Vol. II., the following should be added:

Œ. acaulis. This is now regarded as identical with *O. taraxacifolia.*

Œ. crassicaulis (thick-stemmed).* *fl.* white, tinted with yellow in the centre, 3in. to 4in. in diameter; style four-lobed. July to September. *l.* lanceolate, acute, unequally toothed, with whitish nerves. Stems branched from the base, the branches ascending. *h.* 1½ft. to 2ft. North America. A fine biennial.

Œ. Drummondii (Drummond's). *fl.* pale yellow, with a greenish centre; petals obcordate, 1½in. long. June to October. *l.* ovate-lanceolate, undulated; cauline ones sessile. *h.* 2ft.

Œnothera—*continued.*

Texas, 1833. Annual or biennial. (B. M. 3361.) There is a dwarf form *nana*, with large flowers.

Œ. eximia is a synonym of *Œ. cæspitosa.*

Œ. formosa (beautiful). *fl.* pure white, about 3½in. in diameter. Habitat not recorded, 1899. A dwarf plant.

Œ. Fraseri (Fraser's). A variety of *Œ. glauca.*

Œ. fruticosa major (greater).* This is a very free-flowering variety having golden-yellow flowers. It is later than the type.

Œ. f. Youngii (Young's).* *fl.* bright yellow. A handsome border plant of vigorous habit. There is also a double-flowered form.

Œ. grandiflora (of Willdenow). A form of *Œ. biennis.*

Œ. Johnsoni (Johnson's). This is a tall (4ft.), half-hardy annual, with large, citron-yellow flowers. North-west America, 1898. (R. G. 1898, p. 430, f. 82.)

Œ. Lamarckiana (Lamarck's). A synonym of *Œ. biennis grandiflora.*

Œ. linearis is a form of *Œ. fruticosa.*

Œ. Nuttallii (Nuttall's). *fl.* white, turning to rose-colour, small; calyx tube very slender, 1in. to 2in. long. June and July. *l.* crowded, lanceolate, pinnatifid, acuminate. North America, 1811. A stemless, pubescent perennial.

Œ. rubicunda (ruddy). A variety of *Œ. amœna.*

Œ. Sellowii (Sellow's). *fl.* bright yellow, scented, 4in. across, disposed in a long, terminal spike. June to August. *l.* ovate-lanceolate, pubescent; cauline ones lanceolate, acute. Stem erect, pubescent, simple or branched. *h.* 2ft. to 2½ft. Chili, 1831. Annual.

Œ. serotina (late), of Sweet. A synonym of *Œ. fruticosa.*

Œ. suaveolens (sweet-scented). A synonym of *Œ. biennis grandiflora.*

Œ. tanacetifolia (Tansy-leaved). A synonym of *Œ. Nuttallii.*

Œ. taraxacifolia is a form of *Œ. acaulis.*

Œ. tetraptera (four-winged). *fl.* at first whitish, then reddish, 4in. across. *l.* pinnatisect, with the divisions toothed. Stems branched from the base; branches ascending. *h.* 1ft. Mexico. Annual.

Œ. t. rosea (pink).* A variety with beautiful rose-coloured flowers. An excellent plant for either the border or the rockery.

Œ. trichocalyx (hairy-calyxed). *fl.* white, turning to pink, axillary, rather small; calyx long-hairy when young. June. *l.* crowded, pinnatifid, the young ones somewhat canescent-hairy; segments short, entire, obtuse. Stem about 1ft. high, nearly simple, erect. North America. Perennial or biennial.

Varieties. There are many new varieties of the annual section usually catalogued as Godetias. Some of the best are:

Bridesmaid. *fl.* blush-white, blotched with rose, large.

Crimson Beauty. *fl.* deep crimson, with a white centre. An excellent bedder.

Duchess of Fife. *fl.* white, blotched carmine.

General Gordon. *fl.* crimson-carmine, with lighter centre.

Gloriosa. *fl.* deep blood-red. A showy and compact variety.

Marchioness of Salisbury. *fl.* bright crimson, margined with white, large. An attractive variety.

White Pearl. *fl.* of a beautiful pure white.

ŒONIA. *See* **Æonia.**

OIL NUT. *See* **Pyrularia oleifera.**

OILY GRAIN. *See* **Sesamum indicum.**

OKRA. *See* **Hibiscus esculentus.**

OLD MAID. *See* **Vinca rosea.**

OLD MAN CACTUS. *See* **Pilocereus senilis.**

OLEA APETALA. A synonym of **Notelæa longifolia** (which *see*). *O. buxifolia* is synonymous with *O. capensis.*

OLEANDRA. Although not an extensive genus, *Oleandra* embraces some of the most interesting trailing Ferns in cultivation. *O. neriiformis*, a plant much more like an Oleander than a Fern, is, however, an exception; it grows somewhat in the way of *Gleichenia flabellata*, but has thicker and more fleshy, erect stems, which have, moreover, the peculiarity of branching out freely, and of being provided with aërial roots—a character to be found in scarcely any other cultivated Fern. All the other species make good specimens either trained upon stems of dead Tree-Ferns, which they readily ascend and quickly cover, or grown on mounds of peat. None but very fibrous peat should,

Oleandra—*continued.*

however, be used; thick turfs of it should be placed one above another, and tightly skewered together by means of wooden pegs so as to form a pyramid.

Another way of employing Oleandras is to use them for covering pillars indoors; but as they take possession of any genial surface, fastening themselves to it by means of short, fibry roots, it is indispensable that these should be provided with proper nourishment as the rhizomes extend. The best plan is to fix round the pillar a wire cylinder of 2in. to 3in. mesh, which should be filled up, as the rhizomes extend, with a mixture of two parts fibrous peat and one of sphagnum, rammed tolerably close. For hiding pillars, walls, or unsightly upright supports, the Oleandras are quite as useful as the better-known Davallias, and do not require any more special attention; although not perhaps quite such rapid growers, they possess the advantage of retaining their foliage longer than is the case with most Davallias. All the Oleandras known to cultivation require an abundance of water at their roots throughout their growing season, and they are greatly benefited by occasional syringings overhead during the summer. Although they may be propagated from spores, they are usually increased by division of the rhizomes any time between April and September.

To the species described on p. 481, Vol. II., the following should be added:

O. chinensis (Chinese). A synonym of *O. Cumingii.*

O. Cumingii (Cuming's). *sti.* forming, about 2in. from the densely brown-scaly rhizome, a sort of joint, from which the fronds, when decayed, become detached. *fronds* 1ft. to 1½ft. long, 1½in. broad, soft, gradually narrowed to both ends; midrib slightly hairy. *sori* rather large, light brown, forming a scarcely interrupted line near the midrib. Assam, &c. SYN. *O. chinensis.*

FIG. 598. OLEANDRA CUMINGII LONGIPES.

O. C. longipes (long-stalked). A variety having longer stipes than in the type. See Fig. 598.

Oleandra—*continued.*

O. C. Sibbaldii (Sibbald's). *fronds* thinner and more hairy than in the type. *sori* in very irregular lines not so near the midrib. Tahiti, &c.

O. Sibbaldii (Sibbald's). A form of *O. Cumingii.*

O. Wallichii. Although similar in habit to the other species, this is quite distinct on account of the marginal hairs along the whole length of the fronds.

OLEARIA. Daisy Bush. To the species described on pp. 481-2, Vol. II., the following should be added:

O. dentata (toothed), of Hooker. A synonym of *O. macrodonta.*

O. ilicifolia (Holly-leaved). *fl.-heads* resembling those of *O. dentata* (which this species much resembles). *l.* longer and narrower, deeply waved on the margin, with spiny teeth. Branches and twigs nearly glabrous. New Zealand. Plant Musk-scented, hardy.

O. insignis (remarkable).* *fl.-heads* white, 1in. across; florets very numerous; peduncles 6in. to 10in. long, one-headed. *l.* coriaceous, oblong, obtuse, quite entire, 4in. to 6in. long. Stems densely clothed with white or reddish felt. New Zealand. A low, flat-topped, robust, greenhouse bush. (B. M. 7034.)

O. macrodonta (large-toothed). *fl.-heads* white, with a red centre, small, Daisy-like, disposed in large, hemispherical corymbs. *l.* elliptic-oblong, undulated, coarsely toothed, somewhat Holly-like in appearance. New Zealand, 1886. Hardy shrub or tree. (B. M. 7065; G. C. n. s., xxvi., pp. 304-5.) SYN. *O. dentata* (of Hooker).

O. myrsinoides (Myrsine-like). *fl.-heads* pale purple, narrow, three to five together on axillary peduncles forming a leafy, oblong panicle. May. *l.* alternate, obovate to oblong, less than ¼in. long. Australia, 1835. A silvery or silvery-tomentose, greenhouse shrub, low and straggling or densely bushy.

O. nitida (shining). *fl.-heads* white, with yellowish disk, in close, many-flowered, rounded corymbs; florets fifteen to twenty. *l.* resembling those of *O. furfuracea*, but more ovate, less coriaceous, sinuate-toothed, acute or acuminate, the tomentum more silvery and shining. New Zealand, 1886. A small, hardy tree. (G. C. n. s., xxvi., pp. 44-5, f. 10.)

O. nummularifolia (Moneywort-leaved). *fl.-heads* white, solitary, on peduncles longer or shorter than the leaves. *l.* closely-set, erect, spreading, or deflexed, ¼in. to ½in. long, orbicular, oblong, obovate, obtuse, quite entire. Branches stout, erect, often glutinous. *h.* 1ft. to 10ft. New Zealand (at 4000ft.), 1899. Hardy.

O. stellulata (slightly stellate). The correct name of *O. Gunniana.*

O. Traversii (Travers'). *fl.-heads* ¼in. long, very numerous, on slender pedicels; panicles numerous, cymose, axillary and terminal, much-branched. *l.* flat, opposite, oblong- or ovate-lanceolate, acuminate, quite entire, 1½in. to 2½in. long, glabrous and shining above, silky-downy beneath (as well as the panicles and branches). *h.* 30ft. to 35ft. New Zealand, 1887. (G. C. 1887, ii., p. 187.) Only hardy in very favoured localities.

OLEOBACHIA PALUSTRIS. A corruption of *Delabechea palustris. Delabechea* is now included under **Sterculia** (which *see*).

OLYRA (the name of a kind of grain mentioned by Herodotus and others as food for horses, along with Barley). ORD. *Gramineæ.* A genus embracing about twenty species of tropical Grasses, all, except one or two African, being American; they are remarkable for the great variety they display in habit, foliage, inflorescence, and sexuality of the spikes. Only one species calls for mention here. It forms a very elegant, evergreen pot plant for the stove, thriving in any fairly good soil, and may be increased by seeds or by divisions.

O. concinna (neat).* *fl.*, spikes rather shorter than the leaves, terminal and axillary; spikelets three, two female and one male. January. *l.* 1in. long, uniform, distichous, sessile in very short sheaths, almost imbricated, ovate, cuspidate-acuminate, often reddish towards the tips. Stems 6in. to 10in. long, filiform, at length drooping. Costa Rica, 1891. (B. M. 7469.)

OMPHALODES. Though usually regarded as healthy, *O. Luciliæ* and *O. verna* are better for protection in winter. To the species described on pp. 482-3, Vol. II., the following should be added. *See also* **Paracaryum.**

O. Krameri (Kramer's).* *fl.* of a rich blue, about as large as a sixpence. *l.* ample. Japan, 1882. A beautiful addition to our hardy plants; it is larger in growth than either *O. Luciliæ* or *O. verna.*

O. verna alba (white). This only differs from the type in having white flowers.

ONCIDIUM. Cyrtochilum and **Palumbina** (which *see*) are now included hereunder. To the species and varieties described on pp. 483-91, Vol. II., the following should be added. Those marked T. are tropical, while those marked C. will thrive in a cool-house. The remainder require an intermediate temperature.

O. æmulum. This is regarded as identical with *O. superbiens.*

O. albo-verrucosum (white-warted). *fl.* bright yellow, having the sepals barred with brown and the warted crest white. 1898. A supposed new species. [C.]

O. anomalum (anomalous). A synonym of *O. panchrysum.*

O. anthocrene (flower-fountain). *fl.* disposed in large, upright, branched spikes; sepals and petals chocolate-brown, transversely barred yellow towards the base, much undulated; lip white. Summer. Peru. A curious species, in habit somewhat resembling *Miltonia Warscewiczii.* (W. O. A. ix.,-t. 392.) [T.]

O. aureum (golden). *fl.* 1¼in. across; sepals and petals pale greenish-yellow, with a faint purplish tinge near the base; lip bright golden-yellow; racemes five- to seven-flowered; scapes 1¼ft. to 1⅔ft. long. *l.* linear-lanceolate, 4in. to 5in. long. Pseudo-bulbs 1in. to 1½in. long, one- or two-leaved. Mexico, 1833. [C.]

O. auriferum (gold-bearing). *fl.* 1in. across; sepals and petals citron-yellow, with two or three pale brown bars; lip citron-yellow, with a pale red blotch near the crest, three-lobed; peduncles longer than the leaves, loosely panicled. *l.* linear, 7in. to 10in. long. Venezuela, 1846-7. Allied to *O. panchrysum.* [C.]

O. aurosum (golden). A variety of *O. excavatum.*

O. bicolor (two-coloured). The Kew authorities regard this as a distinct species, and not as a variety of *O. Martianum.*

O. bracteatum (bracteate). *fl.* 1in. across; sepals and petals bright yellowish-green, spotted with blackish-purple; lip broadly clawed, the claw reddish-brown, the blade and auricles light yellow, white beneath; scapes 3ft. to 4ft. long, with a spathe-like bract at each node. *l.* linear-ligulate. Pseudo-bulbs much compressed, two-leaved. Colombia, 1849-50.

O. brevilabrum (short-lipped). *fl.* bright yellow, barred with brown, ⅔in. in diameter, disposed in many-flowered panicles. *l.* linear, 1ft. long. Pseudo-bulbs ovoid, 2in. long. 1894. [C.]

O. Brienianum (O'Brien's).* *fl.* of a bright sulphur-yellow, distinctly barred with cinnamon, having a very small front blade to the lip; pedicels very short; raceme nodding. Pseudo-bulbs short, small, compact. Paraguay, 1881. [C.] In the variety *rufida* the flowers are nearly covered with cinnamon.

O. cæsium (greyish). A synonym of *O. Geertianum.*

O. caminiphorum (furnace-bearing). *fl.* brightly coloured, 1in. across; sepals and petals brown in the basal half, yellow in the upper; lip yellow, with red spots and a chestnut band; peduncles panicled, many-flowered. *l.* linear-oblong, 3in. to 5in. long. Pseudo-bulbs much compressed, 1½in. long, one-leaved. Caracas, 1850. The specific name is a fanciful one.

O. candidum (white). The correct name of *Palumbina candida.*

O. chrysodipterum (golden-winged).* *fl.* 3in. across; dorsal sepal chestnut, with a narrow yellow border, the lateral ones wholly brown, divergent; petals bright gamboge-yellow, spotted with brown on the basal half; lip yellow, stained with brown, linear, deflexed; scape 3ft. to 9ft. or more in length, branched. *l.* broadly ligulate, 15in. to 20in. long. Pseudo-bulbs 3in. long, one- or two-leaved. Probably Andean, about 1890. A very handsome species.

O. chrysomorphum (dark-golden). *fl.* numerous, crowded, ⅔in. across; sepals and petals golden-yellow, similar; lip paler, oblong, dilated at base and apex into two rounded lobes; scapes 1½ft. to 1⅔ft. long, panicled from the middle. Winter. *l.* linear, 7in. to 9in. long. Pseudo-bulbs 1½in. long, compressed, two- or three-leaved. Colombia, 1877.

O. chrysops (golden-eyed). *fl.*, sepals light brown, cuneate-oblong; petals light brown, much broader, somewhat wavy, blunt; lip bright yellow, the basilar laciniæ small, the isthmus very short, the large anterior blade reniform, emarginate, the calli triseriate; peduncle reddish, racemose. *l.* reddish, short. 1888. Allied to *O. bicallosum.*

O. chrysopyramis (golden-pyramid). *fl.* of a uniform canary-yellow, ⅔in. across; upper sepal and petals clawed; lip panduriform; peduncles slender, 1½ft. to 2ft. long, loosely paniculate, many-flowered. June. *l.* linear-ligulate, 5in. to 6in. long. Pseudo-bulbs 1½in. to 2½in. long, with acute edges, two-leaved. Andes of Ecuador or Southern Colombia, 1852.

O. chrysorhapis (golden-needled). *fl.*, sepals and petals light sulphur-yellow, the disk spotted dark brown, forming one mass, with extended external processes on the upper sepal and petals; side laciniæ of the lip linear, lobed at top, erect, the claws covered with tumours, the anterior blade reniform, emarginate, very large; pedicels three- to five-flowered. *l.* cuneate-oblong-lanceolate, acute, 6in. to 7in. long, 1½in. wide. Brazil, 1883. [T.]

Oncidium—*continued.*

O. chrysornis is a form of *O. ochthodes.*

O. crispum ochraceum (ochreous). *fl.* ochre-brown, without lateral crests on the sides of the middle keel of the lip. 1888.

O. cristatum (crested). *fl.* bright yellow, 1½in. across, with a few red spots on the crest of the lip; panicle branched, arching, many-flowered. *l.* linear-lanceolate, 6in. to 9in. long. Pseudo-bulbs ovate, 2in. long. Brazil, 1892. (L. x., t. 451.)

O. crocodiliceps (crocodile's-head). *fl.* several in a one-sided raceme; sepals and petals greenish-sulphur, striped and blotched cinnamon, the sepals ligulate, acute, the petals sub-equal; lip white, with a tuft of yellow hairs at the sub-cordate or rounded base, and a velvet callus in front; anther very large, comparable to a broad crocodile's head. *l.* cuneate-oblong, acute, very strong. Pseudo-bulbs ultimately much wrinkled Mexico, 1885. [C.]

O. Cræsus is a variety of *O. longipes.*

O. cruentum (bloody). A synonym of *O. reflexum pelicanum.*

O. cucullatum. According to the Kew authorities, the correct name is *O. oliraceum.*

O. decipiens is a form of *O. Crista-galli.*

FIG. 599. INFLORESCENCE OF ONCIDIUM FORBESII.

O. detortum (crooked). *fl.*, sepals light brown, shortly clawed and eared, the upper one yellowish at apex; petals yellow, with brown spots, and having shorter claws; lip with spreading-triangular side lobes and an oblong acute front one; inflorescence long. Habitat not recorded, 1888. Allied to *O. serratum.* SYN. *Cyrtochilum detortum.*

O. dichromum (two-coloured). This species is closely allied to *O. aureum*, but the flowers are larger, the sepals and petals are reddish-purple, and the lip is bright yellow; panicles branched. Peru, 1895. [C.]

O. excavatum Dawsoni (Dawson's).* *fl.* bright yellow and rich brown, large; scape 5ft. long, sometimes producing a hundred flowers. Peru.

O. falcipetalum (falcate-petaled). *fl.* 2½in. to 3in. across; sepals russet-brown, with a narrow yellow margin, clawed; petals much smaller, falcate, yellow, spotted with brown on the basal half; lip purplish-brown, linear, reflexed; peduncles flexuous, several feet long. Autumn. *l.* 1ft. or more in length. Pseudo-bulbs 2in. to 4in. long, two-leaved. Andes, before 1886.

O. fimbriatum (fringed). *fl.* ⅔in. across; sepals and petals bright yellow, barred and streaked transversely with red, the petals clawed; lip yellow, sub-panduriform, the front lobe with a minutely-fringed margin; scapes 2ft. to 3ft. long, drooping, many-flowered. June. *l.* linear or ligulate-oblong, acute. Pseudo-bulbs two-leaved. Brazil, 1878. [T.]

Oncidium—*continued.*

O. Forbesii. This is one of the finest species of the whole genus (see Fig. 599). It is often called the "Gold-laced Oncidium."

O. F. Measuresianum (Measures'). *fl.* of a pure golden-yellow, with a very narrow border of purplish-brown. 1891.

O. Gautieri is a form of *O. unicorne.*

O. Geertianum (Van Geert's). *fl.* 1½in. across; sepals and petals greenish, tinged with rose, shortly clawed; lip bright canary-yellow, three-lobed, the front lobe broadly clawed; racemes about five-flowered; peduncles slender, erect. *l.* linear, 6in. to 7in. long. Pseudo-bulbs olive, clustered, 1in. to 1½in. in diameter. Mexico, 1853. (R. G. 1854, t. 80; R. X. O. i., t. 6, f. 2, under name of *O. cæsium.*)

O. Godseffianum (Godseff's). *fl.* borne on a long, slender, branching scape. *l.* linear-lanceolate. Pseudo-bulbs 5in. long, cylindrical, two-leaved. Habitat not recorded, 1896. This species resembles *O. pubes*, but differs in its smaller flowers and in the separation of the lateral sepals.

O. gracillimum (very slender). *fl.* yellow, small, with a few pale brown marks about the bases of the segments; panicle much-branched, 3ft. long. *l.* linear-lanceolate, 8in. long. Pseudo-bulbs ovoid, 3in. long. Peru, 1898. Allied to *O. luteum* [C.]

O. hastatum hemimelænum (half-black). *fl.*, sepals and petals blackish-purple, tipped whitish-green; mid-lacinia of the lip brownish. Mexico, 1887.

O. h. Roezlii (Roezl's). *fl.* yellowish, with some brown spots, small; column, wings, and side lobes of the lip yellow, the mid-lobe of the lip brownish. 1876.

O. Henchmanni (Henchmann's). A synonym of *O. carthaginense sanguineum.*

O. heteranthum (various-flowered). *fl.* numerous, but all aborted to filiform, whitish segments except the terminal one, which is ⅔in. across; sepals and petals creamy-white, with two or three brown bars; lip somewhat lyre-shaped, the basal part reddish-brown, the apical part yellow; scape 3ft. to 4ft. long, branched almost from the base. *l.* linear, 3in. to 5in. long. Pseudo-bulbs 2in. long, two-leaved. Andes of Bolivia.

O. hians (gaping). *fl.* yellow and brown, small; lip having an extraordinary, erect, white, fleshy appendage, as long as the column, parallel with that organ, and resembling the four fingers of a hand a little hollowed out and closed together; column without cheeks; stigma beaked. *l.* oval to linear-oblong, 1in. to 2in. long. Brazil, 1838. (R. G., t. 1250A.) [T.]

O. holochrysum (wholly yellow). A synonym of *O. onustum.*

O. Hookeri (Hooker's). *fl.* lively yellow, small; sepals and petals oblong, nearly equal, the latter spotted orange; lip three-lobed, the lateral lobes linear-oblong, spreading, the middle one broadly obovate-cuneate, the base orange- or chestnut-coloured and tubercled; scape 6in. to 18in. long, paniculately branched. *l.* 5in. to 8in. long, linear-ligulate. Pseudo-bulbs clustered, two-leaved. Brazil. (B. M. 3712, under name of *O. raniferum major.*) [C.]

O. Huebschi (Huebsch's). *fl.* yellow, tinted brown, disposed in a much-branched panicle; lip narrower in front than at base, its chief mark consisting in the bipartite, orange column wings. Ecuador, 1885.

O. intermedium (intermediate). A form of *O. luridum.*

O. ionosmum (Violet-scented). A synonym of *O. tigrinum unguiculatum.*

O. iridifolium (Iris-leaved), of Lindley. A synonym of *O. Crista-galli.*

O. juncifolium (Rush-leaved). A synonym of *O. Cebolleta.*

O. Keilianum (Keil's). A synonym of *Brassia Keiliana.*

O. Kramerianum (Kramer's).* This is now regarded as a distinct species, and not as a variety of *O. Papilio.* (F. d. S., t. 1956.) SYNS. *O. nodosum, O. papilioniforme.*

O. K. resplendens (resplendent). In this form the flowers are much larger, and the colours brighter, than in *Kramerianum*; the callus of the lip, also, is longer than in that variety, and has the base and apex yellow, spotted and barred purplish-brown, the middle being white, barred purplish-mauve; the lip itself lacks the brown margin generally seen. [T.]

O. leopardinum (leopard-marked).* *fl.* yellow, showy, disposed in loose panicles about 3ft. high; sepals and petals banded dark brown; lip banded brown at base, the middle lobe unguiculate, transversely emarginate, the base auriculate. Peru. A free-flowering, compact species. [T.]

O. Leopoldiana (Leopold II.'s). *fl.* 1⅔in. across; sepals and petals white, with a purple disk, the former shortly unguiculate; lip violet-purple, fleshy, slightly three-lobed; bracts ⅔in. long; panicle very long, branching, many-flowered. Andes, 1890. (L. vi., t. 274.) [T.]

O. lepturum (slender-tailed). *fl.*, properly formed ones light yellow, spotted brown; sepals and petals cuneate-oblong, acute; lip with a very broad, cordate base, narrowed into a small, bifid apex, and having a cushion of finger-like calli at the base. Bolivia, 1886. One of the group with tufts of abortive flowers. [C.]

Oncidium—*continued.*

O. leucotis (white-eared). This species is closely allied to *O. obryzatum*, but has a stiffer panicle of wholly yellow flowers. Colombia, 1880.

O. Lietzei (Lietze's). *fl.* bright reddish-brown, sometimes spotted with yellow (var. *aureo-maculatum*, R. G. 1887, t. 1279), numerous, not fully expanding; lateral sepals connate into a narrow blade; lip having two reflexed auricles; scapes slender, 2½ft. to 3ft. long. Spring. *l.* oblong-lanceolate, 6in. to 8in. long. Pseudo-bulbs 2in. to 5in. long, clothed for half their length with whitish sheaths. Brazil, 1881. (R. G. 1881, t. 1044). In the variety *bicolor* the flowers are variegated with yellow.

O. longifolium is a synonym of *O. Cebolleta*, and not a variety of *O. Cavendishianum.*

FIG. 600. ONCIDIUM LONGIPES CRŒSUS.

O. longipes Crœsus (Crœsus). The correct name of *O. Crœsus.* See Fig. 600.

O. loxense (Loxa).* *fl.* in a broad panicle; sepals dull olive, barred cinnamon, unguiculate, oblong, acute; petals broader and shorter; lip bright orange, having a tooth-like auricle on each side of the base, a short, broad stalk, and a broad, reniform blade. *l.* cuneate-ligulate, acuminate. Pseudo-bulbs oblong, furrowed, two-leaved. Cordillera of Loxa, 1884. (R. ser. ii., t. 54; W. O. A. x., t. 439.) [C.]

O. Lucasianum (Lucas's). *fl.* golden-yellow, resembling those of *O. Marshallianum*, disposed in loose, erect racemes. Pseudo-bulbs ovate, 2in. long, two-leaved. Habitat not recorded, 1894. (G. C. 1894, xv., pp. 475, 479, f. 51.)

O. ludens (playful). *fl.*, sepals rich brown, unguiculate, the upper one transversely elliptic, the lateral ones oblong, acute; petals yellow, marbled cinnamon, shortly unguiculate, hastate, annular, occurring both closed and open; lip pale yellowish-ochre and brown, recurved towards the apex; column greenish, striped brown, the wings dark purple. Habitat not recorded, 1885. Allied to *O. annulare.* [T.]

O. luridum intermedium (intermediate). *fl.* bright yellow, large, with numerous circular, reddish-brown spots. (W. O. A. viii., t. 345, under name of *O. intermedium.*)

O. lutescens (yellowish). *fl.*, dorsal sepal dark brown, with a yellow, recurved margin, long, wavy, the lateral ones greenish-brown; petals dark brown, edged with yellow, very short, wavy, auricled; lip dark greenish at the angled base, purple in front, oblong, short, with a three-toothed crest. Habitat not recorded, 1887. Allied to *O. metallicum.*

O. luteum (yellow). *fl.* pale yellow, small, numerous, disposed in a panicle 1½ft. long. *l.* 4in. long. Pseudo-bulbs ovate, over 1in. long. Habitat not recorded, 1893. Allied to *O. chrysopaedinis.*

O. macranthum Williamsianum (Williams'). *fl.* having a large, Indian purple blotch on each petal. Colombia.

O. micranthum (small-flowered). A synonym of *Cyrtochilum micranthum.*

Oncidium—*continued.*

O. microchilum (small-lipped). *fl.* 1¼in. across; sepals pale brown, with yellow markings; petals chestnut-brown or brownish-purple, barred and margined with yellow; lip white, purple-spotted, three-lobed, small; scapes robust, very glaucous, 3ft. to 4ft. long, the branches few-flowered. *l.* rigid, oblong, 7in. to 12in. long. Pseudo-bulbs 1½in. to 2in. long, one-leaved. Guatemala, 1838. (B. R. 1843, t. 23; Ref. B. ii., t. 122.)

O. Micropogon (small beard). *fl.* 1¼in. across the petals; sepals yellow, banded pale brown, linear-oblong, acuminate, undulated; petals golden-yellow, with a deep reddish-brown claw, much broader than the sepals; lip golden-yellow, with three sub-equal, spreading, clawed lobes, the disk covered with yellow and brown tubercles; racemе 8in. to 10in. long, pendulous. August. *l.* two to a pseudo-bulb, 4in. to 6in. long, linear-oblong. South Brazil (?), 1886. (B. M. 6971; R. G. 1855, t. 136; R. X. O. i., t. 63, f. 2.)

O. monachicum (monkish). *fl.*, dorsal sepal dark brown, with a crisped, yellow border, reniform, overarching, the lateral ones large, cuneate-oblong, on long stalks; petals cinnamon, blotched and edged sulphur-yellow, roundish-hastate, incurved, undulated; lip brown, ligulate, with an angular base and a double callus; spikes large and branching, as in *O. serratum*. March and April. Colombia. Allied to *O. metallicum*. (G. C. 1883, xix., p. 369, f. 54.) [T.]

O. murinum (wine-like). *fl.* yellow, with the column of a dull crimson-purple, small, but pretty and numerous, in a large panicle; lip triangular, sessile, fleshy, with two roundish crests on the disk. Ecuador, 1888.

O. nanum (dwarf). *fl.* ⅜in. across; sepals and petals yellow, spotted with brown, incurved; lip bright yellow, with two small auricles at base; scapes decumbent, panicled, the branches short and few-flowered. *l.* from a creeping rhizome, 3in. to 6in. long, pea-green, spotted with red. Pseudo-bulbs wanting. British Guiana, 1842.

O. nodosum (noded). A synonym of *O. Kramerianum*.

O. nubigenum (cloud-born). A variety of *O. cucullatum*.

O. olivaceum (Olive-like). The correct name of *O. cucullatum*.

O. ornithopodum (bird-footed). *fl.* having a singular, trifid callus, with a solid, beak-like median tooth and excavated lateral angles. Tropical America, 1879.

O. orthotis (straight-eared). *fl.* yellow, ⅜in. across, with brown markings, terminal on each branch, with one or two aborted ones; upper sepal reflexed, the lateral ones hanging straight down; petals widely spreading; lip broadly cordate. *l.* solitary, 1½in. to 2in. long. Pseudo-bulbs small. Habitat not recorded, 1888. (I. H. 1888, t. 69.)

O. panchrysum (all golden). *fl.* of a uniform bright canary-yellow, 1¼in. across; sepals acute, the lateral ones divergent; petals obtuse; lip somewhat panduriform; scapes erect, 1½ft. to 2ft. long, panicled and many-flowered. *l.* ligulate, 9in. to 12in. long. Pseudo-bulbs much compressed, 2½in. long, one-leaved. Colombia, 1842. [C.] SYN. *O. anomalum*.

O. panduratum (fiddle-shaped). *fl.* reddish-brown and yellow, smaller and more numerous than in *O. anthocrene* (which this species otherwise resembles). Colombia, 1895.

O. Papilio Kramerianum is now accorded specific rank.

O. P. majus (greater). A synonym of *O. P. Eckhardti*.

O. papilioniforme (butterfly-like). A synonym of *O. Kramerianum*.

O. pardoglossum (panther-marked-lipped). *fl.* chestnut-coloured, narrow, much marked with yellow on the lip, and having a very obscure, yellow band on the dorsal sepal; column light yellow, very long, with brownish-purple wings. 1886. An interesting species.

O. pelicanum (pelican-beaked). A form of *O. reflexum*.

O. prætextum Gravesianum (Graves'). *fl.* yellow and brown, 2in. in diameter, disposed in branched panicles. South Brazil, 1892. (G. C 1892, xi., pp. 535, 650, f. 94.)

O. pyramidale (pyramidal). *fl.* bright canary-yellow, 1in. across, with red spots and markings; sepals and petals reflexed; lip somewhat panduriform, with the front lobe emarginate; peduncles erect or nodding, 1½ft. or more in length, many-flowered. *l.* linear-ligulate, 5in. to 8in. long. Pseudo-bulbs 1in. to 2in. long, two-leaved. Southern Colombia, 1842. A rare species.

O. raniferum (frog-bearing). *fl.* bright yellow, small but showy; sepals and petals reflexed; lip three-lobed, the large crest orange-red; scapes 5in. to 8in. long; sparingly branched, many-flowered. *l.* Grass-like, 5in. to 8in. long. Pseudo-bulbs clustered, 1in. to 2in. long, tapering, two-leaved. Brazil, 1837. The crest "somewhat resembles the figure of a frog *couchant*" (Veitch).

O. r. major (larger). A synonym of *O. Hookeri*.

O. refractum (bent back). *fl.* greenish-yellow, barred with brown; sepals and petals wavy, pointed; column and lip reflexed. Colombia, 1894. Allied to *O. zebrinum*.

O. Rigbyanum (Rigby's). A synonym of *O. sarcodes*.

Oncidium—*continued.*

O. robustissimum (very robust). *fl.* larger than in *O. sphegiferum* (to which this species is allied); sepals and petals brown at base, yellow at apex; lip yellow, with brown stripes, the side lobes rounded and serrated; branches of the panicle straight. Brazil, 1888.

O. Rogersii (Rogers'). A variety of *O. varicosum*.

O. Rolfeanum (Rolfe's). *fl.* yellow and brown, disposed in a long, branching raceme. Colombia, 1892. One of the small-lipped section, and allied to *O. Kienastianum*.

O. roseum (rosy). A synonym of *O. carthaginense sanguineum*.

O. Saintlegerianum (Saint Leger's). A synonym of *O. spilopterum*.

O. Sanderianum (Sander's). This is described by one authority as "free-flowering, with thickly-branched scapes of large, rosy-red blossoms," but the flowers have also been described as chocolate-brown. Peru, 1893. This species is said to be allied to *O. serratum*.

O. sanguineum (bloody). A variety of *O. carthaginense*.

O. sphegiferum (wasp-bearing). *fl.* bright orange, 1in. across, with a reddish stain at the base of each segment; sepals and petals clawed; lip sub-pandurate, the front lobe of a lighter orange than the sepals and petals; scapes 3ft. to 4ft. long, panicled, many-flowered. *l.* elliptic-oblong, 6in. to 8in. long. Pseudo-bulbs 1in. to 1½in. in diameter, one-leaved. Brazil, 1842-3. (P. F. G. ii., No. 124.) [T.]

O. spilopterum is now regarded as a distinct species, and not as a variety of *O. Batemannianum*. SYN. *O. Saintlegerianum*.

O. Sprucei (Spruce's). *fl.* bright yellow, produced in great profusion; sepals and petals blotched red above, obovate, obtuse; lip having the transverse middle lobe narrowly clawed, two-lobed, stained red at base; panicles flexuous. *l.* sometimes 2½ft. long. Brazil. Allied to *O. Cebolleta*. [T.]

O. stelligerum (star-bearing). *fl.* stellate, paniculate; sepals and petals yellowish, with many brown spots, oblong-ligulate; lip yellowish-white, with a darker yellow callus, the lateral lobes short, obtuse-angled, the isthmus narrow, the middle lobe roundish-cordate, shortly and abruptly cuspidate. Mexico. Allied to *O. hastatum*. [C.]

O. s. Ernesti (Ernest's). *fl.* pale yellow, with large, rounded, brown spots on the sepals and petals, and a reddish-purple front lobe to the lip. Mexico, 1887. (W. O. A. vi., t. 260.) [C.]

O. suave (pleasant). *fl.* fragrant, more than 1in. across; sepals and petals dark sepia-brown, obscurely keeled, reflexed at tip; lip bright yellow, blotched with reddish-brown around the crest, three-lobed; peduncles slender, 1½ft. to 1¾ft. long, paniculate, the branches few-flowered. *l.* linear, 6in. or more in length. Pseudo-bulbs ancipitous, 3in. long. Oaxaca, 1835. (P. F. G. ii., f. 135.)

O. superbiens (superb).* *fl.* 2½in. in diameter; sepals chocolate-brown, tipped yellow, long-clawed, the upper one much crisped, reflexed at apex, the lateral ones more ovate and less curved; petals smaller, yellow above, barred chocolate below, cordate-oblong, recurved, with a shorter and broader claw; lip blackish-purple, with a yellow crest, very small, revolute; panicle loose, flexuous, twenty- to thirty-flowered; scape (and inflorescence) 2ft. to 3ft. long. *l.* about 1ft. long, linear-oblong, acute, keeled. Pseudo-bulbs elongate-ovate, compressed, about 4in. long. Colombia, Venezuela. (B. M. 5980.) [T.] SYN. *O. æmulum*.

O. teretifolium albens (whitish). *fl.* pale yellowish-white. 1877.

O. tetrapetalum (four-petaled). *fl.* 1in. across; sepals and petals bright chestnut-red, barred and marked with yellow, clawed, the lateral sepals connate and concealed by the lip; lip white, with a red blotch in front of the crest, broadly clawed; scapes erect, 1½in. to 2in. long, many-flowered. *l.* in tufts of four or more, 3in. to 6in. long, fleshy, triquetrous. Pseudo-bulbs wanting. West Indies. SYN. *O. tricolor* (B. M. 4130).

O. tigrinum splendidum (splendid). A synonym of *O. splendidum*.

O. tricolor (three-coloured). A synonym of *O. tetrapetalum*.

O. unicolor (one-coloured). *fl.* of a uniform yellow. Brazil, 1893. This species is allied to *O. uniflorum*, but is of more robust habit.

O. urophyllum (tail-leaved). *fl.* 1in. across; sepals and petals clear yellow, blotched with chestnut-brown, the lateral sepals connate almost to the apex; lip canary-yellow, three-lobed; scapes drooping, 1½ft. to 2ft. long, many-flowered. *l.* ensiform, curved, 4in. to 6in. long. Pseudo-bulbs wanting. Antigua, 1838 and 1891. (B. R. 1842, t. 54.)

O. ustulatum (burnt). *fl.* brown, with a light border to the sepals, some yellowish lines on the borders of the petals, and the front lobe of the lip reddish-purple; sepals and petals crisped; callus very broad, with spreading, linear-ligulate lamellæ, lined and dotted with brown. Colombia, 1883. Much in the way of *O. metallicum*.

O. viperinum (viper-like). *fl.* 1in. across; sepals and petals pale reddish-brown, barred with light yellow, much undulated,

Oncidium—*continued.*

the lateral sepals free; lip canary-yellow, with a curious crest (resembling vipers' heads seen in profile); peduncles erect, 5in. to 7in. long, few-flowered; axis of the inflorescence twining. *l.* linear-oblong, 2in. long. Pseudo-bulbs obscurely four-angled, 1in. long, two-leaved. Uruguay. [T.]

O. volvox (twining). *fl.* 1in. across; sepals and petals yellow, much spotted with reddish-brown for two-thirds of their length; lip bright yellow, sub-panduriform; scapes very slender, flexuous, 3ft. to 5ft. long, the branches two- or three-flowered. Autumn. *l.* narrow-ligulate, 8in. to 12in. long. Pseudo-bulbs oval-oblong, 2in. to 4in. long, furrowed, two-leaved. Caracas, 1854. (R. X. O. i., t. 99, No. 1.)

O. Warneri (Warner's). *fl.* five to eight in a short raceme; sepals oval, spreading; petals narrower and ascending; lip bright yellow, three-lobed, flat, the middle lobe deeply parted into two roundish lobes. Autumn. *l.* linear-lanceolate, recurved. Pseudo-bulbs ovate, ancipitous, with two leaves. Mexico. There are two varieties: *purpuratum*, sepals and petals white, streaked bright purple; and *sordidum*, sepals and petals dull yellow, streaked purple. [C.]

O. Widgreni (Widgren's). *fl.* light yellow, with bars of reddish-brown; petals as large as the lip; raceme about eight-flowered. *l.* solitary, 3in. to 4in. long. Brazil, 1889. Allied to *O. cornigerum*, but with much brighter-coloured flowers.

O. xanthocentron (yellow-spurred). *fl.* disposed in a dense panicle; petals hastate, having a dark spot over the base; lip dark, with a rhomboid, yellow centre. Andes. The contrast of colours in this species is very marked.

O. zonatum (zoned). *fl.* variable in form; sepals white; petals yellow, with tranverse, brown bands. Colombia, 1893. Allied to *O. bryolophotum.*

Large numbers of species not enumerated are also grown in botanical establishments, including: *O. abortivum, O. iridifolium* (of Humboldt), *O. orthostates, O. pictum, O. Schillerianum, O. trichodes, O. Trulla.*

FIG. 601. ONCIDIUM MARSHALLIANO-FORBESII.

Natural Hybrids.

NAME.	PARENTAGE.
caloglossum	Syn. *O. Marshalliano-Forbesii.*
elegantissimum	Syn. *O. Gardneri.*
flabelliferum	Syn. *O. Gardneri.*
Gardneri	*Forbesii* and *dasystyle.*
hæmatochilum	*luridum* and *Lanceanum.*
Larkinianum	Syn. *Marshalliano-Forbesii.*
Manlinii	Syn. *Marshalliano-Forbesii.*
Marshalliano - Forbesii (see Fig. 601)	*Marshallianum* and *Forbesii.*
pictorale	Syn. *Marshalliano-Forbesii.*
Pollettianum	Syn. *Gardneri.*
præstans	Syn. *Gardneri.*
prætextum	Syn. *Gardneri.*
Wheatleyanum	*crispum* and *dasystyle.*

ONCOMA. A synonym of **Oxera** (which *see*).

ONCORRHYNCHUS. A synonym of **Orthocarpus** (which *see*).

ONCOSPERMA. *O. tigillaria* is grown at Kew, but it is not in general cultivation.

ONE-SHIFT SYSTEM OF POTTING. This consists in moving a plant from the cutting-pot, or from the pot into which it was put as a seedling, into that in which it is intended to blossom or fruit. Soft-wooded plants—such as Pelargoniums—succeed very well on this system when potted on from a 3in. pot to one 6in. or more across. Tomatoes, again, answer very well on this system, but extra care in watering is necessary until the pots are filling with roots, otherwise the soil becomes sour and the plants unhealthy. Hard-wooded plants do not succeed well on the One-Shift System.

ONION. Besides the pests already described in connection with the Onion, there is one which promises to be more destructive than any yet recorded. This is a species of **Nematoid Worm** (which *see*, Vol. II.), now popularly called Eelworm. The species, *Tylenchus devastatrix*, does not confine its attention to one plant, but is found upon many, from Clover to Hyacinths. The symptoms of attack are chiefly a swelling of the infested bulbs, followed by a cracking; while the foliage is frequently distorted as well. The bulb, though apparently sound to the eye, nevertheless when handled is flabby, if not soft unto rottenness.

Once the disease asserts itself, it is difficult, if not impossible, to combat. All infested bulbs should be carefully lifted and *burned*. On no account should the same quarters be used for a similar crop the next season. As, too, the Nematoids may be present in the seed, care should be taken not to utilise any from an infested garden.

On the Continent the disease known as Onion Sickness is far more prevalent than here; but considering the quantities of seed obtained in this country from Continental establishments, it is easy to conceive how readily disease may be introduced into what was previously a perfectly healthy area.

The Welsh or Spring Onion, or Ciboul (*Allium fistulosum*), is cultivated the same as the ordinary variety, except that very little thinning is necessary, as the plants do not form bulbs. Though very hardy, the plants are of little value, and scarcely worth growing.

The following are all good additions to the varieties of Onions:

A 1. Bulbs large, deep, round, with a medium neck; skin brownish-yellow; flesh whitish, firm. An excellent keeper. Valuable alike for autumn or spring sowing.

Ailsa Craig. Bulbs very large, roundish, with a small neck; skin greenish-white; flesh very solid. This is probably the largest variety, and it keeps well. In 1895, Mr. J. Bowerman exhibited twelve Onions of this variety weighing 37½lb.; while single bulbs have been grown weighing 3lb. 9½oz.

Cranston's Excelsior. An excellent variety, and very similar to Ailsa Craig in size and appearance.

Crimson Globe. Bulbs medium, globular; skin glossy crimson. A fine variety for spring sowing, and a good keeper.

Giant Zittau. Bulbs round; skin deep yellow; flesh firm. A long keeper. One of the best for autumn sowing.

Silver Globe. Bulbs medium, globular; flesh firm. One of the mildest-flavoured varieties. An excellent cropper, and distinct from White Globe.

ONION SICKNESS. *See* under **Onion.**

ONOBRYCHIS. To the species described on p. 496, Vol. II., the following should be added:

O. laconica (Mount Laconia). *fl.* bright pink, large, disposed in a dense, oblong-cylindrical spike; peduncles very long. Summer. *l.*, leaflets seven to nine pairs, elliptic-linear. Orient, 1892. Plant stemless (or stem 1ft. high), silky-canescent.

O. viciæfolia (Vicia-leaved). According to the Kew authorities, this is the correct name of *O. sativa.*

ONOCLEA. These plants require an abundance of water at the roots all the year round, and are best adapted for planting out in the hardy rockery or Fernery, as pots scarcely afford them sufficient accommodation for the full development of their rhizomes or stolons, which, in some instances, extend a very long distance. The soil which Onocleas prefer is a compost of three parts good strong loam and one of leaf-mould. Great care should be taken that at all times of the year their roots are kept in a damp state. Some magnificently cultivated examples of these Ferns exist at the Botanic Gardens, Cambridge, where Mr. R. I. Lynch has had the good idea

Onoclea—*continued.*

of planting them close to the edge of a pond, with the result that *O. sensibilis* (see Fig. 602) rivals in size and majesty the Royal Fern (*Osmunda regalis*) itself.

Onocleas may be increased by means of spores, but their propagation is effected usually by division of their underground rhizomes, or of their stolons, from October to March.

FIG. 602. ONOCLEA SENSIBILIS, showing Habit and Portions of Fertile Frond and Barren Leaflet.

To the species described on p. 497, Vol. II., the following variety should be added:

O. germanica recurva (recurved). *fronds* having the edges of the pinnæ rolled or recurved, which imparts a light and charming appearance. 1889. This is frequently found catalogued as *O. pennsylvanica recurva.*

ONONIS. SYN. *Anonis. O. hispanica* is now regarded as a variety of *O. Natrix. O. arvensis* (Rest harrow) is the correct name of the British *O. spinosa.* Of the well-known *O. rotundifolia* there is a beautiful variety in *O. r. splendens.*

ONOPORDON. *O. horridum* is a synonym of *O. illyricum.*

O. tauricum (Taurian). *fl.-heads*, involucral scales lanceolate, rigid, somewhat viscous, the outer ones widely spreading. *l.* decurrent, sinuate, spiny-toothed, greenish on both sides. Stems erect, branched, pubescent. South Europe. Hardy biennial. SYN. *O. virens.*

O. virens (strong). A synonym of *O. tauricum.*

ONOSERIS. Including *Isotypus.* To the species described on p. 498, Vol. II., the following should be added:

O. purpurata (purple). *fl.-heads* purple; florets exceeding the involucre; scape branched to the middle, three-headed. *l.* radical, densely tomentose beneath, lyrate; terminal lobe the largest, somewhat deltoid-hastate. Colombia. An almost stemless, greenhouse perennial.

ONOSMA. To the species described on p. 498, Vol. II., the following should be added:

O. albo-roseum (white and pink).* *fl.* white, in a few days changing to deep rose, sub-sessile, pruinose-velvety; corolla nearly 1in. long; raceme simple, rarely bifid. *l.* hoary-grey, oblong, obtuse, attenuated into the petioles; cauline ones sessile. Asia Minor, 1890. A beautiful hardy perennial or under-shrub.

O. pyramidalis (pyramidal). *fl.* drooping, in nodding, short racemes; corolla bright scarlet, fading to lilac, about as long as the sepals, with a rather contracted, truncate mouth. October. *l.*, radical ones numerous, rosulate, 10in. to 12in. long, nearly 1in. broad, narrow-lanceolate, acuminate; cauline ones 4in. to 6in. long, sessile, lanceolate, acuminate. Stem 1½ft. to 2ft. high, stout, terete, pyramidally branched. Western Himalayas, 1886. A greenhouse or half-hardy plant, covered with white hairs. (B. M. 6987.)

O. tauricum (Taurian). A form of *O. stellulatum.*

ONYCHIUM. Although four species belonging to this genus are known in cultivation, the two most extensively grown, *O. auratum* (see Fig. 603) and

Onychium—*continued.*

O. japonicum (see Fig. 604), are extremely elegant, and possess some useful decorative qualities. Their fronds are so light and finely cut, and of such a pleasing colour, that they are specially adapted for mixing with

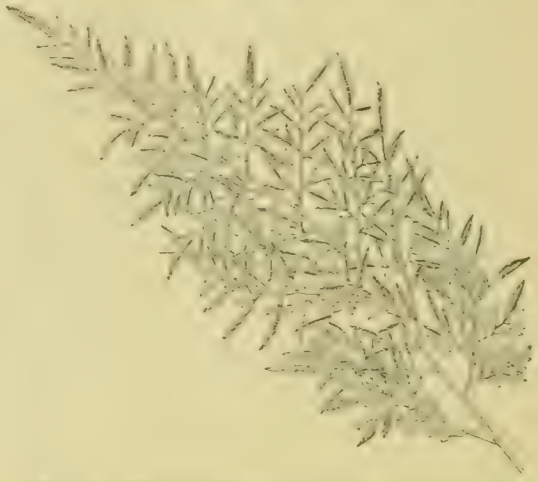


FIG. 603. FERTILE FROND OF ONYCHIUM AURATUM.

cut flowers, amongst which they look as graceful as some of the finest Adiantums, and remain fresh much longer. While *O. japonicum* thrives well in a cool house—in fact, will not stand stove treatment, under

FIG. 604. ONYCHIUM JAPONICUM.

which it is soon attacked by Thrips—*O. auratum* requires a stove, or at least a good intermediate house, all the

Onychium—*continued.*

year round. The same compost suits them both, viz., a mixture of fibrous loam, peat, or leaf-mould, and silver-sand, in about equal proportions. Both should be potted loosely, as they have a great aversion to hard soil at any time. Care must also be taken to ensure their fronds being kept dry at all seasons, as if allowed to get wet they soon turn to a darkish-brown colour and begin to decay. *O. japonicum* is easily propagated from spores, which germinate freely, or by division; but the same cannot be said of *O. auratum*: the fact of its forming only single crowns prevents its increase by division. The only mode of dealing effectually with this handsome species is, therefore, by means of seedlings, which come up freely enough, but which have a natural tendency to damp off just above ground while in a young state. In potting or planting *O. auratum*, the utmost care should be taken to keep the crown well above the surface of the soil, which must be thoroughly drained.

ONYCHIUM (of Blume). A synonym of **Dendrobium** (which *see*).

OOSPORA ABIETINUM. This fungus is responsible, according to Oudemans, for the shedding of the foliage of certain well-known species of *Abies*—*A. Nordmanniana* and *A. Pinsapo* to wit. It is a very minute species, and the only preventative seems to lie in collecting and burning the shed foliage.

OOSPORE. A technical name for a spherical, dark-coloured, smooth body found in fungi, and more popularly known as a resting spore. It results from the fertilisation of an oosphere, a rounded ball of protoplasm, which Professor Marshall Ward popularly translates as an incipient egg, the egg itself being the oospore. The actual process is set out in Vol. III., under **Peronospora**, p. 81; and an oospore, much magnified, is illustrated in Fig. 91.

OPERCULARIA UMBELLATA. A synonym of **Pomax umbellata** (which *see*).

OPHIOGLOSSUM. Snake's Tongue. Including *Rhizoglossum*. Although none of the Ophioglossums are what may be termed very ornamental, yet several of them should be grown, as they deservedly are in some of our best collections as great curiosities. They are useless as pot plants, and succeed best when planted out in the Fernery, where a naturally damp spot should be prepared for them. The compost should consist of fibrous loam and half-decayed sphagnum in about equal proportions, with an admixture of sand, in which their fleshy roots plunge with avidity. Ophioglossums are not aquatic plants; therefore, although requiring a constantly moist situation, they must not on any account be planted where there is any stagnant water. Propagation is usually effected by division. We are not aware that any seedlings have ever been raised artificially.

O. japonicum (Japanese). A synonym of *Lygodium japonicum*.

OPHIOPOGON. *O. intermedius* (SYN. *Fluggea intermedia*) is now regarded as a distinct species, and not as a variety of *O. japonicus*; there is a form of the latter, *variegatus*, having the leaves striped with yellowish-white. *O. spicatus* (of Ker) is a synonym of *Liriope spicata*.

OPHIOSCORODON. Included under **Allium** (which *see*).

OPHIOSTACHYS. A synonym of **Chamælirium** (which *see*).

OPHISPERMUM. A synonym of **Aquilaria** (which *see*).

OPHRYS. Three species of this genus are included in the British Flora, viz.: *O. apifera*, *O. aranifera*, and *O. muscifera*. To those described on pp. 500-1, Vol. II., the following should be added:

O. Bertolonii (Bertoloni's)* *fl.* of medium size, having the sepals and petals pale rose and the lip dark maroon. Italy, 1889. A handsome species.

O. bombyliflora (Bee Flower). The correct spelling, according to the Kew authorities, of *O. bombylifera*.

OPIUM POPPY. *See* **Papaver somniferum.**

OPLISMENUS. To the plants described on p. 501, Vol. II. (both of which, according to the "Index Kewensis," are forms of *O. compositus*, a cosmopolitan species), the following should be added:

Oplismenus—*continued.*

O. Burmanni albidus (whitish). *l.* mostly white, with a green stripe along the midrib. India, 1836. A pretty, stove or greenhouse Grass, of dwarfer and more compact habit than the common variegated form, *O. B. variegatus* (described as *Panicum variegatum*, of gardens, on p. 19, Vol. III.).

O. imbecillis variegatus (weak, variegated). A garden name for *O. Burmanni variegatus*.

OPOPANAX CHIRONIUM. According to the "Index Kewensis," this is the correct name of **Malabaila Opopanax** (which *see*).

OPUNTIA. To the species described on pp. 502-4, Vol. II., the following should be added:

O. Arbuscula (small tree). *fl.* greenish-yellow, tinged with red, 1½in. across; petals few. June. Trunk woody, about 4in. thick, 7ft. to 8ft. high, with green bark; branches numerous, slender, copiously jointed; ultimate joints 3in. long, ¼in. thick, slightly tubercled and bearing tufts of whitish spines nearly 1in. long. Mexico. A remarkable, stove species.

O. arenaria (sand-loving). *fl.* 2in. across. May. *fr.* 1in. long, bearing a few short spines. Stems spreading, forming a tuft 3ft. through and 1ft. high; joints 1½in. to 3in. long and nearly as broad, terete, with very prominent tubercles and numerous tawny bristles; upper spines 1in. to 1½in. long, white, with a yellow point, the shorter ones hair-like and curled. Mexico. Stove. Requires a very loose, sandy soil.

O. camanchica. *fr.* deep red, oval, 2in. long, sweet and juicy. Stems prostrate and extensively spreading, with ascending, obovate-orbicular joints 6in. to 7in. long; bristles greenish or yellowish-brown; spines one to three (or marginal ones three to six), reddish-brown to blackish-brown. Texas, Colorado, &c. Hardy.

O. c. albispina (white-spined).* A pretty, white-spined variety.

O. c. major (greater). A variety having very large, obovate joints.

O. c. minor (lesser). A variety with small, prickly joints.

O. c. orbicularis (orbicular). A strong-growing form, having large, roundish, thin, bluish-grey-green joints beset with long, light brown spines. Colorado, 1899.

O. c. rubra (red). *fl.* dark brownish-red, becoming carmine at margins and outside, 2½in. across; stamens yellow; ovary slender and not prickly.

O. c. salmonea (salmon). This is a remarkable colour-variety. At first it is a glossy chamois, but afterwards changes to a salmon.

O. clavata (club-shaped). *fl.* yellow, 1½in. across. *fr.* lemon-yellow, 1½in. long, with clusters of bristle-like spines. *l.* ¼in. long. Stem short; joints club-shaped, 2in. long, 1in. broad, narrowed to both ends; cushions ¼in. apart, composed of various-sized spines up to 1in. long. New Mexico, 1854. Stove.

O. cylindrica cristata (crested). A dwarf, cockscomb variety, with the leaves and white hairs growing all along the wrinkled top of the "comb." Stove.

O. dearmatus (without prickles). This belongs to the *papyracantha* group, but is smaller, with small bunches of fine, short spines. Chili.

O. decipiens. The correct name is *O. imbricata*.

O. decumana (huge).* *fl.* orange, large. Summer. *fr.* brownish-red, watery, oval, 4in. long, spiny; flesh red, sweet. Stem hard, woody, brown-barked, bearing an enormous head of elliptical flat joints each 12in. to 20in. long and about 1ft. broad, smooth, greyish-green, with a few scattered cushions of very tiny bristles and sometimes a spine or two. Brazil, 1768. Stove. The largest species in cultivation; it is said to be what is known in Malta as the Indian Fig. SYN. *O. maxima*.

O. dejecta (debased). *fl.* scarlet, with elongated stamens. Stems cylindrical; branches pendent; joints erect-divaricate, much compressed, narrow, elongated; areolæ remote, scarcely tomentose; upper prickles setaceous, whitish, the lower ones white. Cuba, 1840.

O. diademata (diademed). *fl.* unknown. Stem short, erect, composed of globose, superposed joints, greyish-green, very succulent; topmost joint pear-shaped, with a tuft of whitish hairs and spines on the apex, out of which the new growth pushes; cushions large, 1in. apart, with a tuft of short grey hairs and spines, and a curving large spine. La Plata. Warm greenhouse. A ten-year-old plant at Kew is only 4in. high.

O. echinocarpa major (larger). Stem 4ft. high; joints 8in. to 10in. long; spines long, sheathed.

O. Emoryi (Emory's).* *fl.* sulphur-yellow, tinged with purple, 2½in. across. August and September. *fr.* 2½in. long, 1in. thick, covered with cushions of bristles and spines. Joints cylindrical, curved, 4in. long; tubercles very prominent, longitudinally attached, the tips crowned with cushions of short bristles and numerous radiating spines, some 2in. long and very strong. Mexico. Warm greenhouse.

O. ferox (fierce). *fl.* unknown. Stems not articulated, compressed, branched, somewhat tuberculate; areolæ clustered,

Opuntia—*continued.*

convex, the upper part yellow, bristly, the lower bearing four to six unequal, whitish prickles. Warmer parts of America, 1819.

O. filipendula (drooping-threaded).* *fl.* purplish, 2½in. in diameter, very handsome. May and June. Stems about 1ft. high, spreading; joints flat, round or oval, about 3in. long, often less, bluish-glaucous; cushions ½in. apart, composed of a little tuft of white, woolly hair, and a cluster of erect, rather strong bristles; spines usually one to each cushion, slender, deflexed, white, 1in. to 2in. long, but absent from some joints. Mexico. Stove. See Fig. 605.

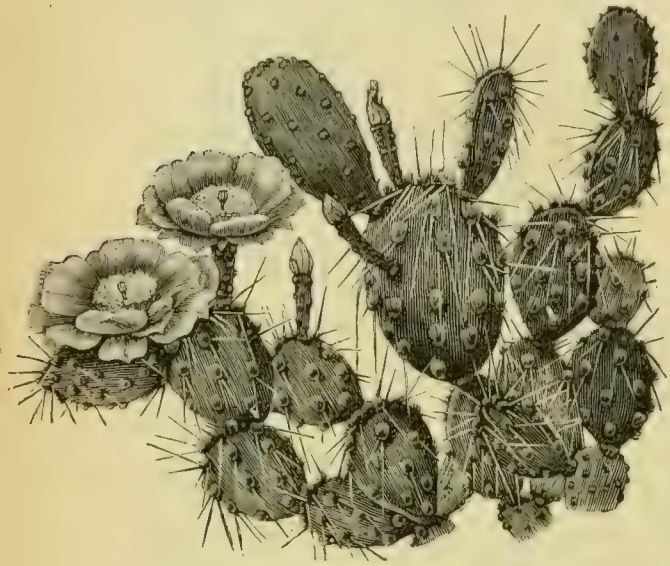


FIG. 605. FLOWERING BRANCHES OF OPUNTIA FILIPENDULA.

O. formidabilis (formidable). Plant deep glaucous-green. Stems short and thick, and covered with white, stiff spines 6in. or more in length. Chili.

O. frutescens is a form of *O. leptocaulis.*

O. fulgida (shining). *fl.* bright pink, fading to purple, cup-shaped, usually less than 1in. in diameter. July and August. *fr.* fleshy, 1in. to 1¼in. long, ovate. Stems 5ft. to 12ft. high, arborescent, flexuous, with a few divaricate branches; joints clustered at their ends, 3in. to 8in. long, very spiny, dull greyish, inclining to olive; spines 1in. to 1¼in. long, stellate. Arizona, &c., 1895. (G. & F. 1895, p. 324, f. 46.)

O. Grahami (Graham's). *fl.* yellow, 2in. across, borne on the ends of the ripened joints. June. *fr.* 1½in. long, stellate-spiny. Joints 2in. long, cylindrical, with adpressed tubercles ½in. or more in length, each bearing a tuft of long, radiating spines. Roots thick and fleshy. Mexico. Stove.

O. horrida (horrid). A variety of *O. Tuna.*

O. humilis (dwarf). A synonym of *O. Tuna.*

O. hystricina (porcupine-like). *fl.* yellow, large. *fr.* 1in. long, spiny. Plant spreading; joints 3in. to 4in. long and broad; cushions rather large, ½in. apart, with numerous spines varying in length from ½in. to 4in., and short, yellowish bristles. San Francisco Mountains. Probably hardy.

O. imbricata (imbricated) The correct name of *O. decipiens.*

O. inermis (unarmed). A synonym of *O. stricta.*

O. invicta (invincible). *fl.* yellow, 2in. across, abundant. *fr.* covered with reddish spines. Plant low, branching; joints 4in. long, 3in. thick, with star-like tufts of about twenty flattened spines, the shortest 2in. long. California. "This may be a Cereus, but it groups well enough with *O. Schottii* to be retained for the present in *Opuntia*" (Coulter).

O. leucotricha (white-haired).* *fl.* variable. June. *l.* in young plants small, subulate, bright red. Stem erect; joints flattened, ovate or oblong, having numerous cushions, ½in. apart, of soft bristles, with a large central spine and a few shorter ones, all rigid and needle-like when young, but lengthening with age and becoming soft and curled like stiff, white hair. Mexico, 1836. Stove. A beautiful species.

O. lucida (clear).* *fl.* yellow, Rose-like in shape, large, fragrant. Stems 3ft. to 4ft. high; branches covered with a network of shining spines. Habitat not recorded, 1889.

O. lurida (lurid). Candle Cactus. A tree-like plant, with elongated tubercles. *fl.* dark yellow, Rose-shaped, with dense centre of stamens. Stems slender, with short, fine but strong spines.

Opuntia—*continued.*

O. macrocentra (large-spurred).* *fl.* bright yellow, 3in. across, borne on the upper edges of the youngest joints. May and June. Joints flat, large, almost circular, thinly compressed, usually purplish; cushions 1in. apart, with greyish spines, often 3in. long and generally pointing downwards. *h.* 3ft. Mexico. Intermediate. A rare but desirable species.

O. macrorhiza (large-rooted). *fl.* yellow, large and beautiful. Summer. Stems cylindrical at maturity; joints flattened, battledore-like, with deciduous spines longer than the tufted bristles on the stems, the newly-developed joints having small leaves; roots thick and fleshy, having the appearance of Potatoes, and supposed to be edible. Texas. This is now regarded as a form of *O. Rafinesquii.* See Fig. 606.

O. maxima (largest). A synonym of *P. decumana.*

O. microdasys rufida (reddish). A variety with reddish-brown bristles.

O. missouriensis. The correct name is *O. polyacantha.*

O. monacantha variegata (variegated). A very desirable variety, showing white and green variegation.

O. occidentalis (Western).* *fl.* orange-yellow, nearly 4in. across, borne on the ripened joints. June. *fr.* 2in. long, juicy but sour. Stem stout, woody, with numerous wide-spreading branches often bent to the ground; joints 9in. to 12in. long, 6in. broad, flattened, sometimes 100 on a plant; cushions nearly 2in. apart, with small, closely-set bristles, and straight spines ½in. to 1½in. long. California. A fine plant where room can be afforded; it requires rough, stony soil. Possibly hardy.

O. pachyclada rosea (thick-branched, pink). This is described as "a small-jointed, dwarf, spreading form, which is probably a hybrid between *O. fragilis* and *O. xanthostema.*" Colorado, 1899. Hardy.

FIG. 606. FLOWERING BRANCHES OF OPUNTIA MACRORHIZA.

O. papyracantha. This species (see Fig. 607) is one of about half-a-dozen characterised by flat, paper-like spines, and which form a group called *Platyacantha.* *O. diademata* and *O. Turpinii* are other members of this group.

O. Parryi (Parry's). *fl.* yellowish-green, 1½in. across, borne on the terminal joints. Stem short; joints club-shaped, 4in. to 6in. long, very spiny; cushions elevated on ridge-like tubercles; bristles few, coarse and long; spines very numerous, ½in. to ½in. long, the central one broad and flattened, the rest triangular. Mexico. Intermediate.

O. Piccolominiana (Piccolomini's). Plant robust, oval-bladed, glaucous-green; blades thick, with cushions of short, white spines. This is regarded by some as a variety of *O. robusta.*

O. plicatus (folded). Tree-like, and bearing long, white spines.

O. plumosa nivea (white). This is a curious and somewhat remarkable plant, from the fact that it bears long, white, flat, papery spines, somewhat resembling wood shavings. By some authorities regarded as a variety of *O. papyracantha.*

O. polyacantha (many-spined). The correct name of *O. missouriensis.* (B. M. 7046.) The following are varieties: *albispina*, fruit ovate, spines white, bristles straw-coloured; *erythrostema*, flowers yellow, with bright red stamens; *platycarpa*, fruit flattened or depressed, spines few, bristles straw-coloured; *salmonea*, flowers clear yellow at first, becoming deep orange and eventually salmon; *trichophora*, bristles and spines white, the latter twisted, old joints having a hoary appearance.

Opuntia—*continued.*

O. polyantha (many-flowered). *fl.* pale sulphur-yellow, 1¾in. in diameter; stamens white; style five- to seven-cleft. July to October. Stem sub-erect; joints oblong, 6in. to 8in. long; areolæ slightly spaced, furnished with yellow hairs and six to eight sub-equal, yellow spines marked with brown. *h.* 3ft. South America, 1811. SYN. *Cactus polyanthos* (B. M. 2691).

O. Rafinesquii arkansana (Arkansas).* *fl.* light yellow, 3½in. across. June and July. Hardy.

O. ramosissima (much-branched). A synonym of *O. tessellata*

O. rhodantha (red-flowered).* *fl.* silky carmine, 3½in. across, having the corolla and filaments red, the anthers yellow, the stigma green, and the ovary smooth. June. Joints obovate, covered with long glaucous spines. Colorado, 1896. Hardy.

O. r. brevispina (short-spined). *fl.* large. Joints rather large, thick, obovate, dark greyish-green; spines reddish when young. Colorado, 1899.

O. r. flavispina (yellow-spined). Joints thinner than in *brevispina*; spines longer, yellow on young joints, with a darker point. Colorado, 1899.

O. rosea (rosy).* *fl.* bright rose, 2in. across, borne on the ends of the ripened growths of the year, usually clustered. June. Stem erect, freely branching; joints 2in. to 6in. long, cylindrical; tubercles ridge-like, bearing on their points small cushions of very fine bristles, and tufts of pale yellowish spines about ½in. long all pointing upwards. Brazil. A distinct and handsome, but rare species.

O. Scheeri (Scheer's). *fl.* not known. Plant shrubby, branched, upright, green. Joints oval, nearly rhomboidal, or reversed egg-shaped; areolæ woolly; spines twelve or less, citron-yellow, thin, brittle, ¼in. long. *h.* 3ft. Mexico.

O. Schwerini (Schwerin's). *fl.* bright greenish-yellow. Joints small, shortly obovate, thickly beset with slender, white spines. Colorado, 1899.

O. spinosissima (very spiny). *fl.* reddish-orange, 2in. across. June. Stem erect, woody (becoming cylindrical with age, and sometimes devoid of branches for about 5ft. from the ground); joints very flat and thin, deep green, ovate or rounded, 6in. to 12in. long; cushions 1in. apart; bristles very short; spines in clusters of about five, the longest 2in. long, brownish-yellow. *h.* 20ft. South America, 1732. Stove. Probably a form of *O. Tuna*.

FIG. 607. OPUNTIA PAPYRACANTHA.

O. stricta (erect). *fl.* yellow, 3in. across. July. *fr.* pyriform, dark violet, not edible. Plant erect; joints obovate, 14in. long, 3in. to 5in. broad, slightly or not at all spiny, but furnished with very numerous small bristles. *h.* 1½ft. to 2ft. Tropical America, 1796. SYN. *O. inermis*.

O. subulata (awl-shaped).* *fl.* dull purple, small. Spring. *fr.* pyriform, 4in. long; seeds nearly ½in. across. *l.* green, subulate, 2in. to 5in. long. Stem erect, cylindrical, 2in. thick, channelled and tubercled above; joints long and branch-like, with tufts of short white hairs on the tips of the tubercles, and one or two white spines ½in. to 1in. long. South America. A handsome, warm greenhouse species.

O. tessellata (tessellated). *fl.* purple, 2in. across. Stem thick, with dark grey, scaly bark; branches clothed with ash-grey tubercles, each bearing a small tuft of wool and a stout, straight, yellow spine 2in. long, enclosed in a loose, yellow sheath. *h.* 2ft. to 6ft. California, &c. A bushy plant. SYN. *O. ramosissima*. There is a crested variety of this, which is beautiful if somewhat scarce.

O. tetracantha (four-spined). *fl.* greenish-purple. *fr.* bright scarlet, ovate. Stem and joints cylindrical, covered with

Opuntia—*continued.*

prominent tubercles bearing tufts of brown bristles and straw-coloured, flattened, deflexed, loosely-sheathed spines. *h.* 2ft to 5ft. Arizona, 1896. A branched shrub.

O. tomentosa (downy). *fl.* reddish. Plant erect, of a pleasing green, tomentose; joints lanceolate, compressed, 6in. long, obovate or lanceolate, tubercular; spines all bristly, scarcely exceeding the tomentum. *h.* 2ft. Mexico, 1820.

O. Tuna horrida (horrid). Stem stout, erect; joints flattened; cushions 1in. apart, composed of short reddish bristles and long tawny-red spines, about eight in each cushion, having a very ferocious appearance. Probably Mexico, 1795.

O. Whipplei (Capt. Whipple's).* *fl.* red, 2in. across, clustered. June. *fr.* 1in. long. Stem usually prostrate, with slender, elongated branches, which are cylindrical when old, and broken into short joints when young; joints 2in. to 12in. long, less than 1in. in diameter; cushions small, round; spines white, variable, one 1in. long, the rest smaller. Mexico. A free-flowering, stove species.

O. xanthostema (yellow-stamened). *fl.* of a carmine-red, having dark yellow filaments and a prickly ovary. Colorado, 1896. Hardy.

O. x. fulgens (bright).* *fl.* vivid crimson, superior in colour to the type.

O. x. orbicularis (orbicular). Joints medium-sized, roundish, dark greyish-green; spines brown when young. Colorado, 1899.

O. x. rosea (rosy).* A profuse variety bearing rosy-carmine flowers.

ORANGE RUST OF ROSES. *See* **Rosa—Fungi.**

ORANGE THORN. *See* **Citriobatus.**

ORANIA. To the species described on p. 508, Vol. II., the following should be added:

O. nicobarica (Nicobar Islands). A synonym of *Bentinckia nicobarica*.

O. nivea (snowy). "A tall Palm, of vigorous growth, with large, shining green leaves, white on their under-surface" ("Kew Bulletin"). Habitat not recorded, 1886.

O. philippinensis is grown at Kew, but is not in general cultivation.

ORBIGNYA (a commemorative name). ORD. *Palmæ* A small genus (five or six species) of stove, unarmed, dwarf or tall palms, closely allied to *Jubæa*, natives of Bolivia and Brazil. *O. Lydiæ* and *O. Sagotii* are included in the Kew Collection, but they are not in general cultivation.

ORCHIDANTHA. A synonym of **Lowia** (which *see*).

ORCHID HYBRIDISATION. Although the art of Orchid Hybridisation may still be termed as in its infancy, there cannot be two opinions as to the prominent part it must play in the future. The collector carries on his work of destruction when procuring the various species which, as in the case of *Odontoglossum crispum*, are put upon the European markets by hundreds of thousands annually. This, combined with the spread of civilisation, the pressure of cultivation, and the gradual pressure of a dense population, will ultimately result in the extinction of many of the most popular species now in cultivation. If any illustration of this fact were necessary, we need only refer to our native hardy *Cypripedium Calceolus*, which has become virtually extinct in this country, but owing to its extensive distribution over central Europe it is still comparatively plentiful in places. Though the process of extinction may be slow, the fact remains of its gradual progress. It is thus, then, that we shall have to depend on the work of the hybridist to retain the species by raising them from seed, as well as by procuring new sorts by the act of cross-fertilisation.

The art of Orchid Hybridisation was first introduced by the late Mr. J. Dominy, in the nurseries of Messrs. J. Veitch and Sons, at Exeter. Mr. Dominy, upon the suggestion of Dr. Harris, a surgeon of that town, commenced his experiments in 1852. It was in October, 1856, that the first hybrid (*Calanthe Dominii*) flowered. Mr. Dominy carried on the work successfully among the various sections of the Orchid family for twenty years, having flowered during that time about twenty-five hybrids—the last, and probably the best, being "Lælia," now classed as *Lælio-Cattleya Dominiana*, which flowered in 1878.

Mr. Seden, who succeeded Mr. Dominy in this department, has been most successful in introducing hybrids of sterling merit. Other nurserymen, gentlemen, and gardeners in private establishments have successfully taken up the work in such earnest that there is scarcely a place in this

Orchid Hybridisation—*continued.*

country in which Orchids are appreciated but that contain seedlings of some of the different species. Continental and American horticulturists have also developed the work successfully.

There are many in the past who have hesitated and delayed experimenting in raising seedlings. One of the principal reasons for this delay has been the common but erroneous notion that it takes practically a lifetime before the plants raised from seed may be induced to flower. True, it has taken over twenty years in the bygone days to induce plants to flower, but it must not be overlooked that horticulturists generally have many facilities afforded which were not vouchsafed to our forefathers; and with the more advanced principles to assist us, we are enabled to considerably minimise the time that elapses between the sowing of the seed and the flowering of the plants.

The writer of these notes has been successful in flowering plants in two years from the time of sowing the seed, and there are very few indeed of the large family of Orchids which, with proper treatment, would require more than five or six years to reach the flowering stage. The injury caused to plants used for Hybridisation purposes has been another detrimental consideration to the development of the general spread of Hybridisation. There is no denying that in many cases the strain of fructification does considerably distress the plants, and it frequently takes two or three years for plants so affected to regain their normal conditions; but surely if a crop of seedlings are procured there is ample repayment for the sacrifice of the mother-plant. The more general practice of Hybridisation is sufficient illustration to indicate that most of these unfavourable considerations are now being overcome.

Selecting Plants. The chief thing to be considered in the selection of the seed-bearing parent is general good health and condition. One cannot expect to procure satisfactory seeds from plants having weakly constitution, or that are in a condition that they are unable to retain their seed-pods for the lengthened period required for them to develop and mature their seeds. Plants in an unsuitable condition quickly show signs of the strain placed upon them, by the early shrivelling and sinking of the pseudo-bulbs. Although the seed-pod may go on for the full period usually required for development, it will be found that at the time of bursting very little, if any, seed will be contained in the interior, and that only a fluffy substance, very light in colour, remains. To get satisfactory results, therefore, it is advisable to give due consideration to the condition of each plant before using it for Hybridisation purposes.

The selection of species must also be considered. It is useless to expect satisfactory results unless some little forethought is given. Superior kinds should be selected, and those widely distinct from each other. It does not always follow that the superior qualities of one parent will atone for the shortcomings of the other into which it has been crossed. As an illustration of this, we would draw attention to the fact that *Cypripedium Spicerianum*, one of the finest species of the genus, has been used as one of the parents in the production of over one hundred distinct crosses, yet it would be difficult indeed to select a dozen among these which are of exceptional merit.

In the selection of parents to produce new varieties, we would suggest that the list of hybrids contained at the end of each of the genera should be used as a guide to that end, and also for the reproduction of those varieties which have already appeared and which have proved of sterling merit. There is a wide field of possibilities still open to the hybridist in the direction of bigeneric hybrids. With the exception of Cypripediums, the construction of the flowers in almost the whole of the Orchid genera is favourable to the production of seedlings by cross fertilisation. The efforts in this direction, although limited up to the present, have produced satisfactory results: one of the finest of these is to be found in *Epiphronites Veitchii*.

Most Suitable Time for Fertilising the Flowers. During the bright months of the year (March to September) there need be very little consideration given to this matter, but for choice we should advise the morning portion of the day for the purpose. During the duller months of the year we prefer operating when the sunlight is strongest, from, say, ten to two o'clock. Owing to the prevalence of dull weather in the winter

Orchid Hybridisation—*continued.*

months, especially in the fall of the year, it is a difficult matter to attain success, for after the flower has been fertilised the decaying portions of the segments frequently convey decomposition to the more sensitive portions of the flowers after fructification has considerably advanced, causing the whole to rot.

Period between Fertilisation and Fructification. There can be no doubt but that here, as in other members of the Vegetable Kingdom, fructification commences immediately the sexual portions of the flowers are brought together. In the case of Oncidiums, Cattleyas, Lælias, Odontoglossums, &c., the segments of the flowers begin to wither within a few hours. In fact, we have observed that insects coming into contact with the stigma frequently set up sufficient irritation to cause the flower to wither and decay.

Treatment after Fertilisation. To procure good seed it is advisable that the plants carrying seed-vessels should be afforded every encouragement that will be likely to assist in its production. One of the principal considerations, therefore, is that they should be afforded all the available light. It is not necessary to place the plants in such a position that the direct rays of the sun may destroy the foliage and otherwise unduly distress them; but at the same time, every encouragement must be given that will assist them to properly ripen the pods, or good seed cannot possibly be procured. A position near the roof-glass generally satisfies their requirements in this direction.

The period that elapses between fertilisation and the ripening of the seed-pods differs very considerably. In the case of the South American Sclenipediums, a few months suffice for the pods to reach maturity; but with

Fig. 608. Orchid Seedlings Germinating (Two Months).

Cattleyas and Cypripediums, from nine to fifteen months elapse before the seed-vessels are mature, which is indicated by the bursting of the pod. The longer the seed-pod remains on the plants, the greater are the possibilities of procuring good seeds. As soon as it is discovered that the seed-pods are bursting, they should be carefully tied up in tissue-paper, so that the seed, should it drop, may be secured. It generally takes a considerable time for the outer portions of the seed-pods to become dry, especially if allowed to remain on the plants. It is advisable, therefore, to remove them from the plants, and place them under such favourable conditions as may facilitate the ripening process. The seed will be ready for sowing as soon as it can easily be shaken out of the pod.

Methods of Sowing Seed. The old system of sowing the seed of Orchids on an established plant of the same genera, is one that is most satisfactory in

Orchid Hybridisation—*continued.*

such cases as Cypripediums, Phaius, and others of this section; but there are other cases—say where the plants require a season of rest—in which it would be exceedingly undesirable to sow seed, for it would mean the sacrifice of the old plant if the requirements of the seedlings are to be supplied.

As there are other means of raising plants from seed, it is not advisable to sow Cattleyas, and their allies, or Dendrobiums on the plants of their respective genera. Another method of sowing seed is to procure a piece of pitch-pine, bruise it well, and either suspend it in a moist position as a raft or place small pieces in pans, first soaking the material in water, and then sowing the seed while wet. Rough sawn pieces of white deal, such as would be cut from the sawing asunder of a scaffold-pole, is a most suitable surface on which to sow the seed; but for this system it is necessary that the conditions should be fairly hot and a high state of humidity be retained at all times. The blocks should be fitted into pans and suspended near the roof-glass.

One of the best systems we have found for the raising of Cattleya seedlings is to fill shallow pans about one-third their depth with clean, broken crocks, filling in the remaining portion with the coarse Fern roots left when picking the peat for potting, broken small and mixed with a little charcoal. This should be thoroughly wetted before the seeds are sown. Fig. 608 represents a pan of this description with Cattleya seedlings two months from the sowing of seed. Cocoa-nut fibre is favoured by some as a suitable surface on which to sow the seeds, but we find that it commences to decay too early, and the surface has a tendency to become sour, although we have no doubt that shut up in a propagating-case it would answer the purpose admirably. Whichever system is adopted, it is absolutely necessary that the surface should be thoroughly wet before commencing to sow the seeds; for if sown on a dry surface, they are so light that they quickly become floated, and are thus easily washed from their position to destruction.

The period that elapses between the sowing and germination of the seeds varies considerably. Sometimes indications of the vitality of the seed may be observed in from seven to ten days. In other cases we have

FIG. 609. ORCHID SEEDLINGS (Six Months).

known the seed to come up after having been sown two years; cases also frequently occur in which the first batch of the seed has made its germination quickly, while others sown at the same time, even on the same receptacle, will continue to make their appearance for two or three years afterwards. The treatment of the seed from the time of sowing up to the rooting period

Orchid Hybridisation—*continued.*

of the plants that have germinated therefrom is an operation that requires considerable care and judgment. The principal item, of course, is the watering. To dip the tiny, dust-like germs of seed when in a dry state would result in floating the seeds from off the surface of the material on which they had been sown. To water carelessly, even from the finest rose on the water-can, quickly displaces the growing seedlings, and they are thus washed over the sides of the pots and are lost. It is therefore necessary to take precautionary measures to prevent this, and the best means of overcoming the difficulty is to use a small spray diffuser, similar to those

FIG. 610. ORCHID SEEDLINGS (Two Years)

found in florists' shops; the water is forced out in a fine mist-like spray by means of a small air pump, which is attached. This we find answers the purpose admirably. The periods between sprayings will vary according to the outside conditions of the atmosphere. In bright, warm weather the seedlings will require damping twice a day; but in dull, cool weather probably once or twice a week will be sufficient. This is best judged by the operator. Care must also be observed to prevent the small seedlings from becoming dry, especially if these are hung in a light position near the roof-glass. Seedlings, if once allowed to become dry, shrivel, the tiny plants rarely regain their normal condition, and gradually dwindle and die. Excess in either case must be avoided.

POTTING SEEDLINGS. The best time at which to remove the seedlings is just at the period after which the first or seed-leaf has reached maturity, and when the miniature root makes its appearance. We advocate that the sooner the plants can be induced to become established in their independent pots the better. The accompanying illustration (Fig. 609) will give a fair indication of the condition of the plants when they may be safely handled, provided that the roots are in an active condition, and the plants, as far as growth is concerned, are in a dormant condition. We would prefer their being potted before the stage indicated in the illustration, so that the roots shown might in the meantime have become established in the potting compost; but in a young stage they are very tender subjects to handle, and particular care is required lest they become injured in the operator's hands during transplanting. We advise those not familiar with the treatment of seedling Orchids to defer potting up the plants until they are sufficiently large to be conveniently handled. The size of the pots used depends on the

Orchid Hybridisation—*continued.*

vigorousness of the plants to be dealt with. There are pots about an inch in diameter that are most suitable for seedling Cattleyas, Dendrobiums, and such-like. Cypripediums, which are stronger rooting and of more vigorous constitution, may be treated more liberally as regards pot room. We find it best to plunge the tiny pots into pans of peat, which are then suspended close up to the roof-glass. The pots are filled to about half their depth with clean, finely-broken crocks; the potting compost consisting of finely-chopped peat roots and sphagnum in about equal proportions, and a little rough sand or broken charcoal may be added with advantage. After potting, the plants are thoroughly watered before being placed in their permanent position, after which every encouragement is given to induce the plants to grow freely.

As the plants advance, considerably more room will be annually required. It is not advisable, when the plants have become attached to the receptacle, to turn them out of the pots at the period when repotting is required, especially when we are dealing with Cattleyas in the early stages. It is better by far to remove all decayed and undesirable matter, and replace the same with clean drainage. Next procure a pot or pan of the desired size, and place the plant with the pot attached to the roots into it; after filling in with liberal drainage, cover the remaining surface with the potting material, which should become coarser as the plant reaches maturity.

FIG. 611. ORCHID SEEDLINGS (Four Years).

As the accompanying illustrations (Figs. 610 and 611) show, the plants, under favourable circumstances, make considerable advance after the first two years. The plants then may be more liberally treated; but one of the principal things to endeavour to prevent, as far as possible, is premature growth. If a plant commences a secondary growth immediately after, or perhaps before, the preceding growth reaches maturity, the chances are that a growth will be advancing during the whole period in which the plant should have been at rest. The consequence of this will be (especially if premature growth commences in autumn) that neither of the pseudo-bulbs will be properly ripened, they will be prone to decay during the dull winter months, and the future well-being of the plant will be very doubtful and uncertain. It is better to remove the plants to cooler and more airy conditions when growth is completed, so that they may have the full advantage of the resting season, returning them to their growing quarters as soon as there are traces of renewed vitality in the early spring of the year. Insect pests will have to be held in check by frequently cleaning the plants with a soft sponge and fumigating the houses. Wood-lice may be trapped with hollowed-out potatoes. Slugs and snails may be caught at night by placing a little bran near where they frequent, and picking them off with the aid of a light. Cockroaches are poisoned, or caught in jars half-filled with treacle-water placed about the stages and near their haunts.

ORCHIDOCARPUM. A synonym of **Asimina** (which *see*).

ORCHIDOFUNCKIA. A synonym of **Cryptarrhena** (which *see*).

ORCHIS. Including *Loroglossum.* The British Flora embraces nine species, viz.: *O. hircina* (Lizard Orchis), *O. latifolia* (Marsh Orchis), *O. laxiflora*, *O. maculata*, *O. mascula* (Early Orchis), *O. militaris*, *O. Morio* (Green-winged Orchis), *O. pyramidalis*, and *O. ustulata* (Dwarf Orchis). To the species and varieties described on pp. 520-1, Vol. II., the following should be added:

O. bicornis (two-horned). A synonym of *Satyrium cucullatum.*

O. lactea is a form of *O. tridentata.*

O. latifolia. The Glasnevin variety has tall spikes of rich purple flowers, heavily spotted with blackish-purple. 1895.

O. longicruris foliis-maculatis (spotted-leaved). In this variety the leaves are marked with large, irregular, brownish-purple blotches. 1884. (R. G., t. 1149, f. 3, under name of *O. undulatifolia foliis-maculatis.*)

O. maculata superba (superb).* *fl.* rich mauve, spotted and blotched purple; spikes dense, about 1ft. long. May and June. *l.* dark green, spotted purple. *h.* 1½ft. 1886. A vigorous-growing variety.

O. monophylla (one-leaved). *fl.* resembling those of *O. maculata* in size and marking; peduncle 6in. long, bearing a loose raceme. *l.* one or rarely two, sub-erect, oblong, 4in. long, folded at base, green, with large, purplish-brown spots. Tubers oblong. Birma, 1893. (Greenhouse. (B. M. 7601.)

O. undulatifolia (wavy-leaved). A synonym of *O. longicruris.*

O. coriophora, *O. globosa*, and *O. incarnata* are in cultivation in botanical establishments.

ORDEAL BEAN (of Old Calabar). *See* **Physostigma.**

ORDEAL-TREE. *See* **Tanghinia venenifera.**

ORDER. *See* **Natural Order.**

OREODAPHNE (of Nuttall). A synonym of **Umbellularia** (which *see*).

OREOPANAX. To the species described on p. 522, Vol. II., the following should be added:

O. capitatum (headed). *l.* elliptic, acuminate, long-petiolate, persistent. *h.* 12ft. South America, 1779. A vigorous shrub. SYNS. *Aralia capitata*, *Hedera capitata.*

O. jatrophæfolium (Jatropha-leaved). *l.* palmate or sub-digitate; lobes ovate-lanceolate, sinuated on the margins; petioles cylindrical, 10in. to 12in. long. Stem cylindrical, branching only at the summit. Mexico. Greenhouse. SYN. *Aralia jatrophæfolia.*

O. nymphæifolia (Nymphæa-leaved). *fl.* inconspicuous, in a terminal panicle. *l.* of a beautiful green, long-petiolate, persistent, alternate, varying in length from 4in. to 12in., ovate, acuminate; nerves palmate, prominent beneath. Branches rounded. *h.* 6ft. to 12ft. A vigorous, greenhouse tree. SYN. *Aralia nymphæifolia* (of gardens).

O. Sanderianum (Sander's). *fl.* small, in globose heads. *l.* mostly three-lobed but variable in form, of a firm, coriaceous texture; mid-lobe usually prominent, triangular. Guatemala, 1892. In habit this species resembles *Fatsia papyrifera.* (G. C. 1893, xiii., f. 67; R. G. 1893, f. 71.)

O. xalapense. *Monopanax Ghiesbreghtii* is synonymous with this species.

OREOPHILA. A synonym of **Pachystima** (which *see*).

ORGYIA ANTIQUA. As stated in Vol. II., this is one of the worst pests against which gardeners have to contend. Not only does it destroy practically every kind of ornamental shrub and tree, but also fruit-bearing trees and bushes. *The* remedy, wherever it can be applied, is Paris Green diffused in a fine spray over the food-plants in spring. Much, however, may be done by way of prevention by searching for the cocoons in autumn and destroying those found, together with the adherent eggs, by burning.

ORIGANUM. To the species described on p. 523, Vol. II., the following variety should be added:

O. hybridum (hybrid). This plant is identical with *O. sipyleum.* (G. C 1888, iii., p. 232, f. 37.)

O. Maru nervosum (Maru, nerved). *fl.* pink; spikelets oblong, small, numerous. June. *l.* sessile, broadly ovate, almost entire, ¼in. to nearly 1in. long, somewhat cordate at base. Stem erect, 1ft. high. Egypt, &c., 1823.

O. Maru (of Sibthorp). A synonym of *O. microphyllum.*

Origanum—*continued.*

O. nervosum (nerved). A form of *O. Maru.*

O. pulchellum (rather pretty). A form of *O. Tournefortii.*

O. vulgare aureum.* A bright yellow variety of the type, flowering in early spring.

ORITHALIA. A synonym of **Agalmyla** (which *see*).

ORIXA. Included under **Celastrus** (which *see*).

ORMOCARPUM. The correct name of *O. coronilloides* is *O. sennoides. Diphaca cochinchinensis, Pictetia squamata,* and *Robinia squamata* are synonymous with this species.

ORNITHARIUM STRIATULUM. A synonym of **Sarcochilus teres** (which *see*).

ORNITHIDIUM. To the species described on p. 524, Vol. II., the following should be added:

O. album (white). A synonym of *Camaridium ochroleucum.*

O. fragrans (fragrant). This species is allied to *O. densum,* but has fewer and larger flowers, which are whitish, suffused with purple, and fragrant, and shorter leaves. Habitat not recorded, 1894.

O. nanum (dwarf). *fl.* yellowish, small, borne on scapes 1in. long. *l.* and pseudo-bulbs very small. West Indies, 1894.

O. ochraceum (yellowish). *fl.* very small; sepals and petals ochraceous, with a few mauve-purple spots, ligulate, acute; lip white, the disk of the anterior lacinia ochre, spotted mauve. *l.* cuneate-oblong, unequally acuminate, cartilaginous. Pseudo-bulbs elliptical, ancipitous. Colombia, 1837. Of poor appearance.

O. parviflorum and *O. Sophronitis* (R. X. O., t. 84, f. 3) are in cultivation in botanical establishments.

ORNITHOCEPHALUS. *O. Oberonia* has been introduced, but is probably not in general cultivation.

ORNITHOGALUM. To the species described on pp. 524-6, Vol. II., the following should be added. They need greenhouse treatment except where otherwise stated. *O. nutans* and *O. umbellatum* are exceedingly valuable, as, while thriving in dense shade, they are proof against the attacks of rats and mice.

O. albovirens (white and green). *fl.* in a dense, oblong raceme about 2in. long; perianth whitish, ¼in. to ⅓in. long, the segments keeled with green; peduncle 1ft. to 1½ft. long. *l.* three or four, linear, 1ft. to 1½ft. long, ⅓in. to ¾in. broad, acuminate, glabrous. Bulb green, 1in. in diameter. South Africa, before 1878.

O. anomalum. *Drimia anomala* is the correct name of this species.

O. apertiflorum (open-flowered). *fl.* greenish-white, ¾in. across, disposed in a spike 1½ft. long. *l.* slender, 6in. long. Orient, 1889. Allied to *O. narbonense.*

O. armeniacum (Armenian). *fl.* white, keeled with green, eight to twelve in a dense corymb; perianth ½in. to ¾in. long. *l.* numerous, very narrow, linear, channelled, 7in. to 10in. long, white-lined, ciliated below or on the margins. Bulb ovate. Armenia, 1879.

O. aurantiacum (orange-coloured). *fl.* one or two, bright orange-yellow; perianth ½in. long; peduncle slender, 3in. to 4in. long. *l.* two or three, very slender, terete, glabrous, shorter than the peduncle. Bulb ½in. in diameter. South Africa, 1878.

O. aureum (golden). A form of *O. thyrsoides.*

O. capitatum. *Urginea capitata* is the correct name of this species.

O. divaricatum (straggling). A synonym of *Chlorogalum pomeridianum.*

O. exscapum (dwarf-scaped). *fl.* white, three to twelve in a raceme 2½in. to 3in. broad; perianth ½in. to ¾in. long; scape 1in. to 1½in. long. May. *l.* five or six, 4in. to 6in. long, glabrous, striped. South Europe, 1824. Hardy.

O. flavescens (yellowish). A form of *O. thyrsoides.*

O. flavissimum (yellowest). A form of *O. thyrsoides.*

O. grandiflorum (large-flowered).* *fl.* white, large, each of the six perianth segments tinged with green at the base. Habitat not recorded, 1897. Hardy.

O. Hausknechtii (Hausknecht's). *fl.* pure white, large, appearing very early in the spring and growing only a few inches above the ground. Asia Minor, 1897.

O. narbonense pyramidale (pyramidal). A variety bearing pyramidal clusters of white flowers. *h.* 3ft. to 4ft. Hardy.

O. natalense (Natal). *fl.* white, small; pedicels ascending; raceme lax, 1½in. to 3in. long. *l.* three, sub-erect, thin, linear, 3in. to 4in. long, hairy, ciliated on the margins. Bulb small. South Africa (at 6300ft.), 1893.

O. Saundersiæ (Mrs. K. Saunders'). *fl.* white, many, corymbose; perianth ½in. long; pedicels 1½in. to 2in. long; peduncle stout, 2ft. to 3ft. long. *l.* many, lorate, flaccid, above 1ft. long, 2in. broad. Bulb large, globose. South Africa, 1891. Allied to *O. arabicum.*

O. Squilla (Squill). A synonym of *Urginea maritima.*

O. umbellatum splendens (splendid).* A large variety of the well-known type. Hardy.

OROBUS. To the species described on p. 527, Vol. II., the following should be added:

O. aurantius. The correct name is *Vicia aurantia.*

O. aureus (golden). *fl.* fawn or ochreous-yellow, rather large, in loose racemes. May and June. *l.*, leaflets ample, pale green. Stems branched. *h.* 1½ft. Tauria.

O. lathyroides (Lathyrus-like). A synonym of *Vicia oroboides.*

O. montanus (mountain-loving). A synonym of *O. luteus.*

O. pyrenaicus (Pyrenean). A synonym of *O. variegatus.*

O. vernus albusplenus (white, double).* A showy double variety.

ORONTIUM JAPONICUM. A synonym of **Rohdea japonica** (which *see*).

OROXYLON is the correct spelling of *Oroxylum.* SYN. *Calosanthus.*

ORPHANIDESIA (named in honour of Professor Theodoros G. Orphanides, a Greek botanist). ORD. *Ericaceæ.* A monotypic genus. The species is a dwarf, hardy, shrubby plant, allied to *Agauria* and *Gaultheria.* It will thrive in peaty soil, and may be increased by cuttings or by layers.

O. gaultherioides (Gaultheria-like). *fl.* one or two to a peduncle; calyx lobes large; corolla salver-shaped, ¼in. long. *l.* alternate, oblong, acute, 2in. to 3in. long, rough beneath; petioles short. Branches prostrate, leafy, covered with stiff hairs and glands, the leafy part 1ft. long. Caucasus, 1890. (R. G. 1891, p. 469, f. 87.)

ORTGIESIA (named in honour of M. Ed. Ortgies, for nearly forty years Curator of the Botanic Garden at Zurich). ORD. *Bromeliaceæ.* A small genus (two species) of half-hardy, herbaceous plants, natives of Uruguay and South Brazil. Flowers bright red; sepals lanceolate, gradually narrowed to a large cusp, united in a distinct cup above the apex of the ovary; petals lingulate; inflorescence a dense spike or head. Leaves and habit of *Rhodostachys.* Of the two species, *O. Legrelleana* is described on p. 30, Vol. I., as *Æchmea Ortgiesii,* and *O. tillandsioides* on p. 202, Vol. III., as *Portea tillandsioides* (their former names).

ORTHOCARPUS (from *orthos,* upright, and *karpos,* fruit: the capsule is not oblique, as in *Melampyrum,* an allied genus). SYN. *Oncorrhynchus.* ORD. *Scrophularineæ.* The correct name of the genus described on p. 92, Vol. IV., as **Triphysaria** (which *see*).

O. crianthus roseus (woolly-flowered, pink). The correct name of *Triphysaria versicolor.*

O. purpurascens (purplish). *fl.* 1in. long; calyx lobes, corolla, and the pinnatisect bracts crimson, pink, or purplish; spike thick and dense. Spring and summer. *l.* laciniately once or twice pinnately parted into very narrow lobes, or the upper ones palmately cleft. *h.* 6in. to 12in. California. Half-hardy. (R. G., t. 1166.)

ORTHOCERAS. *O. strictum* is the correct name of the plant described on p. 528, Vol. II., as *O. Solandri.*

ORTHOSANTHUS. *See* **Orthrosanthus.**

ORTHOSTEMON. A synonym of **Feijoa** (which *see*).

OSAGE APPLE. *See* **Maclura aurantiaca.**

OSBECKIA. *O. canescens* and *O. Umlaasiana* are synonyms of **Dissotis incana** (which *see*).

OSBECKIASTRUM. A synonym of **Dissotis** (which *see*).

OSMANTHUS. *O. rotundifolius* is a dwarf variety of *O. Aquifolium,* with very coriaceous, obovate, slightly lobed leaves. The various forms of *Osmanthus,* especially the green- and purple-leaved varieties, are serviceable for town gardens, also for growing in pots or tubs for the decoration of vestibules, balconies, &c. The variety named *atropurpurea* makes a splendid subject for winter bedding, especially when in association with the Golden-leaved Yew, the leaf-colour standing out in bold yet good contrast. They delight in good loamy soil and an open situation, yet one shielded from biting winds. Copious supplies of water should be given, particularly in the early part of the growing season. Propagation

Osmanthus—*continued.*

is readily carried on by means of cuttings taken off in autumn and dibbled in sandy soil on a shady border, and covered with hand-lights. Protection from the sun and frequent light waterings will be necessary for a few weeks. Plants may be quickly raised in February and March by grafting in heat on the common Oval-leaved Privet; but the latter are so objectionable in throwing up suckers that plants on their own roots are to be preferred.

OSMUNDA. Flowering Ferns. Osmundas are easily cultivated, even in common garden soil; but if planted out, a spot should be selected for them by the side of water, so that, while the heads of the plants are fully exposed to the air, the roots may be kept constantly wet. If anyone will take the trouble to prepare for these magnificent Ferns a mixture of swamp mud and good loam, and will keep their roots supplied with abundant moisture, the result will be all that can be desired. If, however, there is any difficulty in procuring the materials just named, a mixture of turfy loam and fibrous peat will suit them very well, and the addition of a portion of river-sand will induce the development of roots, which will run in all directions, and thus insure the production of numerous robust fronds. Though requiring an abundance of water at the roots at all times of the year, the plants dislike being syringed overhead. The propagation of Osmundas is invariably effected by means of spores, which are produced in abundance and germinate very freely. If grown in pots, the Royal Fern must have good drainage and an abundant and continuous supply of water.

To the species and varieties described on p. 530, Vol. II., the following should be added:

O. bipinnata (bipinnate).* *rhiz.* erect. *sti.* tufted, glossy, 1ft. or more in length. *fronds* bipinnate, 1½ft. to 2ft. long, 6in. to 10in. wide; pinnæ shining, coriaceous, 3ft. to 4ft. long, oblong-lanceolate, the upper ones barren and simple, the lower ones winged-stalked, with numerous oblong, closely-set, blunt, stalkless pinnules; fertile part consisting of three or four opposite pairs of pinnæ, with several pairs of pinnules ¼in. to ½in. long on each side; fertile segments much contracted, covered with fructification. Hong Kong A handsome, greenhouse species.

O. gracilis (slender). A form of *O. regalis.*

O. japonica (Japanese). A form of *O. regalis.*

O. regalis gracilis (slender).* A graceful form, the fronds of which sometimes come up tinted. SYN. *O. spectabilis.*

O. r. japonica (Japanese). *fronds*, barren and fertile ones often quite distinct, the latter developed first and soon disappearing; some of the lateral pinnæ becoming fertile, while the terminal ones remain barren. Another variety is *purpurascens.*

O. spectabilis (remarkable). A synonym of *O. regalis gracilis.*

OSSÆA. The correct name of *O. fascicularis* is *Henriettella fascicularis.* *O. hirsuta* is the proper name of **Sagræa hirsuta** (which *see*).

OSTEOCARPUS (from *osteon*, a bone, and *karpos*, fruit). ORD. *Convolvulaceæ.* A monotypic genus from Chili, only differing from *Nolana* in the very hard, bony fruit (whence the generic name). The species is a greenhouse herb or under-shrub. It thrives in sandy loam, and may be increased from seeds, or by cuttings of the young wood.

O. rostratus (beaked).* *fl.* azure-blue, bell-shaped, with pointed buds. Summer. *l.* scattered, linear, terete. Branches pubescent. A remarkably pretty sub-shrub. (R. G. 1884, t. 1175, a-e.) SYNS. *Alona rostrata, Nolana rostrata.*

OSTEOMELES (from *osteon*, bone, and *Melon*, an Apple; in allusion to the bony stones). ORD. *Rosaceæ.* A genus embracing eight species of hardy or half-hardy, evergreen, branched shrubs or trees, mostly natives of the Andes, but also represented in China, Birma, the Sandwich Islands, &c., and closely allied to **Amelanchier** (which *see* for culture). Flowers corymbose, few or numerous, bracteolate. Fruit slightly fleshy, with five hard stones. Leaves alternate, petiolate, coriaceous, usually simple (in one species impari-pinnate), nerved, entire or serrated. Only one species calls for mention here. *O. anthyllidifolia* is an elegant, half-hardy, evergreen shrub, thriving in any fairly good soil. It may be increased by seeds or by cuttings

Osteomeles—*continued.*

O. anthyllidifolia (Anthyllis-leaved).* *fl.* white, fragrant, Hawthorn-like, about ⅜in. across, in short, sub-sessile, terminal corymbs; petals obovate-oblong. Early summer. *fr.* dark red, globose, crowned by the calyx. February. *l.* 2in. to 4in. long, ¼in. to ½in. broad, impari-pinnate; leaflets in pairs, ⅛in. to ¼in. long. Branches stout. *h.* 5ft. to 6ft. Eastern Asia and the Pacific Islands, 1892. (B. M. 7354.)

OSTROWSKIA (named by Regel, in honour of the Russian botanist, Ostrowski). ORD. *Campanulaceæ.* A monotypic genus. The species is a very handsome and distinct, hardy, perennial herb, requiring a deep, light, rich soil to grow it successfully.

O. magnifica (magnificent).* *fl.* mauve-lilac, suffused with white, 5in. to 6in. across, on long stalks, disposed singly or in a terminal raceme; calyx with a series of linear pores at the base of the long, linear, acute segments; corolla campanulate, 3in. long and broad. *l.* in whorls, large, lanceolate, acutely toothed. *h.* 4ft. to 5ft. Turkestan, 1887. (B. M. 7472; G. C. 1888, iv., p. 65; I. H. 1889, 71; J. H. 1888, xvii., p. 53; R. G. 1887, p. 639; R. H. 1888, 344.) One of the finest of hardy perennials known.

OSTRYA. To the species described on p. 532, Vol. II., the following should be added:

O. Knowltii (Knowlt's). *l.* ovate, obtuse or acute at apex, obtuse or cuneiform at base, serrate-toothed, pubescent, smaller than those of *O. virginica.* *h.* 12ft. Arizona, 1863. (G. & F. 1894, i., f. 23.)

OTACANTHUS. This genus is now regarded as monotypic (*O. cæruleus*).

OTAHEITE APPLE. *See* **Spondias.**

OTHLIS. A synonym of **Doliocarpus** (which *see*).

OTHONNA. Including *Ceradia.* To the species described on pp. 532-3, Vol. II., the following should be added. One or two plants formerly included hereunder are now referred to **Euryops.**

O. amplexifolia (clasping-leaved). The correct name of *O. amplexicaulis.*

O. ciliata (ciliated). A synonym of *Othonnopsis ciliata.*

O. coronopifolia (Coronopus-leaved). *fl.-heads*, rays in many series; peduncles terminal, 3in. to 6in. long, one-headed. July to September. *l.* lanceolate or linear-lanceolate, entire or few-toothed, 1½in. to 2½in. long, acuminate, thick. Stem shrubby, erect. *h.* 1ft. to 2ft. 1787.

O. cylindrica (cylindrical). *fl.-heads*, involucral scales eight or nine; peduncles terminal, bearing a several-headed, branching corymb. *l.* scattered, long-linear, 1½in. to 3in. or more in length, semi-terete, spreading. 1818. A loosely-branched, forking shrub.

O. digitata (digitate). *fl.-heads*, florets many; involucral scales eight to ten, acute; peduncles 6in. to 8in. long, naked, one-headed. July to September. *l.* polymorphous; radical ones 4in. to 6in. long, generally more or less lobed or toothed; upper ones stem-clasping, oblong or spathulate. Stem short; branches sparsely leafy; root tuberous *h.* 1½ft. 1822. SYN. *Doria digitata.*

O. linifolia (Linum-leaved). *fl.-heads* solitary, terminal, on very long pedicels. June to September. *l.*, radical ones 6in. to 10in. long, long-linear or linear-lanceolate, rigid, ribbed and veiny. Stems scape-like, bifid, or twice or thrice forked, 8in. to 14in. high; root tuberous. 1824

O. quinquedentata (five-toothed). *fl.-heads*, pedicels elongated, sub-umbellate; involucral scales seven or eight. *l.* cuneate-oblong, 5in. to 6in. long, sessile, half-clasping and somewhat decurrent, thinnish but tough, five-toothed near the apex. Stem closely leafy below, loosely panicled at the summit, 3ft. to 4ft. high, robust, but not woody. 1830.

O. retrofracta (bent back). *fl.-heads*, involucre five-parted; pedicels one-headed, axillary, scarcely twice as long as the leaves. June to September. *l.* oblong-lanceolate, cuneate at base, with a large tooth or lobe in the middle on each side. Branches divaricate or bent back. *h.* 2ft. 1823. Plant half-shrubby, erect, glabrous. SYN. *Doria retrofracta.*

OTHONNOPSIS. To the species described on p. 533, Vol. II., the following should be added:

O. ciliata (ciliated). *fl.*-heads terminal, solitary, on naked peduncles 6in. to 8in. long; rays eight, long and broad. *l.* 1½in. to 2in. long, tapering much at base, oblong, obovate or spathulate, undivided or incised-pinnatifid with short, broad lobes, all ciliate-toothed. Stems many from the crown, trailing, several feet long. 1823. Sub-shrub. SYN. *Othonna ciliata.*

OTOCHILUS. *O. porrecta* is the correct name of the plant described on p. 534, Vol. II., as *O. fragrans.*

OTOPTERA BURCHELLII. A synonym of **Vigna Burchellii** (which *see*).

OTTELIA. *O. indica* is now regarded as a form of *O. ovalifolia.*

OUR LADY'S MILK THISTLE. *See* **Silybum Marianum.**

OVULARIA SYRINGÆ. *See* **Syringa—Fungi.**

OXALIS. To the species and varieties described on pp. 540-2, Vol. II., the following should be added:

O. anthelmintica (anthelmintic). A synonym of *O. Pes-capræ abyssinica.*

O. binervis (two-nerved). *fl.* white, three to seven in an umbel. *l.* consisting of three deeply-lobed leaflets; lobes lanceolate-oblong, somewhat falcate, two-nerved, dark purple beneath. Root tuberous. Habitat not recorded, 1890.

O. caprina abyssinica (goat's, Abyssinian). A synonym of *O. Pes-capræ abyssinica.*

O. catharinensis (Santa Catharina). *fl.* white, greenish at base; petals ¼in. to ⅜in. long, narrow cuneate-oblong; peduncles terete, umbellately four- to fifteen-flowered. *l.*, leaflets three, triangular, sub-sessile, 2½in. broad, cuneate at base, truncate at apex, green and glabrous above, paler or purplish and minutely hairy beneath; petioles 2in. to 8in. long. Rhizome branching, covered with fleshy scales. South Brazil, 1887.

O. corniculata. This species and its variety *rubra* are perennials.

O. corymbosa (corymbose). The correct name of *O. bipunctata* and *O. Martiana.*

O. imbricata flore-pleno (imbricated, double-flowered). *fl.* of a deep rose-colour, "as double as the most double of Chinese Primulas," nodding; peduncles hairy. *l.* hairy. Port Elizabeth, 1886. (C. C. 1887, ii., p. 681.)

O. Pes-capræ abyssinica (Abyssinian goat's-foot). *fl.* purple or lilac, about ½in. long, in umbels of three to eight on elongated, succulent peduncles. *l.* on petioles 2in. to 6in. long, with short, membranous sheaths; leaflets obcordate, with broad, rounded lobes. Stem very short (or wanting); tuber oblong-ovoid, covered with brown scales. Tropical and South Africa, 1893. SYNS. *O. anthelmintica, O. caprina abyssinica.*

O. sensitiva (sensitive). A synonym of *Biophytum sensitivum.*

O. stricta is now regarded as an American form of the British *O. corniculata.*

OXERA (from *oxeros*, sour; in allusion to the acrid taste). SYN. *Oncoma.* ORD. *Verbenaceæ.* A genus embracing ten species of glabrous, often climbing, stove shrubs, natives of New Caledonia. Flowers whitish or yellowish-white, pedicellate, rather large; calyx four- or five-cleft, or rarely sinuate-toothed; corolla limb four-cleft; perfect stamens two, long-exserted; bracts usually small; cymes dichotomous, pedunculate in the upper axils, or disposed in a terminal, trichotomous panicle. Leaves opposite, entire, coriaceous. Only one species has been introduced. It thrives in good, rich, loamy soil, and may be increased by cuttings.

O. pulchella (pretty).* *fl.*, calyx of four green sepals, ½in. to ⅝in. long; corolla yellowish or faintly greenish-white, 2in. long, between funnel- and bell-shaped, the lobes broadly oblong; cymes many-flowered. December. *l.* 2in. to 5in. long, petiolate; upper ones oblong, obtuse or sub-acute; lower ones longer, oblong-lanceolate, obtusely acuminate, entire or with shallow crenatures. 1886. A handsome, free-flowering, evergreen climber. (B. M. 6938; G. C. 1888, iii., p. 209; Gn. xxxiii., 510; J. H. 1888, xvi., p. 87.)

OXYACANTHA. *See* **Cratægus Oxyacantha.**

OXYBAPHUS. SYN. *Allionia* (of Loefler). To the species described on p. 542, Vol. II., the following should be added:

O. californicus (Californian). *fl.* purple, solitary, axillary, funnel-shaped, on pedicels about ½in. long. *l.* petiolate, broadly ovate, obtuse or sub-acute, sub-cordate at base. *h.* 1ft. to 2ft. California, 1888. Hardy perennial, viscid on the stem and leaves. (R. G., t. 1266, f. 2.)

O. nyctagineus (night-flowering). The correct name of *O. Cervantesii.*

OXYPETALUM. *Tweedia floribunda, T. pubescens,* and *T. rosea* are synonyms of *O. solanoides.*

OXYRAMPHIS, or **OXYRHAMPHIS.** Included under **Lespedeza** (which *see*), the correct name of *O. macrostyla* (of Lindley) being *L. eriocarpa.*

OXYTENANTHERA (from *oxytenes*, sharp-pointed, and *anthera*, an anther). ORD. *Gramineæ.* A genus embracing nine species of arborescent or scandent, unarmed Bamboos, with a stout, usually creeping, and stoloniferous rootstock; one is tropical African, and

Oxytenanthera—*continued.*

the rest are Asiatic. Spikelets elongated, cylindrical or conical, one- to three-flowered; panicle large, the branches with few or many heads of whorled or capitate spikelets. Leaves large or small, shortly petiolate. Stem-sheaths various. Only one species has been introduced. For culture, *see* **Bambusa.**

O. abyssinica (Abyssinian). *fl.*, spikelets oblong-conical, very acute, 1in. long, disposed in very numerous heads. *l.* linear- or oblong-lanceolate, 6in. to 10in. long, ½in. to 1in. broad, sub-cordate or narrowed at base; sheaths glabrous or hairy. Culm 25ft. to 50ft. high, woody, 1½in. to 3in. thick at base, glaucous-pruinose; branches whorled. Abyssinia, 1893.

OXYTROPIS. *O. uralensis* is the correct name of *O. Halleri.*

OXYURA CHRYSANTHEMOIDES. A synonym of **Layia Calliglossa** (which *see*).

OYSTER-SHELL BARK-LOUSE. *See* **Apple Mussel Scale,** Vol. V.

OZOPHYLLUM. A synonym of **Ticorea** (which *see*).

PACHISTIMA. The correct spelling of **Pachystima** (which *see*).

PACHYPODIUM. *P. tomentosum* is the correct name of *P. succulentum.* SYN. *P. tuberosum.*

PACHYRHIZUS. *P. Thunbergianus* is a synonym of *Pueraria Thunbergiana.*

PACHYSANDRA. *P. coriacea* is a form of *Sarcococca pruniformis.*

PACHYSTIMA. The correct spelling, according to the Kew authorities, is *Pachistima.*

PACHYSTOMA. *Ipsea* is kept distinct by the Kew authorities. To the species described on p. 2, Vol. III., the following should be added:

P. pubescens (downy). *fl.* white, having the trifid lip striated with purple and with a green disk; sepals lanceolate; petals linear-ligulate; raceme dense. *l.* ensiform, 3ft. long. Java.

P. Thomsonianum punctulatum. *fl.* principally differing from the type in having white sepals and petals, minutely pointed with red. 1898. (R. H. 1898, p. 504.) The correct name of *P. Thomsonianum,* according to the Kew authorities, is *Ancistrochilus Thomsonianus.*

PACKING. *Fruits.* Peaches and Nectarines must not be over-ripe, or they are sure to bruise in transit. They should be packed in boxes only deep enough to take one layer, and the bottom bedded with wood wool. Each fruit should be carefully wrapped in tissue-paper and surrounded with fine wood wool to prevent the fruits from touching or moving in transit. Any empty space must be filled with packing material, and the lid of the box screwed, not nailed, down.

PÆONIA. Herbaceous Pæonies, both Singles (Fig. 612) and Doubles (Fig. 613), are of such value to the gardener that no one can really afford to have them unrepresented. They are amongst the hardiest flowers that can be named, brilliant, even gorgeous, of colour, or yet again, of the most delicate shades, sweet of scent, and attractive as to foliage, the tints of the Pæony plants in spring and autumn being incomparably beautiful. How different the present-day varieties from the old ones which did duty in gardens thirty years ago, restricted as to colour, and the scent of which was positively repugnant! The best time to plant is early autumn.

Unfortunately it is not everywhere that these gorgeous Pæonies will flourish. They need a good, rich, well-trenched soil, and it is useless attempting their culture in a poor one. Position is of some importance with the Pæony, and some of the best specimens we have seen have been grown between the shelter of fruit trees or in the shrubbery borders. A south-west, west, or even a north-west aspect suits them best; an east or a south-east aspect is not good. The fact is, the Pæony forms its buds very early in the season, and though the plants are capable of enduring severe frosts with impunity, yet if the buds are frozen, and then the sun's rays fall directly upon them, they are spoilt for a certainty. Usually this is not noticeable until long after the damage is done. If more consideration were

Pæonia—*continued.*

given to planting, the complaints against the non-flowering of the Pæony would be fewer.

Disbudding one frequently sees advocated, but this is a waste, as the Pæony is all too soon out of blossom. During the growing season plenty of water is necessary, with liquid manure as a stimulant; while to prevent evaporation of moisture from the soil, a mulching of litter should be provided in spring. Well-decayed horse-manure will be found, as a rule, better than cow-manure, and less likely to encourage insects hurtful to the roots.

FIG. 612. SINGLE PÆONIES EMPIRE AND LADY HELEN VINCENT.

PESTS. Pæonies enjoy a singular immunity from diseases and animal pests. The worst pest is that described by Mr. Massee as the Drooping Disease of Pæonies (*Sclerotinia pæoniæ*) in the "Gardeners' Chronicle" of Aug. 13, 1898. The characteristic drooping of the stem, he says, appears without any previous warning, and the plants attacked succumb in a few days. At first a white mould forms upon the discoloured stems—this is the Botrytis-stage of the fungus; while later the sclerotia are developed; these tide the disease over the winter, and produce conidia the next season to renew the attack. Mr. Massee recommends the immediate removal of all affected stems, and the removal of the old surface soil, replacing it with fresh but mixed with lime.

To the species and varieties described on pp. 5-7, Vol. III., the following should be added:

P. anomala (anomalous). According to the "Index Kewensis," this is the correct name of *P. Emodi.*

P. arietina. Of this species there are several varieties, including *alba*, *Andersoni*, *Barrii*, and *Baxteri.*

P. Bakeri (Baker's). *fl.* deep rose, about 4½in. across. *l.* about six, biternately divided; leaflets broadly ovate, acute, the terminal one three-lobed, glaucous and hairy beneath. Stem stout, pilose, reddish. *h.* 2ft. 1890. (J. H. S. xii., p. 441, f. 32.) SYN. *P. peregrina byzantina.*

P. Broteri (Broter's). *fl.* crimson or rose-red, rarely white; petals six to eight, obovate, cuneate, 2in. long. *l.* six to eight to a stem, glabrous on both surfaces, bright green above, glaucescent beneath, the terminal segment 1in. to 1½in. broad; fully-developed lower leaves with about twenty segments. Stems glabrous, one-flowered. *h.* 1ft. to 2ft. Spain and Portugal. Excellent for naturalising.

P. decora. Of this there are two varieties: *elatior*, with larger and richer flowers than the type; and *Pallasii*, a deep crimson.

Pæonia—*continued.*

P. lutea (yellow).* *fl.* cupped, 3in. to 4in. across, somewhat resembling those of *Nuphar lutea.* *l.* like that of *P. Moutan.* Yunnan, 1900. An interesting species, for which gardeners are indebted to Prof. Max Cornu. With this Pæony-lovers may confidently look forward to a new colour-race of these beautiful flowers.

P. microcarpa (small-fruited).* *fl.* 4in. to 5in. across. *fr.*, carpels 1in. long. *l.* bipinnatipartite; divisions ternately pinnatisect, the lobes ovate or oblong-lanceolate, highly glabrous above, glaucous beneath. Spain. This is now regarded as a variety of *P. officinalis.*

The form JONATHAN GIBSON has very downy foliage.

P. officinalis. Additional varieties of this to note are: *albicans* and *anemonæflora**, rich crimson, with twisted stamens of a rich crimson and edged yellow.

P. paradoxa fimbriata (fimbriated). A variety with semi-double, lilac-purple flowers.

P. p. rosea (rosy). A rosy variety, somewhat difficult to procure.

P. peregrina byzantina (Byzantine). A synonym of *P. Bakeri.*

P. p. compacta (compact). A dwarf, bushy variety.

P. tenuifolia latifolia (broad-leaved).* An excellent variety, with broader foliage than the type. Late spring-flowering.

P. villosa (villous). This is a white-flowered European species sometimes met with in cultivation and in catalogues of hardy plants. It is, however, somewhat rare.

Varieties. The following are additional varieties to those already given:

Double Herbaceous Pæonies. AGNES BARR, AGNES MARY KELWAY, ALONZO, BARONESS SCHRODER, BERLIOZ, CAVALLERIA RUSTICANA, CYCLOPS, DR. BONAVIA, DUCHESS OF SUTHERLAND, DUCHESS OF TECK, DUKE OF CAMBRIDGE, DUKE OF CLARENCE, DUKE OF DEVONSHIRE, GLORY OF SOMERSET, JOAN SEATON, KELWAY'S QUEEN, LADY ALEXANDRA MACDUFF, LADY BERESFORD, LADY CARRINGTON, LADY GWENDOLEN CECIL, LADY LEONORA BRAMWELL, LANGPORT QUEEN, LIMOSEL, MADAME BREON, MADAME DE GALHAU, MADAME LOISE MERE, MARIA KELWAY, MASTERPIECE, MISS BRICE, MISS SALMON, MOONBEAM, MOUNTEBANK, MRS. STUBBS, PADEREWSKI, PRINCE GEORGE, PRINCE OF WALES, PRINCESS MAY, SAINFOIN, SIR THOMAS LIPTON, SNOWBALL, SOLFATERRE, SUMMER DAY (Fig. 613).

FIG. 613. DOUBLE PÆONY SUMMER DAY.

Single Herbaceous Pæonies. AMIABLE, ARGUS, AUTUMNUS, BRIDESMAID, DOROTHY, DUCHESS OF PORTLAND, DUCHESS OF SUTHERLAND, EMILY, EMPIRE (Fig. 612), HESPERUS, KAISER, LADY HELEN VINCENT (Fig. 612), LADY LILIAN OGLE, LADY MARGARET FERGUSON, LADY WIMBORNE, MARGARET ATTWOOD,

Pæonia—*continued.*

MILLAIS, OPHIA, QUEEN OF MAY, ROSY DAWN, STANLEY, THE CZAR, THE MIKADO, VISCOUNT CROSS, WATER LILY, WHITLEYI.

Hardy European Pæonies (varieties of *P. anomala*, *P. arietina*, *P. decora*, *P. officinalis*, and *P. peregrina*). BLANDA, BLUSHING MAID, CHARMER, CROWN PRINCE, ELATIOR, EXCELSIOR, EXQUISITE, GERTRUDE JEKYLL, INSIGNIS, NORTHERN GLORY, OTTO FROEBEL, PETER BARR, POMPADOUR, PURPLE EMPEROR, ROSY GEM, RUBY QUEEN, SABINI, SERAPH, SUNBEAM.

Moutan, or Tree-Pæonies (*Singles and Doubles*). BANIERI, BEAUTY, CECIL RHODES, COMTESSE D'ENDORT, DON QUIXOTE, ELLA C. STUBBS, FRAGRANS MAXIMA, GRAND DUKE, HENRY IRVING, JAMES KELWAY, JEAN DE RESZKE, LILACINA PLENISSIMA, LORD BYRON, LORD IVEAGH, LOUISE MICHELET, MADAME LAFFAY, MADAME LOUISE, MISS BEATRICE JONES, MR. BANCROFT, ODORATA MARIA, PRINCE ALBERT, REINE ELIZABETH, RUTILA, SNOWFLAKE.

PAINTED CUP. *See* **Castilleja.**

PAINTED GRASS. *See* **Arundo.**

PALA INDIGO-PLANT. *See* **Wrightia tinctoria.**

PALAFOXIA. *P. Hookeriana* and *P. texana* are now removed to the genus **Polypteris** (which *see*).

PALAUA is the correct spelling of *Palava.*

PALAY- or IVORY-TREE. *See* **Wrightia.**

PALEACEOUS. Chaffy; bearing chaff-like scales.

PALICOUREA. To the species described on p. 8, Vol. III., the following should be added:

P. barbinerva (bearded-nerved). The correct name of *P. lutea.*

P. discolor (two-coloured). A garden synonym of *Psychotria tabacifolia.*

P. jugosa (ridged). *l.* opposite, elliptic-oblong, dark, satiny green, with depressed midrib and veins, the under-surface purple. Brazil, 1886.

P. nicotianæfolia (Nicotiana-leaved). A synonym of *Psychotria tabacifolia.*

P. racemosa is now classed under *Psychotria.*

P. subcrocea (somewhat Saffron-coloured). The correct name of *P. crocea.*

PALINETES. A synonym of **Ammocharis** (which *see*).

PALISOTA. To the species described on p. 8, Vol. III., the following should be added:

P. Maclaudii (Maclaud's). *fl.* white; panicle cylindrical, lax, 8in. long; peduncle 2in. to 4in. long, woolly. *l.* long and rather narrow; hairs of the sheaths and stalks black. Upper Guinea, 1896.

PALIURUS. *P. Spina-Christi* is the correct name of *P. aculeatus* (SYNS. *P. australis*, *P. virgatus*, B. M. 2535); *P. ramosissimus* is the correct name of *P. Aubletia.*

PALLASIA (of L'Héritier). A synonym of **Encelia** (which *see*).

PALLENIS. This genus now embraces four species, of which *P. spinosa* is the best known.

PALM, CABBAGE. *See* **Oreodoxa oleracea.**

PALM OIL. This is yielded by **Elæis guianensis** (which *see*).

PALMS. The general culture and propagation of these are discussed under **Palmæ,** in Vol. III., pp. 12 and 13.

PANAX. According to the Kew authorities, *P. dumosum*, *P. fissum*, *P. laciniatum*, *P. plumatum*, and *P. Victoriæ* are merely forms of *P. fruticosum.* To the species, &c., described on p. 14, Vol. III., the following should be added (probably most of these are varieties of *P. fruticosum*). All are stove shrubs.

P. armatum. The correct name is *Aralia armata.*

P. aureum (golden). This resembles *P.* (*fruticosum*) *Victoriæ*, but the variegation is yellow instead of white. West Indies, 1899.

P. Balfourii (Balfour's).* *l.*, leaflets orbicular, serrated, green, blotched and margined with creamy-white. New Caledonia, 1899. An elegant plant.

P. crispatum (crisped). *l.* densely disposed, triangular, pinnately divided, deep green, with several pairs of overlapping leaflets and a terminal one, each of which is deeply incised and slightly toothed on the margins, thus imparting a crispy appearance; petioles (and stem) olive-green, spotted lighter green. Brazil, 1888.

Panax—*continued.*

P. fruticosum multifidum (much-cleft). *l.* broadly ovate and very obtuse in outline, tripinnatisect; ultimate divisions linear or linear-lanceolate, ¼in. to ½in. long, tipped with a short, white bristle, and often margined with bristle-tipped teeth. 1837.

P. f. Victoriæ (Queen Victoria's).* A variety showing white variegation.

P. horridum (horrid). A synonym of *Fatsia horrida.*

P. lepidum (pretty). *l.* biternate, deep green, the leading division surpassing the others; lateral pinnules of the secondary divisions obliquely obovate, the inner portions of the two blades almost covering the small central pinnule, which is deflexed, and in some instances is scarcely more than rudimentary; outside margins deeply and irregularly incised, spinose-toothed. Brazil, 1888.

P. Mastersianum (Dr. Masters').* *fl.*, green, minute, in small umbels at the termination of each branchlet of the inflorescence. *l.* elegant, pinnate, 3ft. long; leaflets pale green, flushed with pink, 10in. long; rachis forked; petioles pinkish, spotted with white. Stem erect. Solomon Islands, 1893. (G. C. 1893, xxiii., p. 242, f. 33.)

P. nitidum (shining). *l.* deep green, roundish-obovate, appressed at apex, the margins furnished with small, slightly spinose teeth, the front part with two, three, or more deep incisions; petioles and stems brownish or deep olive-green, spotted or marbled yellowish-green. Brazil, 1888.

P. ornatum (adorned). *l.* long, pinnate; pinnæ narrow-lanceolate, deeply toothed on the margins; petioles (and stems) dark brownish-green, freckled or spotted light green. Brazil, 1888.

P. serratifolium (serrate-leaved). *l.* compound; leaflets serrated at the edge; petioles (and stem) marked with brown. Polynesia, 1883.

P. spinosum (spiny). A synonym of *Acanthopanax spinosum* (*Aralia pentaphylla*).

PANCHLORA MADERÆ. *See* **Cockroaches.**

PANCIATICA. A synonym of **Cadia** (which *see*).

PANCRATIUM. To the information given on pp. 14-15, Vol. III., the following should now be added. Several plants formerly classed under this genus are now referred to **Hymenocallis** (which *see*).

P. amboinense and **P. australasica** are synonyms of *Eurycles sylvestris.*

P. fragrans (fragrant). A synonym of *Hymenocallis ovata.*

P. guianense (Guiana). A synonym of *Hymenocallis tubiflora.*

P. parviflorum (small-flowered). A synonym of *Vagaria parviflora.*

P. trianthum (three-flowered). *fl.* one to three in an umbel; perianth tube 6in. long, obconical in the upper inch; segments lanceolate, acute, ascending, 2in. long; staminal cup about 1in. long, with bifid teeth between the free tips of the filaments; peduncle short, slender. Spring and summer. *l.* six to eight, narrow-linear, 1ft. or more in length, straight. Bulb 1in. to 2in. in diameter. Tropical Africa, 1894.

PANDANOPHYLLUM. Included under **Mapania** (which *see*).

PANDANUS. Including *Barrotia* and *Eydouxia.* To the species described on pp. 16-18, Vol. III., the following should be added:

P. aquaticus (aquatic). This differs from *P. odoratissimus* in the stem emitting no adventitious descending roots, and in the drupes in the head not cohering in clusters. North Australia.

P. Augustianus (Auguste's). This is closely related to *P. Kerchovei*, but the leaves are larger and more densely serrated, the nerves being green and denticulated, and the stem is broader. Papua, 1886. (I. H. 1886, t. 612.)

P. Baptistii (Baptist's). This species is described as being "remarkable for its narrow, bright green leaves, entirely devoid of spines." Australia, 1892. (R. G. 1893, f. 118.) SYNS. *P. Dyerianus*, *P. inermis Dyerianus.*

P. Barklyi (Barkly's). *fr.*, female heads containing seventy to 100 drupes; drupes purple, compressed, 1½in. to 2in. long. *l.* 1ft. to 3ft. long, ¾in. to 2in. broad, long-pointed, reduplicate on each side, dark green above, glabrescent beneath, the margins and midrib spiny. *h.* 5ft. to 8ft. Mauritius.

P. ceramicus (Island of Ceram). A synonym of *P. labyrinthicus.*

P. ceylanicus. *See* **P. zeylanicus.**

P. decorus is now regarded as distinct from *P. conoideus.*

P. discolor (two-coloured). *l.* serrated, having two slightly raised ridges on the upper surface; young ones of a bronzy hue. India, 1834. A bold-looking plant.

P. Dyerianus (Dyer's). A synonym of *P. Baptistii.*

P. Eydouxia (Eydouxia). *fr.*, female heads globose, containing twenty to thirty drupes; drupes 3in. to 5in. long, five- or six-

Pandanus—*continued.*

angled, orange-yellow at base. *l.* very firm, long-pointed, glaucous-green, 5ft. to 7ft. long, 3in. to 5in. broad, reduplicate on each side, the margins armed with red-tipped spines. Stem 8in. to 9in. in diameter. *h.* 20ft. Mauritius. SYN. *Eydouxia macrocarpa.*

P. Forsteri (Forster's). This only differs from *P. odoratissimus* in slight botanical characters. The whole head of fruit is said to be nearly 1ft. long, and the individual drupes are about 2in. long. New South Wales.

P. Grusonianus (Gruson's). *l.* numerous, very narrowly linear-lanceolate, densely serrated from base to apex, the teeth brilliant red, acute, the midrib keeled below and slenderly spicate. Stem short. Amirantes Islands, 1837. (I. H. xxxiv., t. 12.) SYN. *Barrotia Grusoniana.*

P. Horneï. *fr.*, female heads globose, 1ft. in diameter, containing eighty to 100 purple drupes 3in. to 5in. long. *l.* thin, coriaceous, 6ft. to 10ft. long, 3in. broad, tapering to a long point, dark green above, the midrib and edges armed with red spines. *h.* sometimes 60ft. Seychelles.

P. humilis (dwarf), of Loureiro. A synonym of *P. polycephalus.*

P. inermis (unarmed). *l.* 4½ft. long, 2in. broad, carinate, very acuminate, glaucous-green, very elegantly arched. *h.* 6ft. Philippine Islands.

P. i. Dyerianus (Dyer's). A synonym of *P. Baptistii.*

FIG. 614. PANDANUS SANDERI.

P. Kerchovei (Comte de Kerchove's). *l.* very narrow, attenuated and acute at apex, densely toothed, the middle nerve keeled below, the lateral ones numerous, one or two of the primary ones keeled above, confluent towards the apex; teeth greyish-white. Stem short, attenuated. Amirantes Islands, 1886. (I. H. 1886, t. 600.)

P. Kurzeanus (Kurze's). A synonym of *P. polycephalus.*

P. labyrinthicus (labyrinthine).* *fr.* scarlet when ripe, ellipsoid, 2½in. long, 1¾in. thick, fascicled at the tip of a long peduncle. *l.* linear, about 3ft. long, 1½in. broad, spiny on the margins and on the apex of the keel. Stem 1½in. thick, bearing a crown of leaves. Sumatra, 1888. (B. M. 7053.) SYN. *P. ceramicus* (also spelt *ceramensis*).

P. Lais is now regarded as a distinct species. *fr.* solitary or racemose, with a flat or depressed crown. Habit as *P. furcatus.* Malaya.

P. microcarpus (small-fruited). *fr.* globose, 2½in. in diameter, containing fifty to ninety very small, purple drupes. *l.* thin, coriaceous, 1ft. to 2ft. long, seven to ten lines broad, slightly glaucous beneath; margins red-spiny; midrib spiny at tip and base. Stem branching freely at an acute angle. Mauritius. A small tree or shrub.

P. nitidus (shining). A synonym of *P. stenophyllus.*

P. ornatus (ornate). *fr.* solitary, terminal, long-pedunculate, cylindric, glaucous, surrounded by short, scale-like spathes; drupes densely crowded but not confluent in groups. *l.* very long, caudate-acuminate, acutely serrated. Malacca and Singapore.

P. pacificus (Pacific).* *l.* broad, shining green, having the margins furnished with fine spines, and the tips narrowed

Pandanus—*continued.*

abruptly to a long, tail-like point. Pacific Islands, 1892. A distinct plant.

P. Porteanus is now regarded as specifically distinct from *P. polycephalus.*

P. Sanderi (Sander's).* *l.* sword-like, having small marginal spines something like *P. Veitchii*, but the variegation consists of narrow bands of golden-yellow, alternated with green throughout the length of the leaves, and not confined to the margins. Habitat not recorded, 1898. Habit tufted. See Fig. 614. (G. C. 1898, xxiii., p. 243, f. 94.)

P. sphæroideus (almost spherical). *fr.*, female heads 4½in. in diameter, globose, containing over 100 drupes, which are pink at base and bluish-green at apex. *l.* firm, 3ft. to 5ft. long, 2in. to 3¼in. broad, pale green, the edges armed with short, reddish spines. Stem decumbent, freely branched. *h.* 8ft. to 12ft. Mauritius.

P. stenophyllus (narrow-leaved). *l.* linear, flexuous, 1½ft. long, less than 1in. broad, spiny on the margins and midrib. Java. A very elegant plant. SYN. *P. nitidus.*

P. sylvestris (sylvan). *fr.* conical, 14in. to 18in. long; drupes orange, hexagonal. *l.* 6ft. to 9ft. long, 2in. broad, spiny on the borders and keel. Mascarene Islands. A branched tree, producing aerial roots. A specimen flowered in Paris in 1843-4.

P. Thurstoni (Thurston's). This species is closely related to *P. furcatus*, but differs in having a branched inflorescence. Fiji Islands, 1894.

P. unguifer (claw-bearing). A synonym of *P. minor.*

P. utilis exilis (meagre). A synonym of *P. Vandermeeschii.*

P. zeylanicus (Cingalese). *fr.* broadly oblong; crown conical, narrowed to a spinescent style notched at tip. *l.* elongated, the margins furnished with strong, recurved spines. Stems tall, tufted, very slender. Ceylon. Habit much as *P. furcatus*, but leaves narrower and branches more erect.

P. lævis, *P. Millore*, and *P. spectabilis* are also grown in botanic gardens, &c., but are not in general cultivation.

PANICULATE. Panicle-like; arranged in, or bearing panicles.

PANICUM. Including *Digitaria* and *Tricholæna.* To the species described on pp. 18-19, Vol. III., the following should be added:

P. bulbosum (bulbous).* *fl.* spreading gracefully; spikelets twin, quadrifariously imbricated, ovate, acute; panicle branched, about 5ft. high, the branches scabrous, alternate or opposite. *l.* pilose above, with scabrous margins. Culm glabrous. Mexico. A fine hardy perennial for the shrubbery border.

P. Crus-galli frumentaceum (Cockspur, forage). *fl.*, spikes many, thickened, incurved, sometimes corymbose, with densely crowded, unarmed spikelets. *l.* linear, flat, glabrous or puberulous. Stem erect. *h.* 1ft. to 4ft. All warm countries. Hardy annual.

P. frumentaceum (forage). A variety of *P. Crus-galli.*

P. italicum japonicum (Japanese). A form of the common Millet, with pendulous inflorescences, cultivated in Turkestan. It is probably native throughout Eastern and Southern Asia. *h.* 1½ft. (R. G. 1887, p. 278, f. 72.) *P. italicum* is now classed under *Setaria.*

P. jumentorum (cattle-food). A synonym of *P. maximum.*

P. tonsum (shorn). This is described as a hardy perennial, with a light, feathery, silky inflorescence 2ft. to 3ft. in height, and linear, acuminate, scabrid, glaucescent leaves. South Africa, 1895. (R. H. 1897, p. 273, f. 98.) SYN. *Tricholæna tonsa.*

PANISEA UNIFLORA. A synonym of **Cœlogyne uniflora** (which *see*).

PANNING. The making of a pan, or basin, round the stem of a newly-planted tree or shrub, in which water can be put to keep the roots moist, is sometimes termed "Panning."

PANSY. This has always been a favourite, not only on account of the rich, brilliant, and varied colours, beautifully contrasted with the softer shades, pale blue and violet, but also for the sweet and very delicate perfume. Again, plants may be obtained in blossom during every month in the year without forcing, but with the aid

Pansy—*continued.*

of a garden frame during the time of frost and snow. No plant sooner exhausts itself by blossoming; and as soon as the flowers show evident signs of inferiority, the old plants must be renovated by a rich surface-dressing, and a succession of young ones must be maintained. The recently-introduced varieties are all worthy of careful culture. A few of the best are here given:

FIG. 615. TYPE OF FANCY PANSY.

Fancy Pansies (see Fig. 615).

AGNES MABEL, ALEXANDER SMITH, ANDREW FRATER, ANDREW STRUTHERS, BERNARD DOULTON, C. B. RENSHAW, CLEOPATRA, COL. M. R. G. BUCHANAN, CONSTANCE SHELL, DAVID G. M'KAY, EMMELINE, GEORGE STUART, JEANIE R. KERR, JOHN M'LELLAN, JOHN ROBERTSON, LADAS, MARMION, MRS. C. LAMBIE, MRS. D. JOHNSTONE, MRS. J. DICKINSON EATON, MRS. R. G. MOIR, MRS. SHERRARD, MRS. WM. CUTHBERTSON, MRS. WILLIAM LOCKWOOD, MRS. W. STEELE, MRS. W. WATSON, MYSIE PAUL, PETUNIA, SIR JOHN WATSON, STEPHANIE, TAMWORTH HERALD, TAMWORTH YELLOW, TOM WALTERS, W. H. CLARKE, W. J. PYE, WILLIAM SYDENHAM, W. WATSON.

Show Pansies.

Class I. Selfs. ALEXANDER BLACK, ALLAN STEWART, BESSIE SMELLIE, BOBBY HARPER, JOHN E. MARTIN, LILYBANK GEM, MAGGIE BENSON, MARY MITCHELL, MISS ALLAN, MRS. GLADSTONE, MRS. JOHN HUNTER, WILLIAM FULTON, WINNIE IRVINE.

Class II. White Grounds. AGNES BORROWMAN, AGNES KAY, CATHERINA, FAIR MAID, GRACE DARLING, JESSIE THOMSON, MRS. BROWN, MRS. J. G. PAUL, MRS. W. GOODALL, MRS. WILSON, PORTIA, R. GARDINER, ROYAL VISIT, W. E. GLADSTONE.

Class III. Yellow Grounds. A. JOHNSTONE, BUSBY BEAUTY, BUSBY GEM, COLONEL STIRLING, D. STRACHAN, G. C. GORDON, JAMES CHRISTIE, JOHN BORROWMAN, NEIL TURNER, P. C. D. BOSWELL, REV. R. STEVENSON, ROBT. M. WENLEY.

PANSY RUST (*Peronospora violæ*). *See* **Violet Fungi.**

PANZERA. A synonym of **Eperua** (which *see*).

PAPAVER. To the species and varieties described on pp. 20-2, Vol. III., the following should be added:

P. aculeatum (prickly). The correct name of *P. horridum.*

P. arenarium (sand-loving). *fl.* purple, dark-spotted, as large as those of *P. Rhœas.* Early summer. *l.* bipinnatisect; segments linear, minute. Stems leafy, slightly branched. *h.* 1ft. to 1½ft. Orient. Annual.

P. californicum (Californian). *fl.* clear orange with a yellow centre, 2in. to 2½in. in diameter. *h.* 1ft. California, 1890.

P. cambricum (Welsh). A synonym of *Meconopsis cambrica.*

P. croceum (golden). A form of *P. nudicaule.*

Papaver—*continued.*

P. Danebrogii (Danebrog's). *See* under **P. somniferum.**

P. glaucum (glaucous).* *fl.* deep scarlet, solitary, 3in. to 4in. in diameter, remarkable in having the petals, which are spotted at base, arranged in the form of a double cup. May to July. *l.* glaucous; radical ones obovate-oblong, narrowed to the petioles; cauline ones pinnately lobed or parted, toothed, cordate at base. Armenia, &c., 1891. Annual. (R. G. 1891, p. 608, f. 116-7.)

P. Hookeri. SYN. *P. Rhœas latifolium.*

P. lævigatum (smooth).* *fl.* dark scarlet, with a black blotch at the base of each petal, 3in. to 4in. in diameter. Summer. *l.* pinnatipartite. Stems much-branched, 1ft. to 2ft. high. Orient, 1889. A handsome annual. (G. C. 1889, v., p. 20, f. 4.)

P. nudicaule. From this species have been produced the orange, white, and yellow forms known as Iceland Poppies. These are generally grown as biennials, sowing the seed in late summer to produce flowering plants the next season from late spring to early autumn.

P. n. radicatum (rooting). A dwarf variety, with very hairy leaves. 1899.

P. pavoninum. The correct spelling of *P. pavonium.*

P. Pollaki (Pollak's). This species is something in the way of *P. orientale*, but has smaller dark cherry-red flowers and more finely-cut leaves. Persia, 1888. Perennial.

P. pyrenaicum (Pyrenean). A form of *P. alpinum.*

P. radicatum (rooting). A form of *P. nudicaule.*

FIG. 616. FLOWERS OF PAPAVER SOMNIFERUM.

P. Rhœas. From this, the Common Wild Poppy of the fields, the world-wide Shirley Poppies have been produced by the Rev. W. Wilks, Vicar of Shirley. He first noticed a stranger in the midst of a patch of Wild Poppies in a waste corner of the garden, and by a process of selection and cross-fertilisation produced from a single flower having a narrow white edging to the petals the charming colours that we have to-day. Shirley Poppies are single, and are distinguished by having a white base with yellow or white anthers or pollen. They vary in colour from brightest scarlet to pure white, with intermediate shades of pink, together with flakes and edged flowers in variety

P. R. latifolium (broad-leaved). A synonym of *P. Hookeri.*

Papaver—*continued.*

P. rupifragum (rock-breaking). *fl.* orange-buff, 3in. across, on long peduncles; sepals glaucescent. Summer. *l.* nearly all radical, oblong-lanceolate, acute, pinnatipartite. Rhizomes tufted, many-stemmed. Spain and Marocco. Perennial.

P. r. atlanticum (Atlantic).* *fl.* orange-red or scarlet, 2in. to 3in. in diameter. *l.* 6in. to 8in. long, oblanceolate, pinnate. Stems hairy, 1ft. to 2ft. high. Marocco, 1890. A showy Poppy. (B. M. 7107.)

P. ruporient. A hybrid between the two species indicated by the name.

P. setigerum is classed by botanists as a form of *P. somniferum* (Fig. 616).

P. spicatum (spicate). *fl.* brick-red, disposed in a long, spike-like raceme, the lower ones very shortly pedicellate, the rest sessile. Summer. *l.* oblong; radical ones narrowed to the petioles; cauline ones rounded at base, sessile, acutely toothed. Orient. A densely white-woolly perennial.

P. umbrosum (shade-loving).* A variety of *P. Rhœas.*

Varieties. Of *P. orientale* and *P. o. bracteatum* there are some pretty garden forms, the best of which are: Beauty of Livermore, Brightness, Brilliant, Duke of York, Fire King, Pink Beauty, Præcox, Prince of Orange, Princess of Wales, Royal Scarlet, Salmon Queen, Silver Queen, Superbum, and Trilby. All are excellent for shrubberies, clumps in grass, and for the wild garden.

PAPAW of the United States. *See* **Asimina triloba.**

PAPPERITZIA (so called after Papperitz, a friend of Reichenbach's, who discovered *Hymenophyllum tunbridgense* in Saxony). ORD. *Orchideæ.* A monotypic genus. The species is a small, stove Orchid, of botanical interest, allied to *Rodriguezia.* For culture, *see* **Burlingtonia.**

P. Leiboldi (Leibold's). *fl.* green, small, with yellow bristles on the sepals and petals and some yellow on the lip; dorsal sepal conic-gibberose, with a tail-like apex, the lateral ones connate; petals oblong, aristate-acuminate; lip connate with the base of the column, forming a blunt pouch at the base, closed by a high, three-toothed crest; racemes lax, pendulous. July. *l.* 2in. to 3in. long, linear, acuminate. Mexico, 1886.

PARA CRESS. *See* **Spilanthes Acmella** (SYN. *S. oleracea*).

PARA NUT. *See* **Bertholletia.**

PARA RUBBER. *See* **Hevea brasiliensis.**

PARACARYUM. To the species described on p. 23, Vol. III., the following should be added:

P. angustifolium (narrow-leaved).* *fl.* sky-blue; corolla more than twice as long as the calyx; racemes corymbose. *l.* hairy; radical ones crowded, linear and linear-oblong; cauline ones few, narrow-linear. Asia Minor, 1899. An elegant, small, tufted perennial.

P. heliocarpum (sun-fruit). The correct name of *P. anchusoides.* (B. M. 7520.)

PARAFFIN. An excellent insecticide when carefully used. It is, however, difficult to mix with water. The best way of using Paraffin is in the form known as Kerosene Emulsion. *See* **Insecticides.**

PARAGUAY TEA. *See* **Ilex conocarpa.**

PARASITIC PLANTS. These are both numerous and varied as to form. They may consist of highly-organised subjects like Orchids, Mistletoes, Loranthi, &c.; of Ferns, Mosses, Lichens, Algæ, and a host of Fungi of large size as well as others of microscopic proportions.

PARDANTHUS. *P. nepalensis* and *P. japonicus* are garden varieties.

PARDIA TRIPUNCTANA. *See* **Rosa—Insects.**

PARING AND BURNING. Operations not very much practised now, as it is well known that they destroy all the humus and most of the plant-food in the soil, thus leaving it poorer than it was before. At the same time the addition of burnt soil in moderation often improves land by acting mechanically upon it, making it more porous and easier to work. When it is desired to utilise Parings from road-sides, ditches, or other soil infested with noxious weeds, it is an excellent plan to first burn the same, and so destroy all the objectionable matter before applying the new soil to the land.

PARIS DAISY. *See* **Chrysanthemum frutescens.**

PARIS GREEN. *See* **Insecticides.**

PARIVOA. Included under **Eperua** (which *see*).

PARLATORIA. A genus of Scale Insects, members of which are found in greenhouses in this country. The best known species are *P. pergandii*, found upon Asters; *P. Zizyphi*, very familiar upon imported Oranges; and *P. proteus* upon Orchids. *See* **Scale Insects.**

PARRYA. *P. macrocarpa* (R. G., t. 1126) is the correct name of *P. nudicaulis*, and *P. Linnæana* is the correct name of *P. arabidiflora.*

PARTED. Divided nearly to the base.

PARTING. The Parting, or division, of many plants becomes a necessity when they are so congested that the growth is weak and the blossoms are unsatisfactory. Many herbaceous plants need Parting every two or three years to prevent overcrowding and ensure the best results, and the same applies to a number of stove and greenhouse plants. As a rule, the best time to part plants is when they commence to make growth, as then new roots are being formed, and the divided portions quickly seize upon the soil and make rapid progress. There are exceptions to the rule of the time of Parting, such, for instance, as in the case of *Iris germanica.* These are always most successfully divided immediately after they have flowered. Pæonies, again, recover quickest if parted in September. *See also* **Propagation,** Vol. III.

PARTRIDGE WOOD. *See* **Oak Fungi,** Vol. V.

PASITHEA (named after Pasithea, one of the Graces, who was also called Aglaia). ORD. *Liliaceæ.* A monotypic genus. The species is a greenhouse, rhizomatous perennial, requiring similar culture to **Funkia** when grown under glass.

P. cærulea (blue). *fl.* pale purplish-blue, with darker stripes, star-shaped, 1in. in diameter, shortly and slenderly pedicellate; panicle erect, loosely racemose. April. *l.* narrow-linear, Grass-like, long-acuminate, sheathing at base. Chili, re-introduced 1889. Plant highly glabrous. (B. M. 7249.)

PASSERINA. Several species formerly known by this name are now classed under **Arthrosolen** and **Thymelæa** (which *see*).

PASSIFLORA. To the species and varieties described on pp. 29-33, Vol. III., the following should be added:

P. adiantifolia is now regarded as a species and not as a variety of *P. Banksii.*

P. Buonapartea. A hybrid between *P. alata* and *P. quadrangularis.*

P. Campbellii (Campbell's). *fl.* bright red, with purple shadings on the inner side of petals, the outer side paler red and minus the purple tinge; corona prominent, the centre being whitish, merging into red towards the extremities of the filaments. *l.* deeply five-lobed. A greenhouse variety of very vigorous growth.

P. cardinalis (scarlet). *fl.* small, about the size of *P. kermisina*; colour of petals brick-red inside, pale green outside; corona deeply set and pale in colour. *l.* entire. The "Kew Hand-List" refers this to *P. amabilis*, and the latter is given as a native of Brazil. Burbidge's "Cultivated Plants," however, says that it is a hybrid obtained by M. Schachter, of Loos-lès, Lille, the result of fertilising *P. racemosa* with pollen of *P. alata*, which seems to be copied from Dr. Masters' "Classified List of Passifloras," Jour. Royal Hort. Soc., iv., 125.

P. chelidonea (Swallow-wort-like). *fl.* greenish, 2in. in diameter. *l.* oblong, bifid to a quarter of their length, with a short middle tooth, shining green above, pubescent and pale purplish beneath, rounded at base. Ecuador, 1879. (G. C. 1879, xii., p. 40, f. 5.)

P. europhylla (broad-leaved). *fl.* whitish and unattractive. *l.* very broad, oblong, rounded at the base, with two large glands and two divergent triangular lobes at the apex, dull green on the upper and purplish on the under surface. British Guiana, 1900.

P. galbana (bright). *fl.* pale greenish or primrose-yellow, opening at dusk, closing in sunlight, 3in. across, fragrant; sepals having a small horn below the apex. *l.* entire, lanceolate, 3in. long, cordate-oblong-lanceolate; petioles less than ½in. long. Branches slender. Brazil, 1896. Greenhouse. (G. C. 1896, xx., p. 555, f. 97.)

P. Im-Thurnii (Im Thurn's). *fl.* erect, 4in. in diameter; sepals bright scarlet, oblong, glandular; petals rose-coloured or almost white, smaller than the sepals. *l.* broadly oblong, acute, leathery, glabrous above, setulose on the lower surface. Guiana, 1898. (G. C. 1898, xxiii., p. 305, f. 114.)

Passiflora—*continued.*

P. Jenmanii (Jenman's). *fl.* small, creamy-white. *l.* very distinct from any other Passiflora, and consisting of leaves with seven somewhat ovate leaflets, often with ciliated bristles near the base, and each leaflet has a distinct short petiole. Not a vigorous grower, and requires more care in cultivation.

P. kewensis (Kew). A garden hybrid between *P. Raddiana* and *P. cærulea*. 1888. Greenhouse.

P. Madonna. Said to be a cross between *P. racemosa* and *P. Buonapartea*.

P. manicata (collared). A synonym of *Tacsonia manicata*.

P. Marryattæ (Mrs. Marryatt's). *fl.*, petals purplish-red, the margins being of a deeper shade, outside reddish; corona full, filling the centre of blossom, and of a deeper shade of colour than the petals. *l.* thick, three-lobed. A free-growing, greenhouse variety, but less rampant than *P. Campbellii*. One of the very best, very free-flowering, often abundantly produced from the old growths or stems, which is unusual with most sorts.

P. Miersii (Miers'). *fl.* white, flushed with pink, about 2in. in diameter; outer coronal threads white, barred with purple at base, the inner ones violet or deep purple. *l.* ovate-lanceolate, entire, cordate at base, claret-coloured beneath. Brazil, 1838. A small species. (B. M. 7115; G. C. 1888, iv., p. 352, f. 46.)

P. Neumannii (Neumann's). *fl.*, sepals greenish-white, long, lanceolate; petals greenish-white, smaller; rays of the crown cærulean-blue, spreading. August. *l.* three-lobed; lobes slightly serrated, the middle one broadest and largest. Stem climbing. 1848. Hybrid. (P. M. B. 1849, xv., p. 270.)

P. peltata is a variety of *P. suberosa*.

P. Pfordtii (Pfordt's). A synonym of *P. Munroi*.

P. pinnatistipula (pinnate-stipuled). A synonym of *Tacsonia pinnatistipula*.

P. pruinosa (mealy). *fl.* solitary, axillary, 3in. across; sepals and petals white; coronal threads numerous, wavy, white, yellow, and blue. *l.* glabrous, palmately three-lobed, dark green; stipules large. British Guiana, 1897. (B. M. 7643; G. C. 1897, xxii., p. 393, f. 117.)

P. quadrangularis variegata (variegated). A variety differing from the type only in its leaves, which are freely covered with yellow spots and blotches. In the case of the type, where the ornamental fruits are liked, artificial fertilisation must be resorted to.

P. triloba (three-lobed).* *fl.* 3in. in diameter; sepals and petals violet, reflexed; coronal threads numerous, violet, banded with white, the outer ones short, the inner ones long, linear, erect, forming a sort of cup around the stamens and pistil. *l.* cordate, entire or three-lobed; stipules biglandular at apex. Peru, 1889. A handsome climber. (I. H. 1889, p. 53, t. 83.)

P. verrucifolia (warted-leaved). A variety of *P. edulis*.

P. violacea (violet).* *fl.* 3in. in expanse; calyx lobes having a distinct spur; sepals and petals pale lilac, oblong, obtuse; outer coronal filaments blue in the middle, white at base and tips, the inner, violet ones shorter; peduncles long. *l.* three-lobed; stipules large, obliquely semi-cordate. Brazil, 1885. A beautiful, stove or greenhouse species. (B. M. 6997; R. H. 1885, p. 468.)

P. Watsoniana (Watson's). *fl.* about 3in. in diameter; sepals green with whitish margins outside, within white, flushed violet, narrow-oblong, horned at apex; petals delicate lilac, similar to the sepals; corona of several rows of erect threads, the outer rows twice as long as the inner, violet, barred white. *l.* three-lobed, 2in. to 2½in. long, 3in. broad, green above, violet beneath. Stove. This hybrid is frequently catalogued simply as *P. Watsonii*. (G. C. 1886, xxvi., p. 648; I. H. 1889, 74.)

Varieties. Besides the varieties named, others worthy of mention are: Comtesse Giuglini, Eynsford Gem, John Spaulding, Imperatrice Eugenie, and Basing Park Hybrid. The last is an interesting hybrid between *Tacsonia mollissima* and *Passiflora racemosa*, for which gardeners are indebted to Mr. Smythe, of Alton.

PATERSONIA. To the species described on p. 33, Vol. III., the following should be added:

P. longiscapa (long-scaped). *fl.* blue, three or four together; ovary and tube velvety; outer segments ¾in. long; bracts glaucous, 2in. long; scape much longer than the leaves. *l.* rigid, linear-lanceolate, 6in. to 20in. long. Eastern Australia. (S. F. A. 39.)

PAUCI-. A Latin prefix, signifying few.

PAULOWILHELMIA (a commemorative name). ORD. *Acanthaceæ*. A genus embracing five species of stove shrubs, endemic in tropical Africa, closely allied to **Ruellia** (which *see* for culture). Flowers large, in scorpioid, axillary, lax cymes; corolla tube 1in. to 3in. long, linear or inflated in the upper part; lobes five,

Paulowilhelmia—*continued.*

contorted in bud; stamens four. Leaves long-petiolate, ovate, irregularly (often coarsely) toothed; bract ovate; bracteoles small or wanting. Only one species is known to cultivation.

P. speciosa (showy), of N. E. Brown. A synonym of *P. togoensis*.

P. togoensis (Togoland). *fl.* blue, disposed in terminal panicles; calyx more than ¾in. long; cymes 1in. to 2½in. long. *l.* 2in. to 5in. long, truncate or sub-cordate at base. Stems stout; viscid-hairy upwards. *h.* 2ft. 1889. SYN. *P. speciosa* (G. C. 1889, vi., p. 749, f. 106).

PAULOWNIA. *Incarvillea tomentosa* (of Roxburgh) is synonymous with *P. imperialis*, which is figured at B. M. 4666. For the shrubbery border this tree, when subjected to the requisite pruning in late autumn, proves

FIG. 617. PAULOWNIA IMPERIALIS.

very effective (see Fig. 617). It should be trained to a single stem and cut down nearly to the base.

PAVETTA. To the species described on p. 35, Vol. III., the following should be added:

P. montana (mountain). *fl.* pure white, Ixora-like, in terminal corymbs. *l.* long-petioled, oblong-lanceolate, acute. Java. A dense, free-growing plant, well adapted for pot culture.

P. natalensis (Natal).* *fl.* snow-white, salver-shaped, with very long-exserted styles, disposed in handsome, densely cymose heads. *l.* lanceolate-oblong, acute, dark, shining green. Natal, 1888. Stove shrub.

PAVIA. To the species described on pp. 35-6, Vol. III., the following should be added:

P. indica (Indian). *fl.* white, red, and yellow, secund; petals four; panicles oblong, nearly equalling or exceeding the leaves. *fr.* reddish-brown, spineless, 1in. to 2in. long. *l.* glabrous; leaflets usually seven, unequal, delicately serrated, distinctly petiolulate, the terminal one 5in. to 9in. long, 1¼in. to 3in. broad, the lateral ones smaller; common petiole 3in. to 6in. long. *h.* 60ft. to 70ft. Western Himalayas, 1844. SYN. *Æsculus indica* (B. F. F. 103, t. 19; B. M. 5117).

P. lutea (yellow). A synonym of *P. flava*.

P. macrocarpa (large-fruited). A synonym of *P. rubra*.

P. neglecta (neglected). A synonym of *P. flava*.

PAVONIA. To the species described on p. 36, Vol. III., the following should be added:

P. intermedia (intermediate). *fl.* whitish, terminal, somewhat clustered; outer bracts eight to twelve, the inner ones rather shorter. *l.* ovate-lanceolate, dentate-serrated, hairy. Brazil.

P. i. kermesina (carmine).* A curious and handsome variety, of dwarf habit. 1894.

P. semperflorens (ever-flowering). The correct name of *Goethea semperflorens*.

P. velutina (velvety). The correct name of *P. malacophylla*.

PEA. To the list of varieties on pp. 39-40, Vol. III., the following should be added:

Earliest Sorts.

A1 (Sutton's).* Wrinkled green marrow. Pods long, straight, usually containing seven to nine large peas of sugary flavour. *h.* 3ft. to 4ft. A heavy bearer, very hardy, and very early.

Early Giant (Sutton's).* Wrinkled green marrow. Pods straight, very long, with seven to ten large peas of fine quality. *h.* 3½ft. A valuable early variety and great cropper.

Empress of India.* Wrinkled marrow. Pods nearly straight, long, and well filled with eight large and sweet peas. *h.* 4ft. Very early and good bearer.

Harbinger (Dickson's).* Wrinkled marrow. Pods straight, closely filled with six medium peas of excellent quality. An early variety that should prove a valuable market sort, being an enormous bearer.

Improved Gem (Hurst and Sons').* Wrinkled marrow. Pods straight, well filled with five peas of very good quality. *h.* 1½ft. An improved form of the well-known CHELSEA GEM, and equally as early, hardy, and productive as that variety.

Productive Marrowfat (Sutton's).* Wrinkled marrow. Pods nearly straight; peas very large and of splendid quality. *h.* 2ft. A great bearer and valuable early variety.

Second Early and Main Crop.

Captain Cuttle.* Wrinkled marrow. Pods very long and slightly curved, very dark green, in pairs, and producing seven to eleven very large peas in a pod, of a fine deep green colour and superior flavour. *h.* 3½ft. A robust and very prolific variety. Excellent for exhibition, and one of the best for main crop.

Eureka.* Wrinkled marrow. Pods nearly straight, large and handsome, containing seven to ten very large peas of fine colour and excellent flavour. *h.* 3ft. A sturdy, productive variety, standing hot weather well.

Magnum Bonum.* Wrinkled marrow. Pods straight, handsome, with eight very large peas in each, of excellent flavour. *h.* 3ft. A splendid variety and a great cropper.

Majestic.* Wrinkled marrow. Pods in pairs, straight, and well filled with seven to nine large, deep green peas of splendid quality. *h.* 2½ft. An excellent cropper.

Saccharine (Sim's).* Wrinkled marrow. Pods in pairs, straight, and averaging eight very large sweet peas in each. *h.* 5ft. A moderate cropper. Fine for exhibition.

The Gladstone.* Wrinkled marrow, pods slightly curved, in pairs, well filled with eleven large, dark green peas of excellent quality. *h.* 4ft. A new variety of great promise.

Late Crop.

Alderman.* Wrinkled marrow. Pods in pairs, nearly straight, broad, closely filled with about nine large, deeply-coloured peas of superior quality. *h.* 5ft. A splendid mid-season or late variety.

Autocrat.* Wrinkled marrow. Pods in pairs, straight, each containing about seven large peas of high quality. *h.* 3ft. A very robust variety, resisting mildew, and most valuable for late supplies.

Late Queen (Sutton's).* Wrinkled marrow. Pods in pairs, straight, very closely packed with about nine large, dark green peas of superior quality. *h.* 3ft. A very late variety, of robust habit, and a great bearer.

Michaelmas (Carter's).* Wrinkled marrow. Pods in pairs, nearly straight, containing seven to nine large peas closely compressed in each pod, of delicious quality. *h.* 3½ft. One of the finest late varieties, and very prolific bearer.

EDIBLE-PODDED OR SUGAR PEAS. If prepared and cooked whole when young, these form an excellent dish, and are of really delicious flavour. The pods should not be cut, as with French Beans or Scarlet Runners, but simply the stalk removed and the pods boiled for about thirty minutes, and served whole. In most varieties it will be found that the pods are of better flavour than the Peas therein. Edible-podded Peas are not cultivated in Britain so much as their merits deserve. The largest and best variety of this class, and a very free bearer, is Sans Parchemin Hatif à Large Cosse (Vilmorin). Pods in pairs, nearly straight, long, thick, and very fleshy, containing seven large Peas in each. Height 4ft.

PEA MILDEW. *See* **Pea—Fungi,** Vol. III.

PEA RUST. *See* **Pea—Fungi,** Vol. III.

PEA, SWEET. *See* **Lathyrus odoratus.**

PEA, TANGIER. *See* **Lathyrus tingitanus.**

PEACH. *Sorts.* Noteworthy additions to the varieties on pp. 42-3, Vol. III., are:

Dagmar. Flowers small. Fruit large, roundish-oval; skin very deep crimson, pale greenish-yellow on the shaded side, and very downy; flesh white, melting, and of delicious flavour. Early in August. Glands usually kidney-shaped. The tree is a free grower, hardy, and very prolific. A very handsome Peach, and forces well.

Early Alfred. Flowers large. Fruit large, round; skin crimson, and pale yellow on the shaded side; flesh white, rich, and melting. End of July or early in August. No glands. A hardy and vigorous variety, and an abundant bearer when true to name. A spurious form is frequently grown under this name.

Early Grosse Mignonne. This is an early form of GROSSE MIGNONNE, possessing all the splendid qualities of that excellent variety, but nearly a month earlier. A fine sort for forcing. SYN. Large Early Mignonne.

Gladstone. Flowers large. Fruit very large; skin red, and greenish-white on the shaded side; flesh white, melting, full of juice, and a good flavour. Middle to end of August. Glandless. A handsome Peach. Tree hardy and a good bearer.

Lady Palmerston. Flowers small. Fruit large; skin marbled with deep red, and straw colour on the shaded side; flesh white, melting, and of very good flavour. Middle of September. Glands kidney-shaped. An excellent variety in warm positions. It should not be confounded with the worthless LORD PALMERSTON.

Late Devonian. Flowers small. Fruit large, somewhat oval, with a prominent nipple and deep suture; skin deep crimson, and heavily marked with red on the shaded side; flesh pale yellow, stained with red near the stone, melting, and of fine flavour. End of September. A very handsome, new variety raised from a cross between BELLE DE VITRY and LATE ADMIRABLE.

Marquis of Downshire. Flowers small. Fruit large and highly coloured; flesh white, stained with red near the stone, very juicy, and of delicious flavour. End of September. Glands kidney-shaped. One of the hardiest and best late Peaches. SYN. Royal Ascot.

Merlin. Flowers large. Fruit large; skin crimson and pale yellow; flesh white, melting, and very luscious. Middle of August. A very good variety raised from EARLY GROSSE MIGNONNE.

Osprey. Flowers small. Fruit large; skin pale, flushed with red; flesh white, melting, luscious, and of good flavour Early in October. Glands round. One of the latest Peaches.

Raymaekers. Flowers large. Fruit very large, resembling NOBLESSE, but hardier, and an abundant bearer. End of September. Glands round. A handsome, highly-flavoured variety.

Salway. Flowers small. Fruit large, round; skin a deep Apricot-yellow; flesh yellow, and, like all the yellow Peaches, not of high quality. Early in October. Glands kidney-shaped.

Violette Hâtive. Flowers small. Fruit large, round; skin marbled with dark red, pale green in the shade; flesh white, juicy, and of the richest flavour. End of August. Glands round. This variety is one of the hardiest and best Peaches, succeeding equally well in the forcing-house or outside.

Waterloo. Flowers large. Fruit large, round; skin light green, with bright red on the exposed side; flesh whitish, firm, juicy, and of good flavour. Middle of July. Glands round. This is an American variety, and valuable for forcing from its earliness, and is not so prone to cast its buds as EARLY ALEXANDER, which ripens at the same time. It is also a good Peach to travel.

FUNGI. Silver-Leaf is a most puzzling disease, doubtless of fungoid origin, found upon Plums, Greengagés, Peaches, Sloes, Birdcherries, and Portugal Laurels. It is most destructive. The foliage of the affected trees turn silvery on their upper surface, and somewhat sickly-looking, yellowish, on the under-surface. Very frequently the upper cuticle separates from the other leaf portions. The fruits become brown, and are shed in large quantities, and the disease seems to spread rather rapidly. The specific fungus responsible for the mischief has yet to be discovered, but it is believed to be a near relative of *Exoascus deformans*, responsible for **Peach Curl.** The treatment found of most avail is to lift the trees at the proper season—when inactive—and dress the soil with sulphate of iron; or the affected portions may be cut out. Root-pruning has also in certain cases proved beneficial. In this latter case the "wood" must be the guide to the gardener.

PEACH CURL (*Exoascus deformans*). As the specific name implies, it deforms the parts affected. The leaves are curled, blackened, and frequently distorted, but the branches also participate, and the trees generally are much injured. Apart from the characteristics above

Peach Curl—*continued.*

noted, the leaves affected assume a yellowish or red colour, and fall. The disease manifests itself in spring, and both infested leaves and shoots should be removed and burnt. Spraying with a weak solution of Bordeaux Mixture should be used to prevent the spores which are disseminated from germinating, and thus increasing the area of infection.

PEACOCK BUTTERFLY. *See* **Vanessa.**

PEACOCK TIGER FLOWER. *See* **Tigridia Pavonia.**

FIG. 618. PEAR CONFERENCE.

PEAR. Some of the finest of the varieties introduced during the last ten years or so are included in the enumeration below. We also illustrate three of the older and very distinct varieties: Conference (Fig. 618), Des Deux Sœurs (Fig. 619), and Emile d'Heyst (Fig. 620).

Beacon. Fruit large, long-pyriform; eye large, set in a shallow basin; skin yellow, flushed on the exposed side; flesh white, melting, and good if gathered before fully ripe, insipid if ripened on the tree. August. The tree is hardy, handsome, and a good bearer.

Beurré Baltet Père. Fruit large, obovate; eye large and open; skin green, covered with red on the exposed side; flesh melting and well flavoured. November. A handsome Pear, and a good cropper.

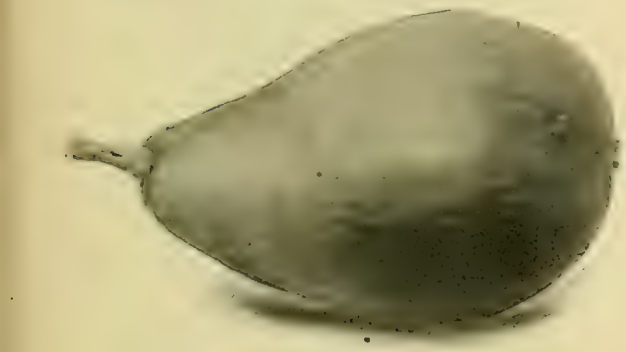


FIG. 619. PEAR DES DEUX SŒURS.

Beurré Dumont. Fruit medium to large, obovate; eye small and full; skin russety; flesh white, melting, and delicious, with

Pear—*continued.*

a very agreeable musky aroma. November and December. An excellent variety for pyramid or cordon.

FIG. 620. PEAR EMILE D'HEYST.

Marguerite Marillat. Fruit large, obovate; eye small, in a shallow basin; skin greenish-yellow, russety, and flushed on the exposed side; flesh white, melting, and very juicy, with a rich aromatic flavour. A new French variety of much promise.

Marie Guise. Fruit medium size, juicy, melting, and rich. February to March. See Fig. 621.

Princess. A larger and later form of LOUISE BONNE DE JERSEY. November and sometimes December.

Triomphe de Vienne. Fruit very large, long-pyriform; eye small, partly closed, set in a shallow basin; skin yellow, usually covered with russety dots; flesh white, juicy, and of excellent flavour. September. Tree hardy, strong, and an abundant bearer.

FIG. 621. PEAR MARIE GUISE.

FUNGI. To the list of fungi injurious to Pears enumerated in Vol. III., must be added *Taphrina bullata*, which is responsible for the condition known as Pear-leaf Blister, and which is quite different from that due to the attacks of the Gall-Mite. The fungus is a near relative of *Exoascus deformans*, causing Peach Curl, but unlike that species it does not distort the leaves. The blisters may not be noticed at first, so closely do they approximate to the general leaf-colour; and it is not until the brown, or it may be the fruit-producing stage (white), that the symptoms of attack are observed.

Weak Bordeaux Mixture is the preventive to employ, combined with the destruction by fire of all infested leaves which fall or which can be reached.

PEAR BLIGHT. *See* **Apple and Pear Blight.**

PEAR-LEAF BLISTER (*Taphrina bullata*). *See* **Pear—Fungi.**

PEAR-LEAF BLISTER MITE (*Phytoptus pyri*). *See* **Pear—Insects,** Vol. III.

PEAR-LEAF CLUSTER CUPS (*Gymnosporangium sabinæ*). A popular name bestowed upon the fungus described and illustrated in Vol. III., p. 54.

PEAR-LEAF RUST (*Gymnosporangium Sabinæ*). *See* **Pear—Fungi,** Vol. III.

PEAR MIDGE (*Diplosis pyrivora*). This is a dipterous, gnat-like fly, which appears in the early spring, the females depositing their eggs in the unexpanded blossoms. The larvæ when hatched enter the young fruit, hindering its growth, causing it to be deformed, to crack, and eventually to fall. The pupal state is assumed in the soil, and the insect passes the winter in that condition. Spraying with arsenite is not of much good, as to do so when the fruit trees are in blossom would be to sacrifice the whole crop; while, once the insects are in the young fruits, they are perfectly safe from insecticides. Preventive measures consist in the collection of the fallen fruits which show signs of infestation, and burning them before the larvæ can enter the ground to pupate. In America, kainit, as a dressing under the trees in late summer, has been found of service, using it at the rate of half a ton per acre. The gnat is only 2mm. long, and the larva also about 2mm., yellowish, and footless. These larvæ are very lively, and move by a series of jerks and bends much after the fashion of the aquatic larvæ of certain relatives. Infested fruits which are hanging might readily be shaken on to sheets laid under the trees.

PEAR SCAB. *See* **Apple and Pear Scab.**

PEAR SUCKER (*Psylla pyrisuga*). *See* **Pear—Insects,** Vol. III.

PEARL CUDWEED, or **PEARLY EVERLASTING.** *See* **Anaphalis margaritacea.**

PEAT-PLANTS. Plants that thrive best in peat include many tender and hardy species far too numerous to name. A few of the principal are many kinds of Orchids, Ericas, Epacris, and Azaleas grown under glass. A great many of the American shrubs and plants require peat, as do all the bog plants amongst hardy subjects.

PEDICULARIS. According to the Kew authorities, *P. Hoffmeisteri* is synonymous with *P. megalantha*.

PEDILANTHUS. Of *P. tithymaloides* there are two forms, *variegatus* and *v. cucullatus*, each having leaves bordered with white, and in the latter the edges of the leaves are drawn up, imparting a cupped effect. *P. carinatus* is synonymous with *P. tithymaloides*.

PEKEA. Included under **Caryocar** (which *see*).

PELARGONIUM. Including *Dimacria*. To the species and varieties described on pp. 61-5, Vol. III., the following should be added:

P. acerifolium (Maple-leaved). The correct name of *P. angulosum*.

P. atrum (dark). The correct name of *P. hirsutum*.

P. Cotyledonis (Cotyledon-like). *fl.* white, not unlike those of *P. zonale*. *l.* ovate, peltate, dark green, hairy. Stems thick, fleshy, branched, dark brown. St. Helena (on rocky cliffs), 1899.

P. Drummondi (Drummond's). *fl.* rosy-red; petals obovate, the two posterior ones conniving and streaked with red; peduncles 3in. to 6in. long, many-flowered. May. *l.* long-petiolate, 3in. to 5in. across, orbicular-cordate, five-lobed, crenate-toothed; stipules very large. *h.* 2ft. or more. Australia, 1892. A pubescent under-shrub. (B. M. 7346.)

P. hederæfolium (Ivy-leaved). A synonym of *P. peltatum*.

P. lateripes (lateral-stalked). *fl.* in many-flowered umbels. *l.* cordate, five-lobed, somewhat toothed, fleshy, glabrous. Stem shrubby; branches fleshy, terete. 1807. Very like the Ivy-leaved Pelargonium (*P. peltatum*), but the petiole is inserted at the margin of the leaf.

Pelargonium—*continued.*

P. multibracteatum (many-bracted). *fl.* white, numerous, umbellate. *l.* deeply lobed, bronzy-green, marked with a dark zone. Stems trailing. Abyssinia, 1892.

P. odoratissimum (very fragrant). *fl.* white, very small; peduncles five- to ten-flowered. July. *l.* strongly and sweetly aromatic; cauline ones roundish-cordate, very obtuse, entire or repand-lobulate, velvety, on petioles 6in. to 10in. long. Stem short, simple or branched; flowering branches long and trailing. 1724. Shrubby. (Sw. Ger. 299.)

P. saxifragoides (Saxifrage-like). *fl.* pink and purple, small. *l.* bright green, fleshy, resembling those of a Saxifrage. 1890. A dwarf, compact species, belonging to the same group as *P. peltatum*.

P. violareum (Viola-like). The correct name of *P. tricolor*.

Varieties. The following is a list of selected varieties:

Large-flowered Show Pelargoniums.

BLUSH-ROSE, ground colour blush-rose, upper petals blotched with crimson; J. DOUGLAS, rosy-pink, distinct white centre, upper petals blotched with maroon, free habit, with large bold flowers; J. W. HAYES, a dark-coloured sport from MARTIAL; LILY, lower petals rosy-crimson, upper petals blotched with rich crimson, pale edges, a pretty, distinct variety.

Decorative Pelargoniums.

ALICE M. LOVE, salmon-rose, free, and fine habit; EMPRESS OF INDIA, deep salmon-scarlet, upper petals blotched with crimson, pale centre, fine habit, excellent; H. J. JONES, rosy-red, maroon blotch in upper petals, dwarf, and very free; LORD ROBERTS, rich rosy-red, shaded with cerise, a lovely variety, of fine, free habit.

Zonal and Nosegay Pelargoniums.

Single-flowered Varieties adapted for Pot Culture. ADOLPHE BRISSON, carmine, shaded with pink towards a white centre, remarkably floriferous, and of fine, dwarf habit; ALBION, pure white, dwarf, and very free; BIRTHDAY, pale salmon, large flowers and trusses, excellent; CRABBE, salmon-red, fine form, large flowers and trusses, dwarf, and free; JULES LEMAITRE, crimson, large trusses, very free-flowering; LECOMTE DE LISLE, orange-scarlet, shading to a beautiful blush-pink centre, very free and good; MADAME BEAUVRON, pink, deeply spotted with red, a pretty and unique variety, of good floriferous habit; MISS JOLIFFE, soft pink, fine form, dwarf, and excellent; MRS. ROBERT CANNELL, salmon, large flowers, freely produced in large trusses; NIAGARA, pure white, dwarf, and free-flowering; PAUL CRAMPEL, crimson-scarlet, very large flowers and immense trusses, one of the best; PHYLLIS, salmon, excellent; ZENOBIA, rosy-scarlet, very free-flowering.

Single-flowered Varieties specially adapted for Bedding. ALBION, white, dwarf, and free-flowering; MRS. FRENCH, pink, very free, and of compact habit; MRS. NORMAN, salmon, very

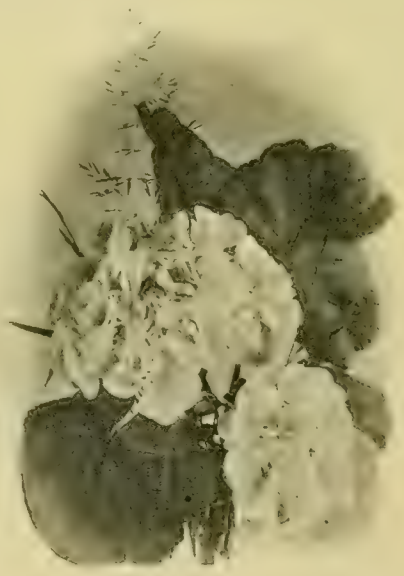


FIG. 622. DOUBLE ZONAL PELARGONIUM.

Pelargonium—*continued.*

floriferous, bushy habit; PAUL CRAMPEL, crimson-scarlet, excellent; ROYAL VISIT, deep scarlet, dwarf, and free-flowering.

Double-flowered Varieties (Fig. 622) *adapted for Pot Culture.* ADVANCER, pure white, very free-flowering, dwarf, and compact; CAPTAIN H. COLVILLE, brilliant scarlet, trusses large and freely produced, compact habit; DOUBLE JACOBY, a double form of the dark crimson HENRY JACOBY, with all that old favourite's good habit; DUKE OF FIFE, semi-double, a splendid scarlet sport from F. V. RASPAIL; HERMINE, semi-double, pure white, very free, and one of the best for winter flowering; SIR HAMILTON, magenta, sturdy habit, and very floriferous; VILLE DE POITIERS, scarlet, free-flowering, and of dwarf habit.

Ivy-leaved Pelargoniums.

Double and Semi-Double Flowered. ERNEST BERGMAN, crimson-scarlet, trusses and flowers very large; LA FRANCE, soft lilac, flowers very large and distinct, dwarf, compact habit; SOUVENIR DE CHARLES TURNER, deep pink, feathered with deep maroon in the upper petals, flowers and trusses very large, one of the best.

Scented-leaved Pelargoniums.

CRISPUM, foliage small and sweetly citron-scented; DENTICULATUM MAJUS, foliage of medium size and finely cut, habit compact, sweetly scented; FAIR HELEN, large Oak-leaved foliage, strongly scented; FILICIFOLIUM ODORATUM, foliage beautifully cut and Fern-like, with a very pleasing scent; LADY MARY, medium foliage, nutmeg-scented; LADY PLYMOUTH, medium foliage, prettily variegated; PHEASANT'S FOOT, foliage in the form of a pheasant's foot, sweet-scented, good habit; PRETTY POLLY, foliage large and almond-scented, dwarf habit; PRINCE OF ORANGE, foliage small, richly orange-scented, dwarf habit; QUERCIFOLIUM, foliage large and Oak-leaved, not agreeably scented, but ornamental; RADULA MAJOR, foliage small and Fern-like, citron-scented; SHOTTESHAM PET, foliage medium and Filbert-scented, dwarf habit; VARIEGATED PRINCE OF ORANGE, a variegated form of PRINCE OF ORANGE.

PELECYPHORA. To the species, &c., described on p. 65, Vol. III., the following varieties should be added:

P. aselliformis cristata (crested). A cockscomb or crested form.

P. a. pectinatus (comb-like). A variety with larger scales than the type. (R. G. 1885, p. 25, under name of *P. pectinatus.*)

PELEXIA. To the species described on p. 65, Vol. III., the following should be added:

P. adnata (adnate). The correct name of *P. spiranthoides.*

P. maculata (spotted). *fl.* green, tipped with pink; scape purple, 1ft. long, clothed with sheaths and bracts. *l.* shining olive-green blotched with grey above, purplish below. 1893.

P. olivacea (olive-green). *fl.* pubescent, disposed in a raceme 6in. long; sepals olive-green; petals and lip white. *l.* olive-green, marked with two silvery bands. Andes, 1891.

P. roseo-alba (pinkish-white). *fl.* white, borne on erect scapes 1ft. high. *l.* olive-green, spotted with white. Brazil, 1892. SYN. *P. Travassosii.*

P. saccata (saccate). *fl.* green, small, with a whitish lip; raceme 6in. long. *l.* ovate, 6in. long, 2in. broad, light green, prettily marbled with grey. Guatemala, 1895. Allied to *P. maculata.*

P. Travassosii (Travassos'). A synonym of *P. roseo-alba.*

P. Wendlandiana (Wendland's). *fl.* greenish-brown with a white lip, disposed in a spike. Stem 2ft. high. 1892. Mainly of botanical interest.

PELICAN FLOWER. *See* **Aristolochia gigas** (the correct name of *A. grandiflora*).

PELIOSANTHES. To the species described on p. 66, Vol. III., the following should be added:

P. albida (whitish). *fl.* white, small; raceme longer than the petioles, stout, erect; scape very short. Summer. *l.* elegantly tufted, five- to eight-nerved, 1ft. long, 1½in. to 2in. broad, elliptic-lanceolate, caudate-acuminate; petioles stout, 6in. long. Malay Peninsula, 1885. Plant dwarf. (B. M. 7110.)

PELLÆA. Cliff Brake Ferns. Coming as they do from various and distantly-situated parts of the globe, Pellæas are well adapted for the ornamentation of the stove and of the greenhouse alike; such species as *P. falcata*, *P. rotundifolia*, and *P. atropurpurea* (Fig. 623) are very nearly hardy in some favoured parts of this country. All the Pellæas are of small or medium dimensions, and are very useful for planting in rockeries or in small hanging-baskets, in which positions they are much more effective than when grown in pots. They require but little soil, and a comparatively exposed situation suits them best. They flourish in a compost

Pellæa—*continued.*

of a light and very porous nature, such as a mixture of two parts peat, one part loam, and one part silver-sand, or, better still, pulverised old mortar, in which their thin, fibrous roots delight to run. Pellæas should not at any time be allowed to get dry at the roots, but their foliage should never be wetted. They prefer being kept close to the light, which is never too strong for them, provided they are sheltered from the direct rays of the sun.

FIG. 623. PELLÆA ATROPURPUREA.

Most cultivated Pellæas are readily propagated by means of spores, which are abundantly produced and germinate freely. Those species which are provided with running rhizomes may be propagated by division, an operation performed most successfully during March and April.

To the species described on pp. 66-7, Vol. III., the following should be added:

P. adiantifolia (Adiantum-fronded). A garden synonym of *P. hastata.*

P. adiantoides (Adiantum-like).* *sti.* black, shining, 1ft. or more in length. *fronds* 1½ft. to 2ft. long, broadly ovate, bipinnate; pinnæ at the base having seven to ten pinnules, the rest gradually decreasing upwards to a simply-pinnate apex; barren pinnules ovate and bluntly toothed, the fertile ones more entire and acute, those next the midrib occasionally auricled, the terminal one hastate. *sori* in a narrow, continuous, marginal line. West Indies. A handsome and vigorous greenhouse species. SYNS. *Platyloma adiantoides, Pteris adiantifolia, Pteris adiantoides, Pteris latifolia.*

P. alabamensis (Alabama). *sti.* wiry, polished, blackish, 2in. to 4in. long, covered at base with reddish-brown scales, as also is the short-creeping, branched rhizome. *fronds* broadly ovate, 4in. to 8in. long, 1½in. to 2in. broad, bi- or tripinnatifid; pinnæ numerous, closely placed, coriaceous, cut to the midrib into numerous narrow-oblong segments, which are mostly entire, but the lowest are again pinnatifid. *sori* having a broad involucre. North America. Greenhouse. SYNS. *Allosorus alabamensis, Cheilanthes alabamensis.* (H. S. F. ii., p. 89, t. 103B.)

P. cordata sagittata (arrow shaped). This is closely related to the variety *flexuosa*, but its fronds are not zigzag, and its habit, instead of being drooping, is upright. *fronds* triangular, bipinnate, 1½ft. to 2ft. long; pinnules rolling their margins under and becoming arrow-shaped when fertile, cordate when barren. SYNS. *Allosorus sagittatus, Platyloma sagittata.*

P. decomposita (decompound). The plant found in catalogues under this name is *P. angustifolia*, described in Vol. III.

P. sagittata (arrow-shaped). A form of *P. cordata.*

PENÆA. One or two species formerly included hereunder are now referred to **Sarcocolla.**

PENNISETUM. To the species described on p. 69, Vol. III., the following should be added:

P. giganteum (gigantic). *fl.*, spikes nodding, solitary or in pairs in the upper axils, slender, pedunculate. *l.* narrow-linear-lanceolate. *h.* 5ft. to 6ft. Habitat not recorded, 1884. A stove Grass.

P. longistylum violaceum (violet).* A variety distinguished from the type in having long, metallic-violet awns to the spike. 1888.

P. orientale (Eastern).* *fl.* disposed in a spike 5in. to 16in. long; rachis stout, hairy, sub-terete, not grooved or notched; bristles ⅜in. to ⅝in. long, all very slender, flexuous, often purplish. *l.* 1ft. to 2ft. long, ⅛in. to ¼in. broad, glabrous or hairy. Stem 2ft. to 6ft. high, erect or ascending. Asia and North Africa, 1895. Annual. SYN. *P. Ruppellianum* (I. H. 1895, p. 206).

P. Ruppellianum (Ruppell's). A synonym of *P. orientale.*

P. triflorum (three-flowered). This is a synonym of *P. orientale*, of Nees.

P. villosum (villous). *fl.* white, disposed in long, dense, feathery spikes. Abyssinia, 1891. A species of tufted habit; it may be treated as a half-hardy annual or as a greenhouse perennial.

PENTACERAS. Included under **Buettneria** (which *see*).

PENTACHÆTA. *P. bellidiflora* is the correct name of *P. aurea.*

PENTALOPHUS. Included under **Lithospermum** (which *see*). *P. longiflorus* is a synonym of *L. angustifolium.*

PENTAPHRAGMA. *See* **Araujia.**

PENTAPHYLLON. Included under **Trifolium** (which *see*).

PENTARRHAPHIA. SYN. *Conradia.* To the species described on p. 70, Vol. III., the following should be added:

P. Craniolaria (Craniolaria). *fl.* greenish-yellow, dotted with black, five or six on a peduncle 5in. to 6in. long; corolla lobes fringed. Summer. *l.* petiolate, obovate-cuneiform, runcinate or lobed, glabrous above, hispid beneath. *h.* 3ft. to 4ft. St. Domingo. SYN. *Craniolaria fruticosa.*

P. longiflora (long-flowered).* *fl.* bright scarlet, few in long-peduncled, axillary or supra-axillary cymes; corolla 1½in. long. Summer and autumn. *l.* 3in. to 5in. long, ovate- or oblong-lanceolate, acuminate, serrulate, dark green above, pale beneath; petioles ½in. to ¾in. long. West Indies. A small, sparingly-branched shrub. (B. M. 7339.) SYN. *Conradia ventricosa.*

PENTAS. To the species described on p. 71, Vol. III., the following variety should be added:

P. carnea Quartiniana (Quartin's).* A fine variety, flowering more freely than the typical plant. Abyssinia, 1893.

PENTHORUM (from *pente*, five, and *horos*, a column; in allusion to the five-angled, five-beaked capsule). ORD. *Crassulaceæ.* A small genus (three species) of hardy, erect, perennial herbs, natives of North America, China, &c., and allied to **Sempervivum** (which *see* for culture of *P. sedoides*). Flowers greenish, unilateral; calyx five-partite; petals five or wanting; stamens ten; cymes terminal. Leaves alternate, lanceolate, acute at both ends, sessile, serrated.

P. sedoides (Sedum-like). *fl.* pale greenish-yellow; petals often wanting; branches of the cyme many-flowered. July to September. Stem somewhat branched, angular above. North America (in ditches and wet places).

PENTSTEMON. To the species and varieties described on pp. 71-4, Vol. III., the following should be added. Attractive, however, as some of the species and their varieties are, they are, taken generally, inferior to the hybrids now in cultivation and obtained from *P. Hartwegii*, *P. gentianoides*, and *P. Cobæa.*

P. cæruleus (blue). *fl.* blue, varying occasionally to rosy-lilac or white; corolla ⅝in. to ¾in. long; thyrse spike-like, usually dense. Summer. *l.* all lanceolate to narrowly linear (often 3in. long and only a line or two broad).

P. Clevelandi (Cleveland's). *fl.* crimson; corolla ⅝in. long, with a narrow throat; thyrse narrow. Summer. *l.* rigid, oblong or ovate, acutely and rigidly toothed; uppermost ones usually connate in a disk. Stem woody at base. *h.* 2ft. to 4ft. 1893.

Pentstemon—*continued.*

P. Cobæa purpurea (purple).* *fl.* rich purple, sparingly shaded with violet, much larger than in the type; spikes four to six on established plants. 1882. A charming variety.

P. cyananthus (blue-flowered). A form of *P. glaber.*

P. Douglasii (Douglas'). A form of *P. Menziesii.*

P. Fendleri (Fendler's). A synonym of *P. acuminatus.*

P. gentianoides (Gentian-like). *fl.* violet; corolla nearly 1½in. long; panicle elongated, somewhat interrupted, leafy at base. July. *l.* 6in. or less in length, lanceolate, the upper ones broadly amplexicaul, acuminate, glabrous. Stem 3ft. to 4ft. high. Mexico, 1846. Half-hardy.

P. gentianoides (of Lindley). A synonym of *P. Hartwegii.*

P. glaber speciosus (showy).* *fl.* of a beautiful bright blue, with purplish markings; panicle spike-like, 1ft. long. A narrow-leaved form. 1827. (B. R. 1720; R. H. 1895, f. 124, and S. B. F. G. ser. ii., t. 259, under name of *P. speciosus.*)

P. g. splendens (splendid).* *fl.* dark blue; inflorescence tall. *l.* spathulate, rosulate. 1895. (G. C. 1895, p. 77, f. 25, under name of *P. Gordoni splendens*).

P. Hallii (Hall's). *fl.* lilac, mauve-purple, or nearly violet, five to fifteen in a short, spike-like thyrse; corolla ⅜in. long, broadly campanulate. Summer. *l.* thickish, linear and linear-spathulate, or the lowest broader, obtuse. *h.* 9in. to 12in.

P. Jaffrayanus (Jaffray's). A form of *P. azureus.*

P. lætus (pleasing). *fl.* blue; corolla 1in. long; panicles racemiform, 1½ft. high. July and August. *l.* lanceolate or linear-lanceolate; the lowest spathulate. Plant cinereous-pubescent or puberulent. Allied to *P. Roezlii.*

P. Lewisii (Lewis's). A synonym of *P. Menziesii.*

P. Lobbii (Lobb's). A synonym of *P. antirrhinoides.*

P. Menziesii (Menzies'). *fl.* violet-blue to pinkish-purple; corolla 1in. or more in length; pedicels almost all one-flowered; inflorescence mostly glandular- or viscid-pubescent. Summer. *l.* ovate, obovate, or oblong, ¼in. to 1in. long, rigidly serrulate or entire. *h.* 9in. to 12in. This is also called *P. M. Lewisii.*

P. M. Newberryi (Newberry's). *fl.* rose-purple or pink. (G. C. 1872, p. 959, f. 227, under name of *P. M. Robinsoni.*)

P. procerus (tall). A synonym of *P. confertus cæruleo-purpureus.*

P. puniceus (red).* *fl.* of a bright rose-red or vermilion, funnel-shaped, 1½in. long; cymelets many-flowered. June. *l.* thick, greyish; lower ones oblong or obovate, obtuse; upper ones sub-ovate or lanceolate, clasping. *h.* 1ft. to 6ft. Arizona, 1889. A showy species. (R. H. 1892, f. 135.)

P. Roezlii (Roezl's). *fl.* pale blue or violet; corolla ¼in. to ⅜in. long; thyrse narrow, or more diffuse and compound. Summer. *l.* all lanceolate or linear, or the lower ones oblanceolate. *h.* 9in. to 12in. 1872. (R. G. 1872, t. 239.) Allied to *P. lætus.*

P. rotundifolius (round-leaved).* *fl.* of a bright brick-red, disposed in a lax panicle; corolla about 1in. long. Summer. *l.* opposite, roundish or broadly ovate, glaucous; cauline ones sessile. *h.* 2ft. Mexico, 1888. An attractive species. (B. M. 7055; G. & F. 1888, p. 472, f. 73; G. C. 1888, iv., pp. 264-5, f. 31.)

P. Scouleri (Scouler's). A form of *P. Menziesii.*

P. secundiflorus (side-flowering).* *fl.* blue, suffused with bronze on the upper surface; corolla tube abruptly dilated, the lips widely spreading; peduncles one- to three-flowered. Summer. *l.*, radical ones spathulate; cauline ones narrow-lanceolate, 2in. to 3in. long. *h.* 1ft. or more. Colorado, 1896. A well-marked and beautiful species.

P. speciosus (showy). A form of *P. glaber.*

P. tubiflorus (tube-flowered). *fl.* white or whitish, often with a tinge of purple; corolla funnel-shaped; thyrse twiggy, much interrupted. Summer. *l.* oblong or ovate-lanceolate. Stem 2ft. to 3ft. high. Plant wholly glabrous.

P. Watsoni (Watson's). *fl.* violet-purple or partly white; corolla narrow-funnel-shaped, six to eight lines long; thyrse contracted, rather loose. Summer. *l.*, cauline ones oblong-lanceolate to ovate-lanceolate, acute or acuminate. Stems 1ft. or more in height, ascending or weak. 1896.

Hybrids. Some of the finest hybrids are here enumerated:

AUGUSTE CAIN, CATULLE MENDES, CAVALLIER, CHARIVARI, CHINOISERIE, CLEVELANDII, CONGO, DOMINO, EMILIE DESCHANEL, EMILIE PALADILHE, GENERAL GALLIENI, GEORGE ULRICH, GUILLAUME CAPUS, JEAN MACE, LE BORDA, LEONNEE, LE PROPHETE, MME. FURTADO-HEINE, MATAMORE, NINON DE L'ENCLOS, PRESIDENT CARNOT, SANDORFF, STANISLAS.

PENTZIA. *P. crenata* is the correct name of *P. flabelliformis.*

PEPEROMIA. To the species described on pp. 74-5, Vol. III., the following should be added:

P. inquilina (tenanting). *l.* small, green, fleshy, orbicular. Stems red. Central America, 1892. A small, trailing species.

P. metallica (metallic).* *l.* alternate, lanceolate-oblong, dark green, with metallic reflections, and having a pale greenish stripe along the midrib, and reddish veins beneath. Stem reddish or violet. *h.* 1ft. Peru, 1892. A charming plant. (I. H. 1892, t. 157.)

P. obtusifolia (obtuse-leaved). The correct name of *P. clusiæfolia.*

P. Sandersii (the correct spelling). *P. Verschaffeltii* is now regarded as distinct from this species.

P. heterostachya (leaves with pale ribs), *P. pellucida*, *P. puberula* (Ref. B., t. 302), and *P. tithymaloides* (SYN. *P. magnoliæfolia*) have also been introduced.

PEPPER, CHINESE or JAPANESE. *See* **Xanthoxylum piperitum.**

PEPPER VINE. *See* **Ampelopsis bipinnata.**

PERAPHYLLUM (from *pera*, a pouch, and *phyllon*, a leaf; in allusion to the membranous expansion of the calyx). ORD. *Rosaceæ.* A monotypic genus. The species is a hardy, much-branched shrub, formerly included under **Amelanchier** (which *see* for culture).

P. ramosissimum (much-branched). *fl.* ⅜in. across, erect, in small, sub-sessile, erect, branched corymbs; petals white with a rose disk, orbicular. May. *fr.* ½in. in diameter, globose, fleshy, edible. *l.* 1in. to 2in. long, obovate-oblong or narrowly oblanceolate, narrowed to a short petiole, entire, at first silky-pubescent. *h.* 2ft. to 6ft. Western North America. (B. M. 7420.)

PERENNIALS. Though the term is frequently employed of plants generally which flower season after season, yet it is oftener restricted to Herbaceous Perennials, a group of plants quite indispensable in the border. Any plant that lives for upwards of two years, and produces soft or succulent stems which die down every year, the roots remaining alive and sending up fresh growth the following year, is commonly designated a Perennial. The number of kinds and varieties of even hardy Herbaceous Perennials is immense, and constantly being added to, forming one of the charming features of the garden; in fact, without these plants our borders, shrubberies, bog gardens, and wild gardens would lose their brightest ornaments.

The cultivation of Perennials entails a considerable amount of knowledge, especially as to soils. Some require a moist, shaded position; others succeed best in a dry, hot aspect; while others will answer in almost any position and soil. Fortunately, the bulk of Herbaceous Perennials come under the latter category, and will give pleasing results in any ordinary garden soil that has been moderately manured. If the soil is heavy, a dressing of long strawy manure and road-scrapings dug in deeply will prove beneficial; if light and porous, cow manure and marl or clay will render it heavier and more retentive of moisture, digging in these ingredients during the autumn or winter, and planting the Perennials in the early spring.

In planting, a knowledge of the height, blossoming, and colour period is essential, so as to have the tall plants at the back of the border and the dwarf ones in front; and also that the colours may blend well when in flower, and so distributed that the flowers are not in a mass in one part and unrepresented in another. Further, the choice should be so made that as one plant goes out of blossom, another in proximity should be commencing, thus giving a succession of blossom.

Nearly all Perennials are easily increased by division, cuttings, or seeds. Taking division first, this is a necessity with many kinds, otherwise they become so overcrowded that their beauty is spoiled. In all cases it is advisable to divide big clumps by hand instead of by cutting them through with a sharp spade or knife, which injures both roots and growths. At the time when new growth is being made is the most suitable period for division, the plants suffering less by check then than at any other season.

Practically all Herbaceous Perennials root rapidly from cuttings put in during the early spring, and inserted in a sandy compost in cold frames or under hand-lights, keeping them close for a fortnight or so, and shaded from bright sun until established. Afterwards the young plants

Perennials—*continued.*

should be gradually exposed to the light and air, and when ready, planted out where they are intended to blossom. Such plants as the Herbaceous Phlox usually produce immense heads of blossom the same season as the cuttings are inserted.

The raising of plants from seed is full of interest, as not only are such the most vigorous, but there is always a possibility that new varieties may be produced through cross-fertilisation by insects. Some seeds lie dormant a long time if not sown immediately they are ripe, as, for instance, *Primula japonica*, which germinates directly if sown at once when ripe; but if kept a few months, it will remain dormant for nearly two years. As this applies to many other Perennials, the seeds ought to be sown when ready in cold frames in boxes or pans, and when large enough the seedlings should be pricked out in nursery-beds, and finally planted out where they are intended to flower.

To give a list of all Perennials would occupy more space than can be spared. We must, therefore, limit the selection to some of the more noteworthy, referring the reader for the chief of the Alpines to **Alpine Plants.**

In the genera enumerated may be found some of the finest of hardy Herbaceous Perennials:

Acanthus	*Dictamnus*	*Myosotis*
Achillea	*Dodecatheon*	*Nepeta*
Aconitum (all parts of plant poisonous)	*Doronicum*	*Œnothera*
	Dracocephalum	*Omphalodes*
Adonis	*Echinops*	*Onobrychis*
Alstrœmeria	*Epilobium*	*Ononis*
Althæa	*Epimedium*	*Orobus*
Alyssum	*Eranthes*	*Ostrowskia*
Anchusa	*Erigeron*	*Pæonia*
Anemone	*Erodium*	*Papaver*
Anemonopsis	*Eryngium*	*Pentstemon*
Antennaria	*Erythronium*	*Phlomis*
Anthericum	*Ferula*	*Phlox*
Aquilegia (Hybrids)	*Francoa*	*Phygelius*
Arabis	*Fuchsia*	*Physalis*
Armeria	*Funkia*	*Physostegia*
Arnica	*Gaillardia*	*Phytolacca*
Arum	*Galega*	*Platycodon*
Arundo	*Gentiana*	*Plumbago*
Asclepias	*Geranium*	*Polygonatum*
Asphodelus	*Gerbera*	*Polygonum*
Asters (Michaelmas Daisies)	*Geum*	*Potentilla*
	Gladiolus	*Primula*
Astragalus	*Glaucium*	*Prunella*
Baptisia	*Gypcrium*	*Pyrethrum*
Bocconia (but needs to be restricted as to roots)	*Gypsophila*	*Ranunculus*
	Hedysarum	*Rhexia*
	Helenium	*Romneya*
Borago	*Helianthus*	*Rudbeckia*
Buphthalmum	*Helichrysum*	*Salvia*
Calandrinia	*Helleborus*	*Saponaria*
Calceolaria	*Hemerocallis*	*Saxifraga*
Callirhoe	*Hesperis*	*Scabiosa*
Campanula	*Hibiscus*	*Scilla*
Carnation	*Hyacinthus*	*Scutellaria*
Cassia	*Hypericum*	*Sedum*
Catananche	*Iberis*	*Silene*
Centaurea	*Incarvillea*	*Sisyrinchium*
Centranthus	*Inula*	*Spigelia*
Chelone	*Iris*	*Spiræa*
Chrysanthemum	*Kniphofia* (*Tritoma*)	*Statice*
Cimicifuga	*Lathyrus*	*Stokesia*
Clematis	*Liatris*	*Stylophorum*
Colchicum	*Lilium*	*Thermopsis*
Commelina	*Linaria*	*Tiarella*
Convallaria	*Linum*	*Tradescantia*
Corcopsis	*Lobelia*	*Tricyrtis*
Coronilla	*Luptnus*	*Trillium*
Cortusa	*Lychnis*	*Trollius*
Corydalis	*Lythrum*	*Tropæolum*
Crambe	*Malva*	*Verbascum*
Cyclamen	*Meconopsis*	*Veronica*
Cynara	*Medicago*	*Vicia*
Cypripedium	*Melittis*	*Vinca*
Delphinium	*Menyanthes*	*Viola*
Dentaria	*Mertensia*	*Zauschneria*
Dicentra	*Monarda*	

PERESKIA. To the species described on p. 76, Vol. III., the following should be added:

P. aculeata rubescens (reddish). *l.* glaucous-green above, tinged with red below. Spines on the old stems shorter and more numerous in each cushion than in the type. *lanceolata* and *rotunda* are two other varieties.

P. lychnidiflora (Lychnis-flowered). *fl.* apricot-yellow, large, Rose-shaped, solitary and terminal; petals toothed and fringed at the ends; stamens very short, with yellow anthers.

Pereskia—*continued.*

l. ample, ovate, acute, caducous, each having a large axillary prickle. Stem and branches cylindrical. Mexico.

P. spathulata (spatula-like). *fl.* red. *l.* spathulate, thick, green, 2½in. long. Trunk ascending, slender, at length woody; areolæ remote, tomentose, the young ones woolly; prickles one or two, rigid, whitish. Mexico.

P. subulata (awl-like). *l.* subulate, slightly channelled, 5in. to 6in. long. Stem fleshy, several yards in height and 2in. in diameter, naked at apex; areolæ prominent. Valparaiso.

FIG. 624. PERESKIA ZINNIÆFLORA.

P. zinniæflora (Zinnia-flowered).* *fl.* rosy-red, terminal on the ripened young shoots, and composed of a whorl of broad, overlapping petals, nearly 2in. across, with a cluster of stamens in the centre. Stem erect, woody, branching freely; branches bearing oval, acuminate, fleshy, wavy-edged, green leaves, with short petioles, and a pair of spines in the axil of each; spine cushions on old stems crowded with stout, brown spines. Mexico. A well-marked species, in the way of *P. Bleo.* See Fig. 624.

PEREZIA. To the species described on p. 76, Vol. III., the following should be added:

P. multiflora (many-flowered). *fl.-heads* bluish, terminal, corymbosely clustered; involucral scales in two or three series, the outer ones mucronate; pappus somewhat reddish. *l.* amplexicaul, oblong, sinuate-toothed. Stems erect. Brazil. Annual. SYN. *Homoianthus multiflorus.*

P. sonchifolia (Sonchus-leaved).* *fl.-heads* white, somewhat resembling a miniature double Camellia; florets all ligulate, imbricated. *l.* Thistle-like; radical ones elongated, cut; cauline ones much smaller, alternate, sessile. Stems erect, simple and branched. Uruguay, 1895. A pretty annual. (Ill. H. 1895, p. 134.)

PERFORATE. Pierced with small, round holes.

PERGULARIA. *P. sanguinolenta* is now considered to be a species of *Cryptolepis*, a genus not otherwise represented in gardens.

PERICOME (from *peri*, around, and *kome*, a tuft of hairs; there is a tuft of long hairs all around the margin of the achenes). ORD. *Compositæ.* A small genus (two species) of half-hardy, shrubby perennials, natives of the Mexican region, and closely allied to **Palafoxia** (which *see* for culture). Flower-heads crowded and corymbose or loosely paniculate, heterogamous, radiate; involucre campanulate, the bracts in

Pericome—*continued.*

one series. Leaves opposite or the upper ones alternate, petiolate, acuminate. Only one species has been introduced.

P. caudata (tailed). *fl.-heads* golden-yellow, ¼in. or less in height, numerous in terminal, corymbiform cymes. *l.* long-petiolate, triangular-hastate, 2in. to 5in. long, with sparingly crenate-toothed or entire margins. *h.* 3ft. to 4ft. Colorado, 1896. Plant strongly scented, widely branching.

PERIDERMIUM STROBI. This fungus is responsible for the **Bladder Rust**, or **Weymouth Pine Rust** (which *see*). It is also found upon *Pinus Cembra* and *P. Lambertiana.* It is heterœcious, the other stage being passed upon Currants, when it is known as *Cronartium ribicolum.*

PERIGYNOUS. This term is also used to indicate stamens that adhere to the calyx but are free of the ovary.

PERILLA. To the species, &c., described on p. 78, Vol. III., the following variety should be added:

P. arguta atropurpurea (sharp, dark purple). A synonym of *P. ocimoides crispa.*

P. ocimoides rosea (pink). *l.* variegated with red, pink, light green, and whitish. 1897. SYN. *P. nankinensis rosea.*

PERIPLOCA. *Campelepis* is synonymous with this genus, which now embraces about sixteen species.

PERISPORACEI. *See* **Pyrenomycetes.**

PERISTERIA. SYN. *Eckardia.* To the species described on p. 79, Vol. III., the following should be added:

P. aspersa (bestrewn). *fl.* large, about ten in a short raceme; sepals and petals yellowish-brown, covered with brownish-red dots; front of the lip dark crimson. Pseudo-bulbs 4½in. high and more than 7in. in diameter. Venezuela, 1891. (L. vi., t. 267.)

P. Ephippium. *fl.* having broadly-linear fleshy arms to the column, and a rhomboid three-lobed epichil to the lip; callus broad, ribbed and furrowed, the ribs meeting and prolonged in a thick line to the apex of the mid-lobe. Andes (?), 1883. Allied to *P. pendula.*

P. læta (pleasing). *fl.* bright yellow, somewhat resembling those of *P. cerina*; sepals and petals spotted dark purple, the former oblong, the latter cuneate-rhomboid; lip with smaller spots than those on the sepals and petals; bracts ovate, triangular; raceme porrect, several-flowered. *l.* two or three, plicate, oblong-lanceolate, acuminate. Pseudo-bulbs pyriform. Origin unknown, 1887.

P. Lindeni (Linden's).* *fl.* seven to twelve in a raceme; sepals and petals green, flushed with deep purple except at the tips and spotted with blackish-purple; lip margined and striped with the same colour on a light ground. February. *l.* large, deep green, plicate. Pseudo-bulbs elongated-obovoid. Habitat not recorded, 1892. A handsome species. (L. vii., t. 328.)

P. Rossiana (H. J. Ross's). *fl.* differing only in the lip and column from those of *P. pendula.* Pseudo-bulbs the size and shape of a hen's egg. Habitat not recorded, 1889.

P. selligera (saddle-bearing). *fl.* the same colour as those of *P. pendula*, the epichil being perhaps yellower; column armless; callus saddle-like, with deep, argute margins, covering the whole disk. Demerara, 1887. This is closely related to *P. pendula.*

PERNETTYA. To the species described on p. 80, Vol. III., the following should be added:

P. floribunda (abundant-flowered). A hardy shrub, in the way of *P. mucronata*, of which it is probably a variety, but more free-flowering and with larger crimson berries. Extra-tropical South America, 1833. (G. C. 1833, xviii., p. 643, f. 113.)

P. mucronata. Of this there are a number of beautiful forms, the best being *carnea nana, coccinea, lilacina, macrocarpa, nigra major, rosea purpurea, sanguinea*, and *speciosa.* All are useful for pot culture, for room and window decoration in winter and early spring.

P. phillyreæfolia (Phillyrea-leaved). *fl.* white, solitary; corolla ovate-urceolate; pedicels axillary. *l.* lanceolate, sharply mucronate, remotely toothed, glabrous, one-nerved. Branchlets sparsely bristly. *h.* 1ft. Peru. SYN. *Arbutus phillyreæfolia.*

PERONEA COMARIANA. This is the correct name of the pest referred to under **Strawberry—Insects** as *P. comparana.* It is synonymous with *P. proteana* and *P. potentillana.*

PERONEA VARIEGANA. *See* **Rosa—Insects.**

PERONOSPORA GANGLIONIFORMIS. *See* **Lettuce Mildew.**

PERONOSPORA VIOLÆ. *See* **Violet Fungi.**

PERSEA. To the species described on p. 82, Vol. III., the following should be added:

P. carolinensis (Carolina). Red Bay. *fl.* silky, in cymose clusters, on peduncles shorter than the petioles; calyx lobes unequal, persistent. July. *fr.* dark blue. *l.* oblong or lanceolate-oblong, 2in. to 3in. long, smooth and deep green above, glaucous beneath, obscurely veined. Branchlets smoothish. *h.* 20ft. to 40ft. North America. SYN. *Laurus carolinensis.*

P. indica (Indian).* *fl.*, calyx whitish, ¼in. long; panicles 3in. to 6in. long, crowded in a terminal corymb, and, as well as the petioles and branchlets, silky-woolly. *l.* coriaceous, elliptic- or lanceolate-oblong, 3in. to 8in. long. Canary Islands, &c. A showy tree, furnishing hard and very beautiful wood. SYN. *P. teneriffæ.*

P. teneriffæ (Teneriffe). A synonym of *P. indica.*

PERSIAN SUN'S-EYE. *See* **Tulipa Oculus-solis.**

PERSICA. To the species and varieties described on p. 83, Vol. III., the following should be added:

P. vulgaris. This species is also known as *Amygdalus persica.*

P. v. alba flore-pleno (white, double-flowered). *fl.* of the purest white, semi-double. 1899. A very pretty, free-flowering shrub, admirable for conservatory decoration.

P. v. magnifica (magnificent).* *fl.* bright red, large, semi-double, produced in great abundance. 1894. A beautiful shrub, frequently catalogued as an *Amygdalus.*

P. v. præcox (early).* A hardy variety of the double-flowered Peach, which commences to blossom some days earlier than the common form.

PERSONATE. Masked; having the upper and lower lips of an irregular gamopetalous corolla pressed together so as to resemble the face of a grinning animal.

PERUVIAN DAFFODIL. A name applied to the species of *Ismene*, now included under **Hymenocallis** (which *see*).

PERUVIAN NASTURTIUM. *See* **Tropæolum tuberosum.**

PERUVIAN SWAMP LILY. *See* **Zephyranthes candida.**

PETALODY. The conversion of other floral organs into petals.

PETALOTOMA. A synonym of **Carallia** (which *see*).

PETASITES. Of this genus the Winter Heliotrope (*P. fragrans*), described in Vol. III., is only of value for the wild garden or for water-side planting.

To the species described on p. 84, Vol. III., the following should be added:

P. japonicus (Japanese). *fl.-heads* disposed in a fastigiate thyrse; peduncle furnished with two or three linear bracts. *l.* radical. Japan. SYN. *Nardosmia japonica.*

P. j. giganteus (gigantic).* A variety growing as much as 6ft. high, with petioles edible as in the Rhubarb. Japan, 1897. In its native country the leaves are used as rain-protectors. An excellent subject for the sub-tropical garden.

P. officinalis (officinal). The correct name of *P. vulgaris.*

PETROGETON. Included under **Crassula** (which *see*).

PETROSELINUM. Included under **Carum** (which *see*), the correct name of *P. sativum* being *C. Petroselinum.*

PETUNIA. *Salpiglossis linearis* is the correct name of *P. intermedia.* Some of the most useful varieties in this genus are to be found in the Fringed section, which in some cases resemble closely the best Chinese Primulas. Good varieties for bedding, &c., are Countess of Ellesmere, Dr. Hogg, Hender's Double Fringed, Holborn Blue, Kate Tidy, Miranda, Model, Mrs. Chas. Wilson, Perfection, Rose Superbe, Schwester Boniface, Spitfire, Victoria, W. Brown, and White Queen.

PEUCEDANUM. The Kew authorities include **Anethum** (which *see*) under this genus, the specific name of *A. graveolens* remaining unchanged.

PEUMUS FRAGRANS. A synonym of **P. Boldus** (which *see*).

PHACELIA. SYN. *Cosmanthus.* To the species described on p. 88, Vol. III., the following should be added; but neither is so good as *P. Whitlavia* or *P. campanularia*, described in Vol. III.

P. bipinnatifida (bipinnatifid). *fl.* violet-blue; corolla rotate-campanulate, over ½in. across; racemes few- or many-flowered. July to September. *l.* pinnately three- to seven-parted; divisions ovate or oblong-ovate, acute, coarsely incised or pinnatifid. *h.* 1ft. or more. Alabama, &c., 1824. Annual or biennial.

P. circinata (crozier-like). *fl.* whitish or bluish; corolla moderately five-lobed; inflorescence hispid, the dense spikes thyrsoid-congested. June. *l.* lanceolate to ovate, acute, some of them with one or two pairs of smaller lateral leaflets. *h.* 9in. to 2ft. California, &c., 1817. Biennial or perennial. SYN. *Aldea circinata.*

P. Orcuttiana (Orcutt's). *fl.* white, with a yellow eye, sessile in the at length dense spikes; corolla rotate-campanulate, twice as long as the calyx. *l.* pinnatifid, somewhat lyrate; lobes shortly oblong, entire. *h.* 1ft. Lower California, 1890. A viscid annual.

P. Wrangeliana (Wrangel's). A form of *P. divaricata.*

PHÆDRANASSA. *P. eucrosioides* is now classed as a monotypic genus, under the name **Stricklandia** (which *see*).

PHAIO-CALANTHE. Bigeneric Orchid hybrids, produced through the intercrossing of *Calanthe* and *Phaius.* The cultural requirements are similar to those recommended for **Phaius.**

NAME.	PARENTAGE AND RAISER.
Arnoldiæ	*P. grandifolius* and *C. Regnierii* (Sander).
Berryana	*P. Humblotii* and *C. Masuca* (Sander).
Brandtæ	*P. Wallichii* and *C. Veitchii* (Sander).
grandis	*P. grandifolius* and *C. Bryan* (Cookson).
inquilinus†	*P. vestatus* and *C. Masuca.*
inspirata	*P. grandifolius* and *C. Masuca* (Veitch).
irroratus	*P. grandifolius* and *C. Veitchii* (Veitch).
Niobe	*P. grandifolius* and *C. gigas* (Veitch).
Sedeniana	*P. grandifolius* and *C. Veitchii* (Veitch).

† This hybrid was described by Reichenbach as a Phaius, but should no doubt be classed among the Calanthes.

PHAIUS. The cultural requirements of these are a stove temperature, with highly humid conditions of the atmosphere while growing. During the resting season only sufficient moisture will be required to retain a plump and desirable condition of the pseudo-bulbs. The potting compost should consist of fibrous loam and peat, to which may be added a liberal amount of sphagnum, and sufficient rough sand or broken crocks to keep it porous. The drainage should be clean and ample. Care must be taken to keep the plants free from Thrips and Scale by fumigating and sponging the leaves at regular intervals.

To the species and varieties described on p. 90, Vol. III., the following should be added:

P. albus giganteus (gigantic). *fl.* larger than in the type; sepals and petals pure white; lip golden-yellow. 1896.

P. Bernaysii is, according to the Kew authorities, a variety of *P. Blumei.*

P. bicolor (two-coloured).* *fl.*, sepals and petals reddish-brown; side lobes of the lip rose-coloured and folded over the column, the front lobe being yellowish-white, flushed with rose. Ceylon, 1837. An ornamental species which Sir J. D. Hooker regards as synonymous with *P. Wallichii.* (B. M. 4078.)

P. b. Owenïæ (Mrs. Owen's) is a fine, dark-coloured form of it. 1894.

P. Blumei (Blume's). *fl.*, sepals very acuminate; lip two-crested within, the limb semi-trilobed, the middle lobe largest, undulated. Java (grown in gardens). Closely allied to *P. grandifolius.* (R. G. 1865, t. 464.)

P. B. assamicus (Assam). A one-flowered variety, differing much in colour. The following are some of the chief forms: *luteo-albus, oculatus, picturatus, purpuratus.*

P. Brymerianus (Brymer's). *fl.* large, disposed in terminal, drooping heads; sepals and petals white; lip yellow, with radiating crimson lines. *l.* 9in. long. Stems 2ft. high. Birma, 1894. Allied to *P. Marshallïæ.* SYN. *Thunia Brymeriana* (R. ii., t. 82).

P. callosus (thick-lipped). *fl.*, sepals and petals dull reddish-brown, tipped dingy-white, less numerous than in *P. grandifolius* (which this plant resembles in habit); lip white, with a tinge of pink, a dark purple spot beneath, and a little yellow on the two-lobed spur, truncate or almost two-lobed at the end, with a thick, callous line passing downwards along

Phaius—*continued.*

the middle. Java. (G. C. 1848, p. 287; R. X. O., t. 122.) SYN. *Limodorum callosum.*

P. candidissimus (whitest). *fl.* entirely white; lip trifid, the side lobes toothed in front, the front lobe crested with filiform processes; spur inflated and two-lobed; inflorescence nodding, about six-flowered. Birma, 1889. Much in the way of *P. Marshalliæ.* SYN. *Thunia candidissima.*

FIG. 625. SINGLE FLOWER OF PHAIUS HUMBLOTII.

P. Henryi (Henry's). A synonym of *P. Humblotii* (see Fig. 625), for which we are indebted to the "Gardeners' Chronicle."

P. Humblotii albus (white).* *fl.* rather larger than in the type; sepals and petals white; lip blush, marked with rose, suffused with chestnut-brown, and having a yellow blotch. 1890.

P. luridus (lurid). *fl.* 2in. broad; sepals and petals greenish-yellow and rufous, spreading; lip yellow, with two red blotches; raceme few-flowered; scapes one or two, 1ft. to 1½ft. long. *l.* lanceolate, 1ft. to 1½ft. long. Stem 2ft. high. Ceylon. Terrestrial.

P. Mannii (Mann's). A form of *P. Wallichii.*

P. Marshalliæ ionophlebia (violet-veined). *fl.*, lip having a sulphur-coloured disk and crest, with erose veins to the apex. 1885.

P. M. purpuratus (purple). *fl.*, lip three-lobed, white, spotted with purple, having five yellow keels across the disk and numerous yellow filiform processes; front part veined bright purple-brown outside. 1888.

P. M. tricolor (three-coloured). *fl.* disposed in long, pendulous racemes; sepals and petals pure white; lip orange-yellow, marked crimson-purple. 1887.

P. M. trilobus (three-lobed). *fl.*, lip three-lobed, broad, having dark reddish-brown veins and twelve darker rows of toothed crests. 1888.

P. Mastersianus (Dr. Masters'). This species is described as being allied to *P. albus,* but having flowers scarcely half the size, with a more campanulate lip. *l.* 10in. to 12in. long, crowded, distichous. Stems 4ft. high. Moulmein. SYNS. *Thunia Mastersiana,* and *T. pulchra* (of Reuhl).

P. mishmensis (Mishmi Hills). *fl.* pale rose, with white spots on the lip and a yellow spur, erect, 1½in. long; lip trilobed, the mid-lobe bilobuled; raceme lax-flowered; scapes one or two, rather slender, erect, 1¼ft. long. *l.* 6in. to 12in. long, alternate, elliptic-lanceolate. Stem 3ft. to 4ft. long. Mishmi Hills, Upper Assam, 1893. SYNS. *P. roseus, Limatodes mishmensis.*

P. niveus and **P. nivalis** (snowy). Garden names for *P. albus.*

P. Oweniæ (Mrs. Owen's). A form of *P. bicolor.*

P. pauciflorus (few-flowered). *fl.* white, tinged with pale yellowish; lip marked with red; racemes cauline, short, few-flowered. May. *l.* elliptic-lanceolate, long-acuminate. Stems slender, erect. Java. (B. M. 7086.) SYN. *Limatodes pauciflora* (P. F. G., t. 81).

P. philippinensis (Philippines). *fl.* not fully expanding; sepals and petals reddish-brown, passing into light yellow at the margins, white outside; lip white, slightly tinged with pink, changing with age to pale yellow, trumpet-shaped; raceme

Phaius—*continued.*

few-flowered. August. *l.* lanceolate, 1ft. to 1½ft. long. Pseudo-bulbs like the rhizome of an Iris, 1½in. to 2in. long. Philippine Islands, 1889.

P. Robertsii (Roberts').* *fl.* brownish-yellow, streaked with red; lip destitute of a spur. New Caledonia, 1884. Described as a handsome species.

P. Rœblingii (Roebling's). *fl.* 5in. across; sepals and petals lemon-yellow at back, tinted with reddish-yellow on the front; lip yellow and white, with pink and red veins and streaks, the spur 1in. long. *l.* 4ft. long. Pseudo-bulbs 9in. to 10in. high. Khasia Hills, 1895.

P. roseus (rosy). A synonym of *P. mishmensis.*

P. Sanderianus (Sander's). *fl.* more than 6in. in diameter; sepals and petals coppery-red; lip yellow at the base, crimson in the middle, white on the front lobe. This may be only a variety of *P. bicolor.*

P. S. Ralli's. A variety having sepals and petals yellow, and lip white.

P. Sieboldii. A synonym of *Calanthe striata.*

P. (Bletia) Tankervilliæ (Mrs. Tankervill's). A synonym of *P. grandifolius.*

P. Wallichii Mannii (Mann's). A large-flowered, deep-coloured variety. 1889.

P. Winnianus (Winn's).* *fl.* large; sepals and petals rosy-lilac; lip of a very deep maroon, plicate. 1895. A magnificent species. SYN. *Thunia Winniana* (L. x., t. 452).

P. Woodfordii (Woodford's). A synonym of *P. maculatus.*

Hybrids.

NAME.	PARENTAGE AND RAISER.
amabilis	*grandifolius* and *tuberculosus* (Sander).
Ashworthianus	*Wallichii* and *maculatus* (Sander).
Cooksonæ	*grandifolius* and *Humblotii* (Cookson).
Cooksonii	*Wallichii* and *tuberculosus* (Cookson).
D. S. Brown	*amabilis* and *grandifolius* (Sander).
Gravesii	*Wallichii* and *grandifolius* (Graves).
hybridus	*grandifolius* and *Wallichii* (Drewitt).
Joicyanus	*Blumei* and *amabilis* (Sander).
maculato-grandifolius..	*grandifolius* and *maculatus* (Veitch).
Marthæ.....	*Blumei* and *tuberculosus* (Sander).

FIG. 626. PHAIUS NORMAN.

Norman (see Fig. 626)..	*Sanderianus* and *tuberculosus* (Cookson).
oakwoodiense	*Cooksonii* and *Humblotii* (Cookson).
Owenianus	*bicolor* and *Humblotii* (Sander).
Phœbe	*Sanderianus* and *Humblotii* (Cookson).

FIG. 627. (A) PHALÆNOPSIS SCHILLERIANA; (B) P. STUARTIANA; (C) P. APHRODITE.

PHALÆNOPSIS. Including *Stauroglottis*. Of this large and showy genus some of the finest species at the present time are *P. Aphrodite*, *P. Schilleriana*, and *P. Stuartiana* (Fig. 627). To the species and varieties described on pp. 91-3, Vol. III., the following should be added:

P. amabilis (lovely), of gardens. A synonym of *P. Aphrodite*.

P. antennifera is now regarded as identical with *P. Esmeralda*.

P. Aphrodite Dayana (Day's). *fl.* very large; lower sepals dotted carmine over half their surface; side lobes of the lip deep yellow at the lower edge, the middle lobe trowel-shaped or hastate, marked carmine-crimson across the base, and striped carmine-crimson down the centre. Eastern Archipelago. SYN. *P. amabilis Dayana* (W. O. A. i. 11).

P. A. gloriosa (glorious).* *fl.* very conspicuous, set closely, and much resembling those of *P. amabilis*. *l.* broad at apex, light green on both sides, slightly silvered on the upper surface. Sulu Archipelago, 1888.

P. Buyssoniana (Comte F. du Buysson's). *fl.*, sepals and petals bright purple, the lateral sepals bordered inside with white; lip bright scarlet, the side lobes ochraceous outside, with scarlet lines. Cochin China, 1888. Very similar to *P. Regnieriana*, but brighter in colour, and having the median processes on the stalk of the lip filiform-linear instead of triangular.

P. Denisiana (F. Denis's). *fl.* nearly 2in. across, about a dozen on a stout peduncle 1ft. or more in length; sepals and petals greenish-yellow, with brownish-red spots; lip white, with purple and yellow markings. *l.* 1ft. long, 4in. broad, broadly oblong, deep green. Philippine Islands, 1899.

P. denticulata (slightly-toothed). *fl.*, sepals and petals white, spotted brown, cuneate-ligulate, acute; lip white, three-parted, the side partitions ligulate, light yellow on the anterior side, the median one cuneate-oblong-ligulate, acutish, with three mauve lines on either side. December. *l.* 6in. to 7in. long, 2in. to 3in. wide, green. 1888. Allied to *P. sumatrana*.

P. equestris (equine). A synonym of *P. rosea*.

P. Esmeralda candidula (whitish). *fl.* white, having the lip streaked and flushed with rosy-purple. Cambodia, 1890. A pretty variety. (L. vi., t. 263.)

P. fasciata (banded). *fl.* light yellow; lip having the crest and part of the front lobe orange, the front part of the lobe being light purple. Philippine Islands, 1882. Allied to *P. sumatrana*.

P. Foerstermanii (Foersterman's). *fl.*, ground-colour white; sepals and petals cuneate-lanceolate, marked with thin, forked, or hieroglyphic brown, transverse lines; lateral laciniæ of the lip scimitar-shaped, retuse, recurved, with a retrorse bristle, and an oblique keel outside, a yellow callus on the inner side of each, the middle lacinia tridentate at apex; peduncle two-edged. *l.* cuneate-obovate, unequally bidentate at apex. 1887.

Phalænopsis—*continued*.

P. fugax (fugacious). A synonym of *Sarcochilus unguiculatus*.

P. grandiflora (large-flowered). A synonym of *P. amabilis*.

P. Kimballiana (Kimball's). A form of *P. sumatrana*.

P. Lindeni (Linden's). *fl.* closely resembling those of *P. rosea*, but much larger. *l.* somewhat like those of *P. Schilleriana*. Habitat not recorded, 1895.

P. Lobbii (Lobb's). A synonym of *P. intermedia*.

P. Luddemanniana hieroglyphica (hieroglyph-marked). *fl.*, sepals and petals ochre-white, narrower than in the type, with cinnamon, hieroglyphic markings; side laciniæ of lip very short, the middle one cuneate, narrow, with an unusually developed keel. *l.* 7in. to 8in. long, 2in. wide. 1887.

P. L. ochracea (ochreous). *fl.*, sepals and petals pale yellowish-rose, barred pale brown. Philippine Islands. (R. H. 1872, 390.)

P. maculata (spotted). *fl.* small; sepals and petals pallid, with a few purplish-brown blotches; lip having a fleshy, semi-terete central lobe, a yellow callus, a purple anterior border, and numerous small spots. Borneo, 1881. A diminutive plant.

P. Micholitzi (Micholitz'). *fl.* creamy-white, disposed in short spikes; lip having a central raised ridge of hairs. Philippine Islands, 1890. This species is something in the way of *P. tetraspis*, and chiefly of botanical interest.

P. Regnieriana (Regnier's). *fl.* rose-coloured, with a lip that is nearly wholly dark purple, and a dark purple column; side laciniæ of the lip small, triangular, the middle one much larger, oblong-lanceolate, apiculate, thickened beneath; peduncles nine- to twelve-flowered. *l.* very thick, tapering. Siam, 1887. Allied to *P. Esmeralda*.

P. rosea leucaspis (white-shielded). *fl.* somewhat smaller than in the type, with shorter and broader segments; sepals pale rose-purple, mottled with white; petals and lip of a deeper colour; callus whitish, with yellowish-brown dots. Philippine Islands, 1848.

P. Ruckerianum (Rucker's). A garden synonym of *Sarcochilus unguiculatus*.

P. Sanderiana. There are several colour-varieties of this species, including *alba* and *punctata*.

P. Schilleriana alba (white). *fl.* white, with the exception of the yellow crest, and a few yellow spots on the upper portion of the lip. 1882.

P. S. major (greater). A large variety of the type.

P. S. purpurea (purple). *fl.* deep rose-purple, with a shade of blue, compact. 1892.

P. S. vestalis (vestal).* *fl.* white. Philippine Islands.

P. Stuartiana Hrubyana (Hruby's). *fl.*, sepals and petals purple at back, the upper sepal narrowly, the petals broadly, margined white, the inner border of the lateral sepals also white.

P. S. nobilis (noble). *fl.* longer in its parts than in the type; callus of the lip orange. 1882.

P. S. punctatissima (much-dotted). *fl.*, upper sepal, and upper and inner sides of the lateral ones, and petals dotted with mauve. 1882.

P. sumatrana Kimballiana (Kimball's).* *fl.*, sepals and petals bright yellow, barred with chestnut-red; lip ochraceous, with an orange tubercle on each side. 1883. A distinct and handsome variety.

P. violacea Bowringiana (Bowring's). *fl.* pure, light yellow, with a broad dash of purple inside the lateral sepals, and some purple bands and freckles at the bases of the upper sepal and petals. Malayan Archipelago.

P. v. Schröderi (Baron Schröder's).* *fl.* larger and finer as to colour than in the type; sepals and petals wholly purple, broad; lip of a deeper amethyst-purple than in the type; raceme short, erect. *l.* bright green. 1882.

P. Wightii (Wight's). A synonym of *Doritis Wightii*.

Phalænopsis—*continued.*

Hybrids.

NAME.	PARENTAGE AND RAISER.
Amphitrite	*Sanderiana* and *Stuartiana* (Sander).
Ariadne	*Stuartiana* and *Aphrodite* (Veitch).
Artemis	*amabilis* and *rosea* (Veitch).
Cassandra	*rosea* and *Stuartiana* (Veitch).
F. L. Ames	*amabilis* and *intermedia* (Veitch).
Harrietæ	*amabilis* and *violacea* (Veitch).
Hebe	*Sanderiana* and *ros a* (Veitch)
Hermoine	*Stuartiana* and *Luddemanniana* (Veitch).
intermedia	*Aphrodite* and *rosea* (Veitch).
John Seden	*amabilis* and *Luddemanniana* (Veitch).
Lady Rothschild	*intermedia Portcii* and *Sanderiana* (Low).
Leda	
Ludde-violacea	*violaceum* and *Luddemanniana* (Veitch).
Mrs. J. H. Veitch	*Luddemanniana* and *Sanderiana* (Veitch).
Rothschildiana	*Schilleriana* and *amabilis* (Veitch).
Schroderæ	*eucorhoda* and *intermedia Portcii* (Low).
Stuartiana-Mannii	*Stuartiana* and *Mannii* (Veitch).
vesta	*Aphrodite* and *rosea leucaspis* (Veitch).
Wiganiæ	*Schilleriana* and *Stuartiana* (Low).

Natural Hybrids.

NAME.	PARENTAGE.
alcicornus	*Schilleriana* and *amabilis.*
casta	Syn. *leucorhoda.*
delicata	*intermedia* and *rosea.*
intermedia	*Aphrodite* and *rosea.*
intermedia Brymeriana	*Aphrodite* and *rosea.*
intermedia Portcii	*Aphrodite* and *rosea.*
leucorhoda casta (see Fig. 628)	*Aphrodite* and *Schilleriana.*
speciosa†	*Luddemanniana* and *tetraspis.*
Valentini	*cornu-cervi* and *violacea.*
Veitchiana	*Schilleriana* and *rosea.*

† *P. speciosa* is described by Reichenbach as a supposed natural hybrid, but it is very questionable, and will no doubt prove a true species.

PHALANGIUM POMERIDIANUM. A synonym of **Chlorogalum pomeridianum** (which *see*). *P. Liliastrum* is identical with **Paradisia Liliastrum.**

PHALERIA. To the species described on p. 93, Vol. III., the following should be added:

P. ambigua (ambiguous). *fl.* pure white or faintly flushed with yellow, Daphne-like, very fragrant, ¾in. long and broad, twelve to fifteen in axillary and sub-terminal heads. May. *l.* 4in. to 5in. long, elliptic, cuspidate-acuminate, acute at base, light green above, paler beneath. Java, 1894. A climbing, glabrous, stove shrub. (B. M. 7471.)

PHALEROCARPUS. A synonym of **Chiogenes** (which *see*).

PHALOCALLIS. Included under **Cypella** (which *see*).

PHASEOLUS. To the species described on p. 94, Vol. III., the following should be added:

P. derasus (scraped off). *fl.* greenish-white, in pedunculate, few-flowered racemes; standard concave, shorter than the wings. *fr.* linear-oblong; seeds black, with a white scar. *l.*, leaflets ovate, acuminate. Brazil, 1833. Stove twining annual.

P. lunatus (moon-shaped). *fl.* greenish-yellow, small; racemes lax, 6in. long, the lower fascicles distant. *fr.* oblong, recurved, two- to four-seeded, 2in. to 3in. long. *l.*, leaflets ovate, acuminate. Native country uncertain; everywhere cultivated in the tropics. Stove twining annual.

P. perennis (perennial). *fl.* purple; racemes lax, 4in. to 12in. long. July and August. *l.*, leaflets ovate, acuminate, 2in. to 4in. long, the terminal one usually sub-cordate, the lateral ones inequilateral. Stems 4ft. to 10ft. long, climbing or trailing. North America, 1824. Hardy perennial.

PHAYLOPSIS (from *phaulos*, worthless, and *opsis*, appearance). SYNS. *Ætheilema*, *Micranthus* (of Wendland). ORD. *Acanthaceæ*. A genus embracing a dozen species of small, stove or greenhouse shrubs, allied to *Dædalacanthus*, natives of tropical and South Africa, the Mascarene Islands, and India. *P. parviflora* (SYN. *P. longifolia*, of Sims, B. M. 2433) has been introduced, but is probably lost to cultivation.

FIG. 628. PHALÆNOPSIS LEUCORHODA CASTA.

PHEGOPTERIS VILLOSA. A synonym of **Nephrodium pubescens** (which *see*).

PHELYPÆA is the correct spelling of **Phelipæa** (which *see*).

PHENOGAMOUS. *See* **Phænogamous.**

PHILADELPHUS. To the species, &c., described on p. 95, Vol. III., the following should be added. In this genus, however, as in many others, hybrids have been introduced which are far superior to the typical plants.

P. californicus (Californian). A synonym of *P. Gordonianus.*

P. coronarius Keteleeri flore-pleno (double-flowered).* A beautiful, double-flowered variety.

P. c. verrucosus (warted). *fl.*, calyx and peduncle warted. *l.* elliptic-ovate, acuminate, pubescent beneath and warted on the nerves. *h.* 6ft. to 9ft. North America, 1812.

P. c. Zeyheri (Zeyher's). This differs from the type in having larger but less numerous flowers, and in having the leaves rounded at base.

P. Coulteri (Coulter's). *fl.* white, solitary, about 1in. in diameter. *l.* ovate-lanceolate, serrated, whitish-pubescent on the lower surface. Branches slender, drooping. Northern Mexico, 1833. Half-hardy shrub. (G. & F. 1833, p. 232, *f.* 40.)

P. Falconeri (Falconer's). This is apparently merely a form of *P. coronarius* with narrow, elongated petals. (G. & F. 1895, f. 68.)

P. floribundus (abundant-flowered). A synonym of *P. grandiflorus.*

P. latifolius (broad-leaved). A synonym of *P grandiflorus.*

Philadelphus—*continued.*

P. mexicanus (Mexican).* *fl.* white, solitary or ternate at the tips of the branchlets; calyx densely pubescent. June and July. *l.* ovate, very acute, acuminate, remotely and argutely denticulate or entire, slightly hairy beneath. Branches lax, dependent, pubescent. Mexico, 1839 and 1898. Half-hardy. (B. M. 7600.)

P. microphyllus erectus (erect). A more erect plant than the type.

P. Satzumi is a variety of *P. coronarius.*

P. tomentosus (downy). *fl.* white, in terminal racemes; calyx lobes ovate, acute; pedicels opposite. *l.* ovate, acute, denticulate, tomentose beneath. *h.* 3ft. to 6ft. India, 1822.

P. triflorus (three-flowered). A synonym of *P. coronarius.*

P. verrucosus (warted). A form of *P. coronarius.*

P. Zeyheri (Zeyher's). A form of *P. coronarius.*

Hybrids. The best of these are: Lemoinei (between *P. microphyllus* and *P. coronarius*), and the forms Boule d'Argent, Candelabre, Gerbe de Neige, Manteau d'Hermine, and Mont Blanc.

PHILESIA. *P. magellanica* is the correct name of *P. buxifolia.*

PHILIBERTIA. *P. grandiflora* is now regarded as a form of *P. gracilis.*

PHILLYREA. *P. decora* is the correct name of *P. Vilmoriniana.* SYN. *P. laurifolia* (of gardens).

PHILODENDRON. To the species described on pp. 96-8, Vol. III., the following should be added:

P. albo-vaginatum (white-sheathed). A form of *P. lacerum.*

P. amazonicum (Amazon). A synonym of *P. laciniosum.*

P. ambiguum (ambiguous). A synonym of *P. Ochrostemon.*

FIG. 629. PHILODENDRON ANDREANUM.

P. Andreanum (André's).* *l.* pendulous, 2ft. to 3ft. long, 10in. broad, elongate-cordate-lanceolate, acute, dark, shining green, with coppery reflections. Colombia, 1886. A fine climber. See Fig. 629, for which we are indebted to Messrs. James Veitch and Sons. (R. H. 1886, p. 36.)

Philodendron—*continued.*

P. asperatum (rough). *fl.*, spathe reddish, very long, subulate-cuspidate; spadix shortly stalked; peduncle short. *l.* cordiform-ovate; petioles semi-terete. Stems climbing, with short internodes. Bahia.

P. Augustinum (Augustine's). *fl.* unknown. *l.* about 1½ft. in diameter, with a deep basal sinus, very broadly opening, pinnatisect or almost bipinnatisect, with seven to ten pairs of segments; petioles rather longer than the leaves, with minute spots. Stem rather thick, with long internodes.

P. bipennifolium (double feather-leaved). A synonym of *P. panduræforme.*

P. callæfolium (Calla-leaved). A garden synonym of *P. Imbé.*

P. Corsinianum (Corsini's). A garden hybrid; parentage not recorded. 1888.

P. crinitum (hairy). A synonym of *P. squamiferum.*

P. cuspidatum (cusp-pointed). A synonym of *P. scandens.*

P. Devansayanum (Devansay's).* *l.* cordate, blood-red when young, glossy green when adult. Stems red, climbing. Upper Peru, 1895. (I. H. 1895, pp. 187, 376, t. 48.)

P. dilaceratum (twice-torn). A synonym of *Rhaphidophora decursiva.*

P. disparile (different). *fl.*, spathe tube yellowish-green, the limb cream-colour, rather longer than the tube; peduncle shorter than the spathe. *l.* broadly triangular-cordate-sagittate, rather longer than the petioles. Bahia, 1860.

P. dolosum (false). *fl.*, spathe tube ovoid, rather shorter than the long-cuspidate, ovate limb; peduncle short. *l.* of a pleasing, shining green, cordate or ovate-triangular, narrowed towards the acuminate apex; petioles shortly sheathing, semi-terete, densely warted. Bahia.

P. Eichleri (Eichler's). This is described as a stately species, allied to *P. Selloum.* Brazil, 1899.

P. elegans (elegant). This is described as "a climbing species, with pinnatifid leaves." 1881.

P. elongatum (elongated). *fl.*, spathe tube yellowish-green, rather shorter than the yellowish-white, shortly apiculate blade; spadix oblique, stipitate; peduncle shorter than the spathe. *l.* elongated-hastate-oblong, rounded or sub-obtuse, with a broadly-opening sinus; petioles about equalling or longer than the leaves. Stem climbing. Brazil.

P. eximium (choice).* *fl.*, spathe tube green, the limb white within, shortly apiculate; spadix narrow-cylindrical; bracts whitish. *l.* of a pleasing, shining green, broadly ovate-cordate, rounded or shortly cuspidate at apex; petioles sheathing on young plants. Stem climbing, with rather long internodes. Brazil.

P. hederaceum (Ivy-like). *fl.*, spathe very large, ovate, acute, coloured inside to the base; spadix rounded. *l.* cordate-oblong, acuminate, entire, shining green; petioles rounded. Stem climbing. Martinique.

P. Hookeri (Hooker's). A species very closely related to *P. grandifolium*; indeed, Engler classes it as merely a form of that species. Demerara. (B. M. 3345, under name of *Caladium grandifolium.*)

P. Imbé (native name). *fl.*, spathe evolute nearly to the base, the tube green outside, reddish within, the limb dirty yellow, broadly ovate; peduncle short. *l.* ovate or oblong, deeply cordate at base, the basilar lobes rounded, acuminate at apex. Stem and branchlets rusty-purplish, the former emitting long aerial roots. Rio de Janeiro. SYN. *P. callæfolium* (of gardens).

P. imperialis (imperial). *fl.*, spathe green and cream-coloured. Bahia, 1860. A plant very closely allied to *P. asperatum* (Engler regards it as synonymous with that species).

P. i. Lauchcanum (Lauche's). *l.* ovate-cordate, 6in. to 9in. long, bright green, heavily mottled with grey. 1897.

P. Karstenianum (Karsten's). *fl.*, spathe green, whitish inside, 2½in. long, gaping, subulate. *l.* oblong-ovate or almost oblong, shortly cuspidate at apex, rounded or very shortly sub-cuneate at base, 4in. to 8in. long; petioles 4in. to 6in. long, with a rather broad sheath. Internodes short. Venezuela.

P. lacerum (torn). *fl.*, spathe linear-lanceolate, 4in. to 5in. long, the tube purplish within, the limb sulphur; peduncles 1ft. long. *l.*, primary ones ovate-lanceolate, entire, the later ones deeply incised-crenate, decply sinuate at base, 8in. long; petioles terete, 14in. long. Stem climbing. Jamaica.

P. l. albo-vaginatum (white-sheathed). *l.* having the lobes or segments longer than in the type (1½in. to 3in.), and the sheaths white. Jamaica.

P. laciniosum (torn). The correct name of *P. laciniatum.* SYNS. *P. amazonicum, P. pedatum, P. quercifolium.*

P. latifolium (broad-leaved). *l.* oblong-ovate, 6in. long, 4in. broad, borne on petioles about 8in. long; anterior lobe three or four times as long as the posterior ones. Caracas.

P. Martineti (Martinet's). *l.* large, sagittate, dark green above, purplish on the under-surface. 1895. This species bears some resemblance to *P. Melinoni.*

Philodendron—*continued.*

P. micans (glittering). This plant is closely allied to *P. scandens*; in fact, Engler regards it as synonymous with that species. Colombia.

P. nobile (noble).* *fl.* axillary; tube of the spathe rosy-crimson both outside and within; limb white within, the outside spotted with deep rose. *l.* obovate-lanceolate, acute. Stem climbing. South America, 1885. This resembles *P. crassinervium*, but is larger.

P. notabile (notable). *l.* deep green, cordate, 2ft. long, lobed, borne on long petioles. Stem short. Habitat not recorded, 1893. A plant of large dimensions; but until it flowers the name cannot be determined with certainty.

P. Ochrostemon (yellow-stamened). *fl.*, spathe tube scarcely distinct, green, the limb yellow, cuspidate-acuminate; peduncle short. *fr.* yellow. *l.* on young plants narrow- or elongated-lanceolate, very long-acuminate, those on adults ovate or oblong-ovate, rounded at base, shortly cuspidate at apex; sheaths rather broad. Internodes rather long. Rio de Janeiro. SYN. *P. ambiguum*.

P. ornatum (ornamental). *fl.*, spathe tube sub-cylindrical, twice as long as the ovate, very long-cuspidate limb; peduncle short, white-striolate. *l.* shining green, cordate-ovate-triangular or broadly ovate-cordate, shortly cuspidate at apex; petioles shortly sheathing, semi-terete. Internodes short. Brazil.

P. oxycardium (sharply heart-shaped). A synonym of *P. scandens*.

P. panduræforme (fiddle-shaped). *fl.*, spathe yellowish-white, almost wholly convolute, acute; peduncles short, two or three from one axil. *l.* pale green, variable; lower ones oblong, slightly cordate; upper ones panduræform; uppermost ones hastate, three- to five-lobed or parted, the terminal lobe long-cuspidate. Stem climbing; internodes long. Brazil. SYN. *P. bipennifolium*.

P. pedatum (pedate). A synonym of *P. laciniosum*.

P. pinnatifidum-Wendlandii (hybrid). A garden hybrid between the species indicated. 1899.

P. quercifolium (Oak-leaved). A synonym of *P. laciniosum*.

P. robustum (robust). This is described in Linden's catalogue as a species of extraordinary vigour, with large leaves of an emerald-green colour. 1896.

P. rubro-punctatum (red-dotted). A synonym of *P. pinnatifidum rubro-punctatum*.

P. sagittifolium (arrow-leaved). *fl.*, spathe 4in. long, the oblong, acute limb whitish; peduncle 3in. to 4in. long. *l.* 16in. to 20in. long, 6in. to 8in. broad, oblong-sagittate, sub-coriaceous. Stem erect-climbing; upper internodes 1½in. to 2in. long. South Mexico.

P. scandens (climbing). *l.*, young ones oblong-ovate, slightly cordate, long-acuminate, glittering-silky above, reddish beneath; adults rounded-cordate-ovate or somewhat triangular, distinctly cordate at base, cuspidate-acuminate at apex. Internodes very long. Vera Cruz and Panama. SYNS. *P. cuspidatum*, *P. oxycardium*.

P. Sellowianum (Sellow's). A synonym of *P. Selloum*.

P. spectabile (remarkable). This is described as a large, soft-wooded plant of vigorous habit, remarkable for its velvety or silky leaves 1ft. to 1½ft. long and nearly as broad. 1869.

P. squamiferum (scale-bearing). *fl.*, spathe 3½in. to 4in. long, the tube reddish-purple, the limb pale greenish-yellow and reddish-purple outside, whitish-yellow within; spadix oblique, sessile, 3in. long; peduncles twin, reddish, 3in. long. *l.* 6in. to 12in. long, 5in. to 10in. broad, pinnatifidly five-lobed; young ones entire or three-lobed; petioles 6in. to 12in. long, ¼in. thick, terete, reddish, densely bristly. Stem smooth. Brazil and Guiana, 1835. (I. H. 1836, 590.) SYN. *P. crinitum*.

P. tripartitum (thrice-parted). *fl.*, spathe tube oblong, the blade whitish, ovate, shortly acuminate, 4in. long; peduncle solitary, 1in. long. *l.* tripartite, 6in. to 7in. long, the mid-division shortly cuspidate, the lateral ones very inequilateral and rather obtuse; petioles 1½in. long, terete. Stem radicant. Caracas.

P. triumphans (triumphant). This species is somewhat similar to *P. verrucosum*, but it is a stronger grower, bearing leaves twice as large. 1898.

P. Wendlandii (Wendland's). *fl.*, spathe oblong-lanceolate, 6in. long, the tube about equalling the blade. *l.* 1ft. or more in length, rather thick, shining above, slightly cuspidate at apex, minutely cordately auricled at base; petioles 4in. to 5in. long. Stem very short, thick. Central America.

P. hastatum, *P. Pearcei*, *P. Roezlii*, and *P. Wallisii* have also been introduced.

PHILOPODIUM RIGIDUM. A garden synonym of **Muehlenbeckia adpressa** (which *see*).

PHINÆA. According to the Kew authorities, *P. rubida* should be classed under **Niphæa** (which *see*), *P. albo-lineata* being the only species of this genus.

PHLOMIS. To the species described on pp. 99-100, Vol. III., the following should be added:

P. laciniata (torn). A synonym of *Eremostachys laciniata*.

P. Leonurus (lion's-tail). A synonym of *Leonotis Leonurus*.

P. purpurea (purple). *fl.* purplish-rose; bracts very numerous, densely imbricated. July. *l.* oblong, obtuse, crenate, truncate or sub-cordate at base, much wrinkled, villous above, white-tomentose beneath. Branches floccose-tomentose. *h.* 2ft. South Europe, 1661. Shrub.

P. Russeliana (Russel's). A synonym of *P. viscosa*.

PHLOX. To the species and varieties described on pp. 100-3, Vol. III., the following should be added:

P. acuminata (taper-pointed). A variety of *P. paniculata*.

P. adsurgens (approaching). *fl.* rose-coloured, in lax cymes; corolla tube nearly twice as long as the calyx, the lobes obovate, about five lines long. Spring and summer. *l.* ovate-lanceolate or ovate, acute, ½in. to ¾in. long. Stems diffuse and ascending, slender, 9in. or more in length. Oregon, 1888. Perennial or under-shrub. (G. & F. 1888, p. 66, f. 11.)

P. bifida (bifid). *fl.* pale violet-purple, scattered or barely cymulose; corolla lobes twice (rarely thrice) cleft to or below the middle into diverging segments. Spring. *l.* linear, 1in. or more in length, glabrous. Stems diffuse, branching, slender. *h.* 9in. Illinois, &c.

P. divaricata canadensis alba (white). A white-flowered form that is a pleasing addition.

P. Drummondii cuspidata (cuspidate). *fl.*, corolla lobes three-toothed, the middle tooth four or five times as long as the side ones. 1883. A dwarf variety. (R. G. 1264.) It is also known as *stellata*.

P. D. fimbriata (fringed). *fl.*, corolla lobes three-toothed, the middle tooth only about twice as long as the side ones. 1883. (R. G. 1264.) Also known as *laciniata*.

P. D. flore-pleno (double-flowered).* A pretty, double-flowered form. 1885. (R. G. 1886, p. 404.)

P. D. grandiflora (large-flowered). *fl.* about 1¼in. in diameter, with the petals rounded.

P. D. hortensiæflora alba (Hortensia-flowered, white).* *fl.* pure white, showy and beautiful, produced in large heads. 1882. A close-growing and compact form. (F. & P. 1882, p. 53.)

P. D. nana (dwarf). A dwarf race about 6in. high.

P. nana (dwarf). *fl.* pink, red, white, or yellow, 1in. across, scattered or somewhat corymbose; corolla lobes elliptic, entire. Spring and summer. *l.* linear, 1in. to 3in. long, spreading, those of the branches often alternate. *h.* 6in. to 9in. Texas, &c., 1888. Perennial or under-shrub; probably hardy. (G. & F. 1888, p. 413, f. 66.)

P. Stellaria (starry).* *fl.* pure white, more than 1in. across, slightly drooping, scattered, mostly long-peduncled. May and June. *l.* 1in. to 2in. long, linear, acute, rather rigid. Stems dark, wiry. Kentucky River.

P. suffruticosa (sub-shrubby). A form of *P. glaberrima*.

P. verna (spring).* *fl.* of a beautiful pink, very dark in the throat, six to eight in terminal cymes, eventually erect May to July. *l.*, radical ones rosulate, obovate, mostly sessile, hairy; cauline ones linear-lanceolate. Stems creeping. This plant, mentioned in several works as a native of North America, is given as a hybrid in the "Index Kewensis."

Varieties. The following enumeration includes some of the best varieties:

Alpine Varieties (*Subulata* Section). ALBA, ALDBOROUGHENSIS, ANNULATA, ATROPURPUREA, BRIGHTNESS, COMPACTA, G. F. WILSON, GRANDIFLORA, LILACINA, LITTLE DOT, MODEL, NEWRY SEEDLING, OCULATA, PALLIDA, STELLARIS, THE BRIDE, VIVID.

Early-flowering Varieties (*Suffruticosa* Section). A. MCKINNON, CHARLES DOWNIE, FORERUNNER, KING OF PURPLES, LADY MUSGRAVE, MRS. MILLER, PRINCESS ALEXANDRA, PURPLE EMPEROR, SNOWDON, SUNRISE, THOMAS C GLOVER, WHITE SWAN.

Late-flowering Varieties (*Decussata* Section). AVALANCHE, BEATRICE, BERANGER, BOUQUET DE ST. CYR, COQUELICOT, ECLAIREUR, ESCLARMONDE, ETNA, EUGENIE DANZANVILLIERS, EVENEMENT, FIANCÉE, IRIS, LA MATILDE, LE MAHDI, LEONARDO DA VINCI, LE SOLEIL, LE VENGEUR, LORD RALEIGH, MADAME ANTOINE DUBIS, MICHAEL CERVANTES, MISS PEMBERTON, MOLIERE, ROXELAINE, SCHLIEMANN, TORPILLEUR, WILLIAM ROBINSON.

PHŒNIX. To the species described on pp. 104-5, Vol. III., the following should be added:

P. canariensis. The correct name of *P. tenuis*. *l.* probably 20ft. long, gracefully arched. SYN. *P. Jubæ*.

P. compacta (compact). This is described as "a garden hybrid between *P. leonensis* and *P. reclinata*," but as these are identical, it must be regarded as a garden synonym of *P. reclinata*.

Phœnix—*continued.*

P. cycadifolia (Cycad-leaved). A variety of *P. dactylifera.*

P. dactylifera cycadifolia (Cycad-leaved). *l.* 5ft. to 6ft. long; pinnæ very numerous, linear. Trunk cylindrical, 2ft. thick, covered with the scars of fallen leaves, like that of a Cycad. 1879. (R. G. 1879, t. 974, under name of *P. cycadifolia.*)

P. Hanceana (Hance's). A form of *P. humilis.*

P. humilis (dwarf). *fr.* oblong; fruiting spadix long-peduncled. *l.* somewhat glaucous; leaflets scattered, interruptedly fascicled. Stems short or moderately long, tufted. India, China, &c. *P. Ouseleyana* is a form of this species.

P. h. Hanceana (Hance's). *l.* greyish-green, much resembling those of *P. dactylifera*, but shorter. South China.

P. h. Loureiri (Loureiro's). *fr.* ovoid. *l.*, leaflets often approximate, mostly falciform. Stem short. Assam, &c., 1889. SYN. *P. pusilla*, Lour.

P. h. pedunculata (long-peduncled). *fl.*, spathe 8in. long, the margin fringed. *fr.* black, small, oblong-ovoid; peduncle very long. Stem short. Western Ghats.

P. h. Rœbelini (Rœbelin's).* A dwarf variety having regularly pinnate leaves about 1ft. long, the pinnæ narrow and green. Siam, 1889. (G. & F. 1890, p. 273; G. C. 1889, ii., f. 68.)

P. hybrida (hybrid).* A hybrid between *P. dactylifera* and *P. farinifera.* The stem is short and stout, while the leaves resemble those of *P. farinifera.* The fruits, when mature, are of a glaucous-red. Greenhouse.

P. intermedia (intermediate). A garden hybrid between *P. sylvestris* and *P. reclinata.* 1883.

P. Jubæ (Juba's). A synonym of *P. canariensis.*

P. leonensis is synonymous with *P. reclinata.*

P. Loureiri (Loureiro's). A form of *P. humilis.*

P. Mariposæ (Mariposa). A hybrid or variety of *P. canariensis.*

P. melanocarpa (black-fruited). *See* under **P. senegalensis.**

P. Ouseleyana is a variety of *P. humilis.*

P. pusilla (dwarf), of Gærtner. A synonym of *P. zeylanica.*

P. pusilla (dwarf), of Lour. A synonym of *P. h. Loureiri.*

P. rupicola foliis argenteo-variegata (silvery-variegated leaved).* A beautiful variety, having leaves variegated with green and white. 1887. (I. H. ser. v. 3.)

P. senegalensis (Senegal). A variety of *P. reclinata. P. melanocarpa* is a supposed large-fruited form of *P. senegalensis*, said to have originated in a garden on the Riviera; it has black, edible fruit. (R. H. 1893, p. 563.)

P. tenuis. The correct name is *P. canariensis.*

P. Vigieri (Vigier's). A synonym of *P. canariensis.*

P. zanzibarensis (Zanzibar). A synonym of *P. reclinata.*

P. zeylanica (Cingalese). *fr.* scarlet, then dark purple, ½in. long; spadix spreading-branched. *l.* rather short; leaflets very numerous, almost equidistant, quadrifarious, bright green, rigid, 7in. to 10in. long, pungent, spreading at right angles. Stem 8ft. to 20ft. high. Ceylon. SYN. *P. pusilla* (of Gærtner).

P. andamanensis and *P. pumila* (both names of garden origin) have also been introduced, but are rare in cultivation.

PHOLIDOTA. To the species described on p. 105, Vol. III., the following should be added:

P. assamica (Assam). This is closely allied to *P. imbricata*, but differs in having nearly globose pseudo-bulbs. Assam, 1890.

P. convallarioides. Probably identical with *P. ventricosa.*

P. Lugardi (Lugard's). *fl.* white, small, shell-like, disposed in pendent racemes 6in. long. Western Birma, 1893.

P. pallida is now regarded as synonymous with *P. imbricata.*

P. repens (creeping). *fl.* flesh-pink, small, disposed in short, recurved racemes. *l.* 3in. to 4in. long, oblanceolate. Rhizome creeping. India, 1891.

P. ventricosa (swollen).* *fl.* white, Convallaria-like, forming a spike 6in. high. *l.* 1½ft. long. Java, 1889. "An interesting species. SYN. *Coelogyne ventricosa.*

The following species are also in cultivation at botanical establishments and in private collections: *P. articulata, P. chinensis, P. conchoidea*, and *P. oborata.*

PHOLIOTA ADIPOSA. *See* **Agaricus.**

PHOMA EFFUSA. *See* **Helleborus.**

PHORMIUM. This genus now embraces three species. To the species and varieties described on pp. 105-6, Vol. III., the following should be added:

P. Hookeri (Hooker's).* *fl.* on slender pedicels; sepals orange, linear-lanceolate, acute; petals green, linear-oblong, rounded and recurved at apex; filaments blood-red; scape inclined. July. *l.* ensiform, flaccid, recurved, torn at apex. *h.* 5ft. New Zealand. Hardy in favoured situations. (B. M. 6973.)

Phormium—*continued.*

P. tenax nigro-limbatum (black-bordered). *l.* glaucous-green, erect, rather broad, margined blackish-purple; the points split, both sides of each of the divided portions having the blackish-purple margin.

PHORODON HUMULI. This pest is now regarded as identical with that found upon Damsons and other Plums in early spring, and again in September, the intermediary period being passed upon the Hop. *See* **Aphides.**

PHOSPHATIC MANURES. *See* **Phosphates of Lime,** Vol. III.

PHOTINIA. *P. japonica* (SYN. *Mespilus japonica*, B. R. 365) is now classed under *Eriobotrya*, which is kept distinct. *P. glabra* is a synonym of *P. serrulata.*

PHRAGMATOBIA FULIGINOSA. *See* **Tiger Moths.**

PHRAGMITES (from *phragma*, a fence, breastwork, or screen; in allusion to the habit of the species). SYNS. *Arundo* (of Palisot de Beauvois), *Czernya.* ORD. *Gramineæ.* A small genus of tall, perennial Grasses, allied to *Arundo*, widely distributed over temperate and tropical regions. Spikelets three- to seven-flowered, in decompound panicles, not jointed on the pedicels; glumes all glabrous. Leaves long. *P. communis* (SYN. *Arundo Phragmites*), the Common or Great Reed, is a well-known British perennial, growing 5ft. to 6ft. high, with drooping panicles of purplish-brown flowers—a useful subject for the margins of lakes and ponds. There is a most beautiful variegated form of this, which should be widely known.

PHRYGANOCIDIA. A synonym of **Macfadyena** (which *see*).

PHRYNIUM. To the information given on p. 109, Vol. III., the following should be added. Several species formerly included hereunder are now referred to the genus **Calathea.**

P. capitatum (headed). *fl.* in a sessile spike 1½in. to 2in. in diameter, subtended by two or three large, ovate bracts; corolla segments purple, linear-oblong. July. *l.* oblong, 1ft. to 1½ft. long, 6in. to 8in. broad; petioles longer than the blade, that which bears the spike 2ft. to 3ft. or more in length. India, 1807.

P. Danielii (Daniel's). A synonym of *Thaumatococcus Danielii.*

P. Griffithii (Griffith's). *fl.* borne in a radical spike; peduncle 1ft. long; calyx segments white; corolla segments unequal, the upper erect, oblong, the lateral reflexed. *l.* 2ft. long, borne on petioles 3ft. to 4ft. long. Leafy stem many-leaved. India.

P. Lubbersii (Lubbers'). A synonym of *Myrosma Lubbersii.*

P. Parkeri (Parker's). A synonym of *Ischnosiphon Parkeri.*

P. sanguineum. The correct name is *Stromanthe sanguinea.*

P. unilaterale (unilateral). A synonym of *Myrosma madagascariensis.*

P. variegatum (variegated). A synonym of *Maranta arundinacea variegata.*

PHYGELIUS. According to the "Index Kewensis," this genus is monotypic (*P. capensis*).

PHYLLAGATHIS. To the species described on p. 110, Vol. III., the following should be added:

P. hirsuta (hairy). This differs from the other species in the very short, broadly-rounded calyx lobes; in the obovate, rounded petals; and in the ovary being almost entirely adherent to the calyx. Borneo, 1894. (I. H. 1894, t. 3.)

PHYLLANTHUS. Including *Emblica, Reidia*, and *Scepasma.* To the species described on pp. 110-11, Vol. III., the following should be added:

P. Chantrieri (Chantrier's). This is now regarded as identical with *P. glaucescens.*

P. elongatus (lengthened). A synonym of *P. angustifolius.*

P. epiphyllanthus (flowers upon leaves). The correct name of *P. falcatus.*

P. glaucescens (greyish). The same as *P. Chantrieri*, described in Vol. III.

P. latifolius (broad-leaved). A synonym of *P. speciosus.*

P. linearis (linear). *fl.* fascicled, minute; calyx white. Branches tardily deciduous, compressed; branchlets crowded, 1½in. to 2½in. long, distichous, linear, serrulated from the base, striate-veined. Stem 1ft. to 2ft. high. West Indies.

P. montanus (mountain-loving). *fl.*, males glomerate, with a rosy calyx; females purple, solitary. Branches persistent, cylindrical, compressed towards the top; branchlets 2in. to

Phyllanthus—*continued.*

3in. long, scattered, spathulate, repand, striate-veined. West Indies, 1820. A small tree. (B. M. 2652.)

P. pulcher (pretty). The correct name of *P. pallidifolius.*

P. roseo-pictus (rosy-painted). *l.* alternate, about 1in. long, elliptic, obtuse, variegated with crimson and white. Habitat not recorded, 1877. Probably a garden form.

P. turbinatus (turbinate). A synonym of *Breynia turbinata.*

PHYLLARTHRON. Six species are now referred to this genus. *P. Bojeranum* is the correct spelling of *P. Bojeriana.*

PHYLLERIUM VITIS. *See* **Vine—Animal Pests.**

PHYLLOBIUS OBLONGUS. *See* **Phyllobius,** Vol. III.

PHYLLOCACTUS. SYN. *Epiphyllum* (of Haworth). To the species and varieties described on pp. 112-3, Vol. III., the following should be added. Many Phyllocacti are amongst the showiest of window plants, and should be freely employed.

P. grandis (large) * *fl.* creamy-white, 1ft. long including the tube, resembling those of the night-flowering Cereus, and opening after sunset, deliciously almond-scented. Summer and autumn. Branches broad, notched. Honduras. A fine, free-flowering species.

P. Guedeneyi (Guedeney's). A garden synonym of *Phyllocactus Guedeneyi.*

P. Russelliana (Russell's). A synonym of *Epiphyllum Russellianum.*

Hybrids and Varieties. Of late years a revival in favour of these plants has set in, and some beautiful varieties have been produced by the florist. The best of these are described below:

FIG. 630. PHYLLOCACTUS J. T. PEACOCK IMPROVED.

AGATHA, rose-pink, shaded salmon; ALBUS SUPERBUS, white, with greenish-white petals; AURANTIACUS SUPERBUS, brick-red; BRILLIANT, bright scarlet; COOPERI (Syn. CRENATO-GRANDIFLORUS), creamy-white; DELICATUS, pink, suffused white, very satiny; ELATIOR, crimson-scarlet, with white filaments; ENA, orange-scarlet, tinted apricot; EPIRUS, soft pink; EURASIAN, deep scarlet, margined with purple; EXQUISITE, rose-pink; ISABEL WATSON, coral-red outside, orange-red within, and

Phyllocactus—*continued.*

margined violet-carmine; JESSICA, soft pink; J. T. PEACOCK IMPROVED (Fig. 630), brilliant rose-pink; MARSUS (Fig. 631),

FIG. 631. PHYLLOCACTUS MARSUS.

pretty salmon-rose; NIOBE, deep scarlet, with purple centre; ORION, crimson-scarlet; PLATO, bright scarlet; ROMEO, light red, edged with purple; VENUS, crimson, shaded violet.

PHYLLOCALYX. *Eugenia Selloi* is the correct name of *P. edulis.*

PHYLLOCLADUS. To the information given on pp. 113-4, Vol. III., the following should be added:

P. alpinus (alpine). According to Dr. Masters and Sir J. D. Hooker, this is merely an alpine form of *P. trichomanoides*; it is a very small and compact bush, found growing at 6000ft. elevation, and would doubtless prove hardy here.

P. asplenifolia (Spleenwort-leaved). A synonym of *P. rhomboidalis.*

P. Billardieri (La Billardiere's). A synonym of *P. rhomboidalis.*

P. trichomanoides glauca (glaucous). A synonym of *P. glaucus.*

PHYLLODOCE. This genus (p. 114, Vol. III.) is now included under **Bryanthus** (which *see*).

PHYLLOGENOUS. Growing upon leaves.

PHYLLOSTACHYS. To the species described on p. 114, Vol. III., the following should be added. For fuller information on this and other genera of Bamboos, and for cultural details, the reader is referred to Mr. A. B. Freeman-Mitford's admirable work, "The Bamboo Garden," 1896. *See also* **Bambusa.**

P. aurea (golden). Golden Bamboo. The correct name of *Bambusa aurea.* SYN. *B. sterilis.*

P. Boryana (Bory's). A variety of *P. nigra.*

P. Castillonis (Castillo's).* *l.* lanceolate, 8in. to 9in. long, tessellated, glossy green with bright orange stripes fading to creamy-white, glaucous beneath; petioles distinct. Culms 5ft. or more in height, variegated green and yellow; internodes 3in. to 4in. long; sheaths purple, tinged pinkish. Very hardy.

P. edulis (edible) A synonym of *P. mitis.*

Phyllostachys—*continued.*

P. fastuosa (proud).* *l.* bright green above, glaucous beneath, 5in. to 7in. long, ⅜in. to 1in. broad, sharply pointed at apex, constricted 1in. from the end. A beautiful, tall, spreading species.

P. flexuosa (bending). *fl.* borne on all the branches, in the place of the fallen leaves; spikes 1¼in. to 1¾in. long, consisting of eight to ten spikelets, disposed in a panicle. *l.* like those of *P. viridi-glaucescens*. Culms 6ft. or more in height. 1854. This must not be confused with *Bambusa flexuosa* (of Munro).

P. fulva (fulvous).* This species has the colouring of *P. aurea*, with the graceful habit of *P. Henonis* and *P. nigra Boryana*. 1898. (G. C. 1898, xxiv., p. 245, f. 68.)

P. Henonis.* *l.* linear-lanceolate, bright green above, 2in. to 3in. long, ⅜in. broad, tapering, tessellated, serrated on one side especially. Culms 8ft. to 14ft. high, 1½in. thick, rough; internodes 4in. to 6in. long; branches often three to a node, 6in. to 20in. long. Mr. Freeman-Mitford considers this the loveliest of all Bamboos.

P. heterocycla (various-noded). Tortoiseshell Bamboo. *l.* 2½in. to 4in. long, ⅜in. across, bright green above, glaucous beneath, minutely tessellated, serrated mostly on one side, finely pointed. Branches borne in twos and threes, one much longer than the others; lower internodes arranged alternately and partly suppressed, somewhat resembling the scales of a tortoiseshell. 1893. A curious species.

P. Kumasasa (native name). *l.* appearing as if clustered, but really borne singly, some of them 3in. long and 1in. broad, ovate, acute, rounded at base, serrated, minutely tessellated. Culms green, channelled; internodes 1in. to 2in. long, prettily zigzagged; sheaths purple, fringed with hairs; branches in threes and fours, 1in. to 1½in. long. *h.* 1½ft. to 3ft. (G. C. 1894, i., p. 45.) SYNS. *P. ruscifolia*, *P. viminalis*.

P. Marliacea (Marliac's).* *l.* variable in size, some 4½in. long, 1in. broad, lanceolate, serrated, deep green above, glaucous beneath; petioles rather long. Culms shining dark green; lower internodes 1½in. to 2in. long, the nodes well defined; branches in twos and threes, long and gracefully arching. A rather rare species.

P. Mazeli (Mazel's). A synonym of *P. Quilioi*.

P. mitis (glittering).* *l.* very beautiful, variable in length from 1in. to 6in., lanceolate, finely pointed, serrated mostly on one edge. Culms deep green, eventually yellow, shining, 20ft. to 60ft. high, growing very quickly; sheaths tessellated, brownish, spotted with purple; developed branches in twos. One of the finest of hardy Bamboos. SYN. *P. edulis*.

P. nigra Boryana (Bory's).* Culms green at first, rich yellow the second season, and blotched with purplish-brown; bud-scales pale yellowish-green. One of the finest of the hardy Bamboos.

P. n. nigro-punctata (black-dotted). Culms in the second season brown, with darker speckles all over. Taller, more free-growing, and hardier than the type. SYN. *Bambusa nigro-punctata* (of gardens).

P. nigro-punctata (black-dotted). A variety of *P. nigra*.

P. Quilioi (Admiral Du Quilio's). *l.* 2in. to 8in. long, rather broad, serrated on one or both edges, dark green often spotted with brown above, glaucous beneath; petioles rather long. Culms 18ft. or more in height, nearly 4in. thick, brilliantly polished, dark green; nodes stained with purple; sheaths pinkish-brown, mottled with purple; branches in twos. SYNS. *P. Mazeli*, *Bambusa Quilioi*.

P. ruscifolia (Ruscus-leaved). A synonym of *P. Kumasasa*.

P. sulphurea (sulphur-coloured).* This handsome, golden-stemmed species resembles *P. mitis*, but it is smaller, with more sharply-serrated leaves, and the culms are more brilliantly coloured. *h.* 15ft. or more. Not hardy. Allied to *P. mitis*. SYN. *Bambusa sulphurea*.

P. viminalis (twiggy). A synonym of *P. Kumasasa*.

P. violescens (violet). *l.* 2in. to 7in. long, lanceolate, finely pointed, dark green above, glaucous beneath. Culms at first deep violet, almost black, changing to dingy yellow or brown; sheaths purplish-brown, with a strongly-marked ligule. *h.* 15ft. or more. Not hardy. SYN. *Bambusa violescens*.

P. viridi-glaucescens (green and glaucous).* *l.* lanceolate, finely pointed, serrated mostly on one edge, 3in. to 4in. long, ⅜in. broad, bright green above, glaucous beneath. Culms 18ft. or more in height, 2in. thick, bright green, then dingy yellow, zigzagged; branches very long in proportion to the internodes, scantily leafy. Rootstock rapidly running. The best of the tall-growing ones.

PHYLLOTRETA. To this genus, dealt with in Vol. III., at least one other species must be named as being especially troublesome to gardeners. This is *P. atra*, which will attack both flowers and foliage of many well-known plants—Stocks, Virginia Stocks, and Tropæolums. The best remedy against them is that suggested under **Turnip Flea**, or **Turnip Fly.** Or quicklime and sulphur, in about equal parts, may be dusted over the foliage.

PHYLLOXERA OF THE VINE. According to the "Revue Horticole," some practical experiments have been conducted in France with a view to still further lessening the chance of attacks by this pest. All Vine shoots intended for propagating purposes are immersed in water of from 104deg. to 120deg. Fahr. This is sufficient, it is stated, to destroy eggs and insects alike.

PHYLLOXERA VASTATRIX. *See* **Grape or Vine Louse.**

PHYSALIS. To the species described on p. 115, Vol. III., the following should be added:

FIG. 632. PHYSALIS FRANCHETI.

P. Francheti (Franchet's).* *fl.*, mature calyx coral-red or tinged with orange, about 3in. long and 7in. to 8in. in circumference. *l.* very large and long-petiolate. Stem simple, glabrous. *h.* 1½ft. Japan, 1894. This species closely resembles the old *P. Alkekengi* (of which it is probably a variety), but has larger fruit. A robust grower. See Fig. 632. (G. C. 1894, xvi., pp. 434, 441, f. 57; Gn. 1896, i., 1059.)

P. prostrata (prostrate). A synonym of *Cacalus prostratus*.

PHYSIANTHUS. *See also* under **Araujia.**

PHYSIC NUT. *See* **Jatropha.**

PHYSOCARPA. Included under **Neillia** (which *see*).

PHYSOCHLAINA. *P. prealta* is the correct name of *P. grandiflora*. *P. physaloides* is now regarded as a species of *Scopolia*.

PHYSOPODA. *See* **Thrips.**

PHYSOSIPHON. To the species described on p. 116, Vol. III., the following should be added. Both are allied to *P. Loddigesii*.*

P. guatemalensis (Guatemalan). *fl.* yellow, and purple, small, racemose. *l.* oblong. Guatemala, 1891.

P. Lindleyi (Lindley's). *fl.* green, with red sepals, the whole blossom ⅜in. long; scape 4in. long. *l.* oblong, obtuse, 3in. long. Stem 2in. long. Mexico, 1893.

PHYSOSTEGIA. *P. truncata* is a synonym of **Brasoria scutellarioides** (which *see*). *P. virginiana nana* is a dwarf form with many-flowered, bright pink racemes; it is also known in gardens as *P. Regelii*. There is also a white form (*alba*).

PHYSURUS. To the species described on p. 117, Vol. III., the following should be added:

P. chinensis (Chinese). *fl.* small, numerous on short scapes. *l.* tufted, ovate, green, 4in. long. Stem short. Kwantung, China, 1896.

P. fimbrillaris (fringed).* *fl.* white; sepals marked outside by a central line of pellucid glands; lip yellow at the tip, which is delicately fringed. *l.* ovate, dark green, with silver veins. Brazil.

PHYTEUMA. To the species described on p. 118, Vol. III., the following should be added:

P. Balbisii (Balbis's). *fl.* white, in an oblong-cylindrical spike ¾in. to 1in. long. Summer. *l.* sub-entire or sharply toothed; radical ones petiolate, cordate, broadly ovate, acute; cauline ones few, sub-sessile, ovate, acuminate. Stem erect, 4in. to 6in. high. Piedmont.

P. Halleri (Haller's). *fl.* dark violet, in an ovoid-oblong head 1in. to 1½in. long, with two spreading or reflexed bracts. May. *l.*, lower ones long-petiolate, cordate-ovate, acute, doubly serrated; upper ones lanceolate, serrated. *h.* 6in. Alps, &c., 1822.

PHYTOLACCA. Including *Pircunia*. To the species described on p. 119, Vol. III., the following should be added:

P. acinosa (full of kernels). *fl.* ¼in. across; racemes 2in. to 6in. long, erect, many-flowered. *l.* elliptic-ovate or lanceolate, acuminate, 6in. to 10in. long, thinly succulent, narrowed into the stout petioles. Stems 3ft. to 5ft. high, stout, herbaceous, succulent. Temperate Himalayas, 1844. Some authorities class this as a form of *P. decandra*.

P. arborea (tree-like). A garden name for *P. dioica*.

P. decandra albo-variegata (white-variegated).* A form with variegated leaves. 1887. (R. H. 1887, p. 16, f. 2.)

P. d. luteola (yellowish). This form differs from the type in having the leaves pale yellow, striped and spotted with bright green. 1894.

P. dioica (dicecious).* *fl.* dicecious, spreading or spreading-reflexed; raceme 2in. to 3in. long, shortly pedunculate. *l.* like those of the Black Poplar (*Populus nigra*), 3in. to 7in. long, acuminate, recurved-mucronulate. Trunk 20ft. to 30ft. high. South America. SYNS. *P. arborea* (of gardens), *Pircunia dioica*.

PHYTOMYZA ILICIS. *See* **Holly-Leaf Fly.**

PHYTOPHTHORA. Spraying with Bordeaux Mixture has proved of great benefit in keeping in check that scourge of the Potato cultivator, *Phytophthora infestans*. If two sprayings were employed in conjunction with Jensen's system of moulding, and the other precautions dealt with in Vol. III. were taken, the complaints as to the ravages of the disease would be fewer. With the farmer or the cultivator on a large scale there should be no difficulty, as a suitable spraying-machine should form part of his agricultural appliances. With the labourer, allotment holder, and small gardener, the case is different, as the cost of a sprayer would have to be seriously considered. Even this, however, need not deter the practical man from applying the fungicide: on the Continent such people get over the spraying difficulty with a very primitive appliance—namely, a bundle of heather, which is dipped in the solution, to be afterwards distributed by a mere jerk of the hand. Allotment holders could also combine to obtain a sprayer, which would soon earn its cost by the improvement alike in the crop-yield and the appearance of the tubers when lifted.

PHYTOPHTHORA OMNIVORA. *See* **Fagus.**

PHYTOPTUS AVELLANÆ. *See* **Hazel-Bud Mite.**

PHYTOPTUS PYRI (Pear-Leaf Blister Mite). *See* **Pear—Insects**, Vol. III.

PHYTOPTUS RIBIS. *See* **Currant-Bud Mite.**

PIARANTHUS. *P. pullus* is now referred to *Boucerosia* as *B. mammillaris*. *P. piliferus* is a synonym of *Trichocaulon piliferum*.

PICEA. To the species and varieties described on pp. 121-3, Vol. III., the following should be added:

P. alba. Of this species there are many varieties, including *cærulea* (bluish-leaved), *echinoformis* (dwarf and bushy), *fastigiata* (pyramidal), *intermedia* (small-coned, short-leaved, glaucous-farinose), *pendula* (drooping), and *variegata* (variegated with yellowish-white).

Picea—*continued.*

P. alpestris (rock-loving). This resembles *P. excelsa*, but has the young shoots velvety, with stiffer, shorter, thicker leaves, about ½in. to ¾in. long, and more distinctly four-angled. Swiss Alps.

P. Breweriana (Brewer's). *l.* five to twelve lines long, one-half to one line broad, rounded or slightly keeled above, stomatose beneath on each side the prominent midrib, obtuse. *cones* slender, 3in. long, with thin, entire scales. Branchlets long, drooping, whip-like, puberulous. *h.* 80ft. to 90ft. North California, 1886. This tree somewhat resembles *P. excelsa*. (G. C. 1886, pp. 497-8, f. 93.)

P. cærulea (blue). A form of *P. alba*.

P. californica (Californian). A synonym of *Tsuga Pattoniana*.

P. concolor (one-coloured). A synonym of *Abies concolor*.

P. Engelmanni (of gardens). A synonym of *P. pungens*.

P. ericoides (Heath-like). *l.* short, pale green. A distinct and pretty Fir, the origin of which is unknown; it is of pyramidal outline, and forms a densely-branched, small tree, with slender branches.

P. excelsa. White Deal. The following additional varieties may be noted:

P. e. capitata (headed). A singular variety of the Spruce. "The bulk of the plant forms a globular mass, from which project, like pins from a pin-cushion, relatively long branches, each bearing a head-like mass of leaves at the top." 1889. (R. G. 1889, p. 333, f. 103.)

P. e. cincinnata (curly-headed). *l.* of a rich green. Branches horizontal; branchlets drooping. A vigorous form.

P. e. compacta (compact).* Very attractive, compact, and distinct.

P. e. diffusa (diffuse). A dwarf-growing form, well adapted for rockeries.

P. e. dumosa (bushy). A neat, much-branched, pyramidal, low tree, rather slow in growth.

P. e. mutabilis (changeable).* A handsome variety, distinguished from the type by the bright lemon-yellow tint assumed by the young growths in spring. 1887.

P. e. reflexa (reflexed). A garden variety with pendulous branches. 1890. (R. G. 1890, p. 259, f. 73.)

P. e. viminalis (twiggy). *l.* short. Branches very long, slender, flexuous, reflexed, pendent. 1889. (R. G. 1889, f. 26.)

P. e. virgata (twiggy). This is identical with the form *monstrosa*.

P. jezoensis is synonymous with *P. ajanensis*.

P. Menziesii. The correct name is *P. sitchensis*.

P. Morinda is the correct name of *P. Smithiana*.

P. nigra Doumetti (Doumett's). *l.* glaucescent, violaceous, slender, small. Branches small, numerous. A compact, conical variety.

P. n. fastigiata (pyramidal). *l.* very short. Habit pyramidal.

P. n. rubra (red). Red Spruce. This is merely a dwarf form. America, 1755. SYN. *P. rubra*.

P. obovata Schrenkiana (Schrenk's). The correct name of *P. Schrenkiana*.

P. orientalis aurea (golden).* In this fine variety the leaves close to the main stems are of a deep bronzy-green, while those elsewhere are of a bright golden hue. 1893.

P. o. nana (dwarf). A garden variety of pyramidal habit, depressed and enlarged at the base. 1891.

P. o. pygmæa (pigmy). *l.* whitish or variegated, stiff, acute.

P. Parryana (Parry's). A synonym of *P. pungens*.

P. polita (neat). The correct name of *Abies polita*.

P. pungens. Rocky Mountain Blue Spruce. "White, glabrous branchlets, stouter [than those of *P. Engelmanni*], in old specimens somewhat flattened, spiny-pointed leaves, blue in young trees and in the young growth of old trees; the cones are much longer and paler [than in *Engelmanni*], the bark thick, crooked, and greyish; leaves of seedlings somewhat denticulate" (Engelmann). A tall tree. (G. C. 1883, p. 725, f. 130; Nov. 7, 1891, pp. 547, 549.) SYNS. *P. Engelmanni* (of gardens), *P. Parryana*.

P. p. argentea (silvery). *l.* of a bright, silvery-glaucous hue. 1890.

P. p. glauca (glaucous).* A strikingly beautiful, glaucous form. See Fig. 633, for which we are indebted to Messrs. Veitch and Sons. *pendula* is a drooping form of this.

P. rubens (red). *cones* ovate-oblong, early deciduous, 1in. to 2½in. long, borne on short, incurved stalks; scales rounded. *l.* very slender, dark yellow-green, tetragonal, standing out from all sides of the branch, ½in. to ¾in. long, very lustrous at maturity. Branchlets pubescent. Bark reddish-brown. *h.* 70ft.

Picea—*continued.*

to 110ft. North America, 1755. SYNS. *Abies rubra, P. rubra, Pinus rubra.*

P. sitchensis (Sitcha). The correct name of *P. Menziesii.*

P. Smithiana. *P. Morinda* is the correct name (G. C. Sept. 26, 1885, p. 393, f. 85).

P. vulgaris (common). A synonym of *P. excelsa.*

Picotee—*continued.*

GANYMEDE, GRACE DARLING, ISABEL LAKIN, LENA, MARTIAL, MARY D. ANSTISS, MINOS, MISS MAGUIRE, MRS. LOVAT, NORMAN CARR, SOUVENIR DE HEADLAND, ZENO.

Light and Heavy Rose- and Scarlet-edged. AMY, CLIO, CORDELIA, DAISY ETHEL, DUCHESS OF YORK, LIDDINGTON'S FAVOURITE, LITTLE PHIL, MRS. FOSTER, MRS. RUDD, MRS. SHARP, NELLIE, ROSIE SYDENHAM.

FIG. 633. PICEA PUNGENS GLAUCA.

PICOTEE. The following additional varieties are among the best of recent years:

Light and Heavy Purple-edged. AMELIA, ANN LORD, ATHENE, BARONESS BURDETT COUTTS, CALYPSO, CLARA PENSON, FANNY TETT, HER MAJESTY, LAVINIA, MRS. FRED SANDER, MRS. KINGSTON, NYMPH, POLLY BRAZIL, PORTIA, SUMMERHILL, SYLVIA.

Light and Heavy Red-edged. ACME, BRUNETTE, CHARLOTTE BRONTE, DR. HORNER, EMILY, ETNA, EURIPEDES,

Yellow Ground. EMPRESS EUGENIE, HAIDEE, HYGEIA, LADAS, LADY CECIL SCOTT MONTAGUE, MAY QUEEN, MISS ALICE MILLS, MR. NIGEL, MRS. DOUGLAS, MRS. DRANFIELD, MRS ROBERT SYDENHAM, MRS. WHITBOURN, STANLEY WRIGHTSON, THE GIFT, VENUS, VIRGO, WANDERER.

PICRIDIUM (from *Picris*, and *eidos*, resemblance; in allusion to its affinity with *Picris*). SYN. *Reichardia* (of Roth, 1787). ORD. *Compositæ.* Ten species have been referred to this genus, but not more than five or six are

Picridium—*continued.*

distinct as such: they are hardy, glabrous, annual or perennial herbs, natives of South Europe, North Africa, and Western Asia. Flower-heads yellow, long-pedunculate, homogamous; involucre campanulate, the bracts in several series; florets ligulate, five-toothed at apex. Leaves radical or alternate, toothed or pinnatifid. *P. tingitanum*, probably the only species in cultivation, is a perennial. It thrives in any fairly good garden soil, and may be increased by divisions.

P. tingitanum (Tangier). *fl.-heads* on squamose peduncles; outer involucral bracts squarrose. July. *l.* all runcinate-pinnatifid, semi-amplexicaul, denticulate. Stems branched. *h.* 1½ft. Tangier, &c., 1882. SYN. *Scorzonera orientalis.*

PICTETIA. *P. squamata* is now removed to **Ormocarpum,** under the name of *O. sennoides*, with which *O. coronilloides* is synonymous.

PIERARDIA. A synonym of **Baccaurea** (which *see*).

PIERIS. To the species described on pp. 124-5, Vol. III., the following varieties should be added. *P. mariana*, *P. nitida*, and *P. ovalifolia* are poisonous to animals.

P. densiflora (dense-flowered). A form of *P. oralifolia.*

P. japonica is a variety of *P. ovalifolia*

P. j. elegantissima (most elegant).* This garden variety only differs from the typical *japonica* in having the leaves prettily margined with white. SYN. *Andromeda japonica variegata.*

PIERIS NAPI. *See* **Cabbage Caterpillars.**

PIGAFETTA. This genus is named in honour of Ant. Pigafetta, an Italian, who accompanied Magellan in his voyage round the world (1519-22), and wrote an account of it.

PIGEON'S GRASS. *See* **Verbena officinalis.**

PILEA. To the species described on p. 125, Vol. III., the following should be added:

P. Spruceana (Spruce's). *fl.* greenish-white, disposed in crowded, axillary racemes. *l.* dark bronzy-green, ovate, rugose. Peru and Venezuela, 1895. A dwarf species.

PILOCARPUS. *P. Jaborandi* (B. M. 7483) is the correct name of the plant described on p. 126, Vol. III., as *P. pennatifolius* (B. M. Pl., t. 48; f. 6-11).

PILOCEREUS. To the species described on p. 127, Vol. III., the following should be added:

P. Celsianus (Celsius'). Stem (in garden specimens) columnar, simple, pale glaucous-green, woolly towards the apex; ribs ten to seventeen, obtuse; radial prickles usually nine, rigid, subulate, straight or slightly curved, pale yellow; central ones two to four. Andes. SYNS. *P. foveolatus*, *P. Williamsii.* There are several forms of this species.

P. Forsterii (Forster's). A synonym of *P. Houlletianum.*

P. foveolatus (small-pitted). A synonym of *P. Celsianus.*

P. Hoppenstedti (Hoppenstedt's). Stems columnar, eight- to twenty-angled, the angles rounded, with deep, acute grooves between them; pulvini closely-set, white, tomentose; outer spines about twenty, unequal, the lower ones longest, greyish-white; central ones six to eight, brownish, the lower ones 2½in. long. Mexico, 1883. Stove. A curious species.

P. senilis. Young plants of this species, such as the very fine specimen shown in Fig. 634, are more conspicuously white-hairy than old ones.

P. Williamsii (Williams'). A synonym of *P. Celsianus.*

The following have been introduced, but are very rare in cultivation: *P. chrysomallus*, *P. Columna-Trajani*, *P. Marschallackianus*, and *P. tilophorus.*

PILOGYNE. A synonym of **Melothria** (which *see*).

PIMPINELLA includes *Tragium.*

PINCHING. The stopping, or Pinching, of the growing shoots of plants and fruit trees is a very important operation in determining the shape of a plant, as well as in the production of fruit on fruit-bearing trees, especially those grown under glass. Some plants would grow very tall and ugly unless the points of the shoots were removed while young, thus causing what would have otherwise been dormant buds to start into growth, and the plant to assume a much dwarfer and bushier habit. Again, it frequently occurs that a shoot will commence making strong growth, and the remaining ones on the plant scarcely move; but by timely Pinching of the gross shoot,

Pinching—*continued.*

the energy is in a great measure distributed over the weaker shoots, and the plant retains its form.

With fruit trees under glass, careful Pinching is a necessity; and to conserve energy, the Pinching should as far as possible be done by the finger and thumb while the young wood is soft. For instance, the stopping of Vine laterals and the sub-laterals is always best done as soon as they are large enough for the finger and thumb to pinch. Fig-trees are more fruitful and the produce is finer if the points of the young shoots are pinched out when four or five leaves are formed. Peaches, Nectarines, Plums, Cherries, Apples, and Pears grown in pots under glass must be judiciously "pinched" to make them bear good crops of fruit. The usual practice is to remove the points of the shoots when they have made seven or eight leaves. Wall and other trained trees, both under glass and outside, need careful attention in this respect to secure the finest results. Under glass this attention is usually given; but outside trees are permitted to make a great quantity of growth that is cut away with the pruning-knife, and much of the energy of the tree is wasted. This would be avoided if a proper regulation of the growth by Pinching were adopted, as in the case of trees grown under glass.

FIG. 634. PILOCEREUS SENILIS.

PIN-EYED. Having the style more conspicuous than the stamens. Auricula-growers regard pin-eyed specimens as worthless—such, for instance, as have the stigmatic part protruding from the eye, with the anthers placed lower down.

PIN PILLAR. *See* **Opuntia curassavica.**

PINANGA. To the species described on p. 130, Vol. III., the following should be added:

P. decora (comely). *l.* pinnate, green, tinged brown; pinnæ sessile, broadly lanceolate, long-acuminate, sometimes bifid and rounded at the apex; sheaths marked brown. Caudex tall. Borneo, 1836. Unarmed. (I. H. 1886, 114.)

P. Dicksonii (Dickson's). *fl.*, spadix branches stout, densely clothed with imbricating flowers; spathe simple. *l.* pinnate, 4ft. long, forked; leaflets numerous, sessile, 1ft. to 2ft. long, broadly linear, præmorse, the upper ones confluent. Trunk 16ft. to 18ft. high, 2in. thick. Western Ghats.

Pinanga—*continued.*

P. disticha (two-rowed). *fl.*, spadix 2in. to 3in. long, simple. *l.* 1ft. to 1½ft. long, cuneately obovate, simple and deeply forked, or with a few broad lateral, acuminate leaflets inserted by a broad base. Stems 2ft. to 6ft. high, usually tufted. Penang, &c. SYN. *Ptychosperma disticha.*

P. gracilis (slender). *fl.*, spadix white or scarlet, simple, reflexed; spathe solitary, bifid. *l.* 3ft. to 4ft. long, sparingly pinnate; leaflets inserted by a very broad base, 1ft. long or more; petiole and sheaths scurfy. Stems 6ft. to 20ft. long, ½in. to ¾in. thick, slender, usually gregarious. Sikkim, &c.

P. lepida (pretty). *l.*, when first developed, brownish-crimson, gradually changing to deep, lustrous green, with faint darker mottling; segments unequal, prominently veined above; petioles short, rufescent. East Indies, 1883. This Palm is only known in a young state in gardens.

P. paradoxa (paradoxical). *fl.*, spadix short, decurved; peduncle short. *l.* 1ft. long, entire and oblong, or having three to six pairs of sigmoidly linear-lanceolate, acuminate leaflets 4in. to 5in. long, with a broad base. Stem 3ft. to 6ft. long, ½in. in diameter. Malacca, &c.

P. Sanderiana (Sander's). *l.* two-lobed, spreading, glossy, mottled green; petioles mottled or freckled with brownish pubescence, destitute of spines. Indian Archipelago, 1885.

P. spectabilis (remarkable). *l.* dark green, with paler mottlings, silvery beneath, pinnate; young ones two-lobed. East Indies, 1886.

PINASTER. *See* **Pinus Pinaster.**

PINCENECTITIA TUBERCULATA. A synonym of **Beaucarnea recurvata,** the correct name of which is *Nolina recurvata.*

PINE BLIGHT or PINE NEEDLE CAST (*Lophodermium pinastri*). A condition due to fungus attack, and peculiar to many species of *Pinus*, the Weymouth Pine being one of those exempt. The chief symptom is indicated by the second of the names above adopted. Old trees and seedlings are alike attacked, and the latter rarely recover in bad cases. Pines affected by the fungus show brown blotches upon the leaves, while the other portion assumes a purplish tinge. Hartig suggests, as a precautionary measure, the isolation of nursery-beds from older trees. Once the tissues are attacked there is little hope of recovery. *See also* **Pinus —Fungi,** Vol. III., p. 138.

PINK. Pinks and Carnations are affected by a Rust known as **Puccinia Arenariæ** (see Vol. III.). The disease is best combated by means of a weak solution of Bordeaux Mixture directly the spotted appearance is noted on the leaves.

Varieties. These have received many additions during the last ten years or so, and some of the more noteworthy in their respective sections are here given:

Border and Forcing Pinks. ALBINO, ALICE LEE, ASCOT, BERTHA, BUEN RETIRO, CAPO DI MONTI, DRESDEN, ERNEST LADHAMS, EURYDICE, HER MAJESTY, HOMER, MRS. LAKIN, MRS. SINKINS, MRS. WELSH, PADDINGTON, PHEASANT'S EYE, SNOWFLAKE, ZURICH.

Show or Laced Pinks. BERTHA, BERTRAM, BORARD, CHANTILLY, CLARA, DEVICE, EMERALD, EMPRESS OF INDIA, EXCELLENT, GEORGE BROWN, GEORGE WHITE, HARRY HOOPER, LADY CRAVEN, MINERVA, MISS POMEROY, MRS. DARKE, MRS. WAITE, OLD CHELSEA, RELIANCE, ROYAL WORCESTER, SARA, THE RECTOR.

PINUS. To the species and varieties described on pp. 141-6, Vol. III., the following should be added. In in the enumeration will be found a few species not yet introduced to this country, but which doubtless will be in the near future, and others which will only grow in certain localities.

P. abchasica (Abchasian). A synonym of *P. halepensis.*

P. Abies (Abies). A synonym of *Abies pectinata.*

P. albicaulis (white-stemmed). *l.* entire, 2in. to 3in. long, stout, rigid, curved, keeled on the inner face, rounded on the outer. *cones* 2½in. long, ovate, rounded at base, very resinous; scales transversely keeled. Branches stout, horizontal, much twisted. *h.* 30ft. to 60ft. Mexico and California (at 8000ft. to 14,000ft.). This Alpine Tree is, it is much to be regretted, not adapted for culture in this country.

P. Alcoquiana (Alcock's). A synonym of *Picea Alcockiana.*

P. apulcensis (Apulco). *l.* in fives, slender, 6in. long, slightly curved, deep glaucous-green; sheaths long and silky. *cones* 4in. long, conical-ovate, glossy, whorled, very resinous; scales rugged, pyramidal, sometimes begked. Branches short, few, irregular, glaucous-violet on the younger parts. *h.* 45ft. to 60ft. Apulco, Mexico (on mountains), 1839.

Pinus—*continued.*

P. aristata (awned). By very many botanists this is now regarded as inseparable from *P. Balfouriana.*

P. attenuata (attenuated). A synonym of *P. tuberculata,* described in Vol. III. A species which cannot be recommended for culture here.

P. australis. The correct name is *P. palustris.*

P. austriaca is a variety of *P. Laricio.* There is a garden form *foliis-aureis,* having leaves marked with yellow. 1837.

P. Ayacahuite (native name). The correct name of *P. Buonapartea.* SYNS. *P. Dom Pedri, P. Loudoniana, P. Veitchii.*

P. Banksiana (Banks'). Gray or Northern Scrub Pine. *l.* in twos, 1in. long, elliptic, divergent, flat, very dark green. *cones* twin or rarely solitary, sessile, conical, oblong, usually curved, 1½in. to 2in. long, smooth; scales pointless. *h.* 5ft. to 20ft. United States, 1785 and 1878. A straggling shrub or tall tree. SYNS. *P. divaricata, P. Hudsonia, P. rupestris.*

P. Brutia (Brutia). A form of *P. pyrenaica.*

P. Buonapartea. The correct name is *P. Ayacahuite.*

P. canariensis (Canary Islands). *l.* in threes, triquetrous, serrulated, acute, 6in. to 8in. long; sheaths ½in. long. *cones* oblong-cylindrical, 5½in. long, straight, sessile, hard and glossy; scales 1in. broad, bluntly pointed. Branches regular; branchlets slender, drooping. *h.* 60ft. to 70ft. Mountains of Teneriffe, 1883. Rather tender. (G. C. June 9, 1883, p. 723.)

P. caramanica (Karamana). A synonym of *P. Laricio karamana.*

P. cembroides (*P. Cembra*-like). *l.* in threes or rarely in twos, 2in. to 2½in. long, sometimes incurved, bright glaucous-green, very dense, acute; sheaths very short, soon falling. *cones* 1⅜in. wide, 1in. long, sessile; scales in three rows only; seeds large, edible. Branches regularly whorled, smooth, ash-grey, horizontal. *h.* 15ft. to 20ft. Mexico, 1830. Unsuited for culture in this country except in a few favoured sites in the West. (J. H. S. i., p. 236.) SYNS. *P. Llavcana, P. osteosperma.*

P. cembroides (of Gordon). A synonym of *P. edulis.*

P. clausa (inclosed). *l.* longer and finer. *cones* nearly sessile, spreading or reflexed, mostly persistent for years. *h.* 10ft. to 40ft. Otherwise like *P. inops,* of which it was formerly classed as a variety. Southern United States, 1892. (G. & F. April 6, 1892, f. 24.)

P. cubensis (Cuban). *l.* ternate or the upper ones twin, 9in. to 10in. long, very narrow, rigid, compressed-triquetrous, mucronate; sheaths rather short, persistent. *cones* solitary or twin, ovate or ovate-conical; scales somewhat rhomboid, with a prominent, transverse keel. Southern United States and Cuba.

P. Devoniana (Duke of Devonshire's). A synonym of *P. Montezumæ.*

P. divaricata (divaricate). A synonym of *P. Banksiana.*

P. Dom Pedri is synonymous with *P. Ayacahuite.*

P. Edgariana (Edgar's). A synonym of *P. muricata.*

P. excelsa zebrina (zebra-striped). A remarkable variety, having the leaves curiously rayed with white. (R. H. 1889, f. 101.)

P. excelsa (of Hooker). A synonym of *P. Peuke.*

P. glabra (smooth). *l.* in twos, slender, scattered, 3in. to 4in. long. *cones* generally solitary, somewhat cylindrical, about 2in. long. Branches and branchlets smooth, whitish. *h.* 40ft. to 60ft. Southern United States.

P. Gordoniana (Gordon's). A synonym of *P. Montezumæ.*

P. Grenvilleæ is a form of *P. Montezumæ.*

P. Hartwegii (Hartweg's). *l.* in fives or sometimes fours, very dense, curved, dark green, 6in. long; sheaths long on the young leaves. *cones* 4in. to 5in. long, nearly 2in. broad, clustered, pendulous, oblong, tapering, deep purple at first, dark brown when adult; scales rather thin, four-sided. Branches few, robust, irregular. *h.* 40ft. to 50ft. Mexico (at 9000ft.), 1839. Fairly hardy. Closely allied to *P. oocarpa.* SYN. *P. rudis* (of Endlicher).

P. Hudsonia (Hudson's). A synonym of *P. Banksiana.*

P. inops (poor). Jersey or Scrub Pine. *l.* 1½in. to 3in. long, scattered, short, rigid, flat on the inner face; sheaths short. *cones* solitary, oblong-conical, sometimes curved, 2in. to 3in. long, light brown; scales tipped with a straight or recurved, awl-shaped prickle. Branches spreading or drooping; young shoots with a purplish-glaucous bloom. *h.* 15ft. to 40ft. North America, 1739. A straggling tree, not thriving well or for any length of time here.

P. i. clausa (inclosed). *See* **P. clausa.**

P. Jeffreyi is now regarded as a species, and not as a variety of *P. ponderosa.*

P. karamana (Karamana). A form of *P. Laricio.*

P. Khasya (Khasia). *l.* in threes, very slender, green, serrulated, 5in. to 9in. long, semi-terete, grooved above; sheaths ½in. to ¾in. long, persistent. *cones* long-pedunculate, ovoid, 2in. to 3in. long, recurved when young; tips of the scales

Pinus—*continued.*

thickened, flat or convex, transversely keeled. *h.* sometimes 200ft. (in Birma). Khasia, &c. (up to 7000ft.). Tender.

P. koraiensis variegata (variegated). In this garden form the young leaves are whitish-yellow in colour. The plant is said to be a vigorous grower. 1887.

P. Laricio. Dr. Masters groups the various forms of this species as follow: (1) *nigricans*, leaves thicker, stiffer, and brownish-green (*e.g.*, *austriaca* and *Heldreichii*); (2) *Pallasiana*, leaves stiff as in *nigricans*, but cones larger, and the surface of the scales cracked; and (3) *tenuifolia*, leaves narrow and thin (*e.g.*, *monspeliensis*, *pyrenaica*, and *Salzmanni*).

P. latifolia (broad-leaved). *l.* 1½in. to 2in. long, very slender, serrulated. *cones* ovate, sub-cylindrical, 3in. or more in length, peduncled (produced above the uppermost leaves of the season); scales chestnut-brown, shining. Mexico. SYN. *P. latisquama* (G. C. Dec. 2, 1882, p. 713, f. 125).

P. latifolia (of Sargent). A synonym of *P. ponderosa scopulorum.*

P. latisquama (broad-scaled). A synonym of *P. latifolia.*

P. leiophylla (smooth-leaved). *l.* in fives, slender, glaucous-green, 4in. to 5in. long, partly three-sided, sharp-pointed, drooping, closely set; sheaths short, shrivelled. *cones* 2½in. long, ovate, acute, flattened or depressed at base, pendulous; scales ½in. across, with a sharp point in the middle, dark. Branches slender, pendulous at the tips. *h.* 60ft. to 100ft. Mexico (up to 7000ft.). Rather tender.

P. Llaveana (Llave's). A synonym of *P. cembroides.*

P. lophosperma (crest-seeded). A synonym of *P. Torreyana.*

P. Loudoniana is synonymous with *P. Ayacahuite.*

P. macrophylla (large-leaved). A variety of *P. Montezumæ.*

P. maritima (sea-loving). A synonym of *P. halepensis.*

P. Massoniana (of S. Z. F. J.). The correct name is *P. Thunbergii.*

P. microcarpa (small-fruited). A synonym of *Larix pendula.*

P. mitis (mild, pliant). Short-leaved Pine; Yellow Pine. *l.* in twos or threes, crowded, very slender, concave on the inner face, dark green, 3in. to 5in. long; sheaths long. *cones* light brown, about 1½in. long, mostly solitary, oval or conical-oblong, opening at maturity; scales tipped with a weak prickle. *h.* 50ft. to 60ft. North America, 1739. Ill adapted for culture in Great Britain.

P. monspeliensis (Montpellier). A form of *P. Laricio.*

P. montana (mountain-loving). The correct name of *P. Mughus.*

P. Montezumæ (G. C. Oct. 25, 1890, f. 90-94). Several Pines formerly regarded as species (*P. Devoniana*, *P. Grenvillæ*, *P. macrophylla*, *P. Russelliana*) are referred hereunder as varieties, by Dr. Masters, who groups them as follow: (1) *Lindleyana*, leaves smaller and cones shorter; (2) *macrophylla*, leaves long (SYN. *P. Grenvillæ*, J. H. S. ii., 27).

P. Mughus. The correct name is *P. montana.*

P. Nuttallii (Nuttall's). A synonym of *Larix occidentalis.*

P. occidentalis (Western). West India Pine. *l.* in fives, bright green, 5in. to 6in. long, acuminate, slender but stiff, rather distant, with lanceolate scales at base ½in. long; sheaths over ½in. long, persistent. *cones* 3½in. long, somewhat pendulous, conical, rather long-stalked, covered with sharp-pointed scales. *h.* 20ft. to 30ft. St. Domingo and Cuba, 1820. Very rare in this country, and of doubtful hardiness.

P. oocarpa (egg-fruited). *l.* in fives, slender, acuminate, rather pendulous, 8in. to 10in. long, bright green, thickly set; sheaths long, persistent. *cones* solitary, ovate, tapering, 3½in. long, pale yellow, hard, shining, rather long-stalked; scales with elevated bands from centre to corners. *h.* 40ft. to 50ft. Temperate parts of Mexico, 1840. Tender.

P. osteosperma (bony-seeded). A synonym of *P. cembroides.*

P. palustris (marsh-loving). American Pitch Pine. The correct name of *P. australis.*

P. p. excelsa (tall). *l.* shorter, slenderer, and more erect. Plant hardier and more branched. Origin unknown.

P. patula (rather spreading).* *l.* in threes, fours, or fives, 7in. to 9in. long, slender, soft, spreading, deeply channelled above, convex beneath; sheaths 1½in. long. *cones* in clusters of three to five, ovate-oblong, 4in. long, obtusely pointed, pale brown, smooth, polished; scales having a small prickle in the centre when young. Branches numerous, but irregular. *h.* 60ft. to 80ft. Colder regions of Mexico (up to 9000ft.), 1835. (G. C. Jan. 24, 1885, f. 19, 20, 22.) An ornamental species.

P. p. macrocarpa (large-fruited). *cones* 6in. to 7in. long, 2in. broad. *h.* 100ft. or more. 1891. (G. C. 1891, ix., p. 435, f. 92.)

P. p. stricta (erect). *l.* shorter and stiffer than in the type, spreading. *cones* half as large. A slenderer tree.

P. pendula (drooping). A synonym of *Larix pendula.*

P. pentaphylla (five-leaved). This species has been introduced, but it is doubtful whether any specimens have survived.

Pinus—*continued.*

P. persica (Persian). *l.* in twos, 2in. to 5in. long, deep green, twisted, tufted at the tips of the branches, channelled inside, convex outside, finely serrated. *cones* clustered, 5in. long, ovate, tapering, greyish-brown, hard, smooth. Branches regular, short, slender, mostly pointing upwards. South of Persia. A large tree.

P. Peuke (Greek for Pine Tree). *l.* in fives, 3½in. to 4in. long, three-edged, bright green, with slight glaucous bands, very narrow, stiff, acuminate. *cones* yellowish-brown, cylindrical, slightly tapering, obtuse at both ends, 3in. to 4in. long, with seven or eight rows of scales. Branches spreading, thickly furnished with laterals. *h.* 30ft. to 40ft. Mountains of Macedonia and Roumelia, &c., 1864 (up to 6000ft.). SYN. *P. excelsa*, of Hooker (J. L. S. xxii., p. 205). Of slow growth, but of robust constitution.

P. Pinaster major (larger). *l.* stout, channelled, 8in. to 10in. long, dark green. *cones* solitary, 8in. to 10in. long. A very large tree, with strong, spreading branches.

P. P. minor (smaller). Cortean Pine. *l.* smaller than in the type. *cones* smaller, sometimes produced in large clusters of more than 100.

P. P. prolifera (proliferous). *cones* small, disposed in dense fascicles.

P. Pinceana (Pince's).* *l.* in threes or twos, 3in. to 4in. long, very slender, three-edged, straight; sheaths soon falling. *cones* 3in. to 3½in. long, conical, obtuse, glossy brown, on rather stout stalks. Branches long, slender, flexible, pendulous; branchlets slender, long, drooping. *h.* 60ft. Mexico (up to 9000ft.). A very handsome, weeping tree.

P. Pithyusa (Pithyusa). A synonym of *P. halepensis.*

P. ponderosa. The variety *scopulorum* (*P. latifolia*, of Sargent), besides being a smaller tree, has shorter leaves and smaller cones. Rocky Mountains, 1838.

P. pseudo-Strobus (false *Strobus*). *l.* in fives, 8in. to 10in. long, very slender, glaucous, rather pendulous; sheaths 1in. long, composed of jagged scales. *cones* whorled, 5in. to 6in. long, conical, slightly curved; scales rhomboid, with a sharp point in the centre. Branches diverging from the main trunk at right angles (as in *P. Strobus*), with numerous slender branchlets. *h.* 90ft. to 100ft. Mexico (up to 10,000ft.). Tender.

P. pseudo-Tæda (false *Tæda*). *l.* 4in. to 6in. long, slender, rigid; sheaths fringed, ¼in. long. *cones* solitary, ovate, 2in. long; scales depressed, with an awn one line long. Only known as a garden plant.

P. radiata. This is the correct name of the plant described as *P. insignis.*

P. resinosa (resinous). Red Pine. *l.* in twos, 5in. to 6in. long, dark green, slender, straight, yellowish-green, thickly set on the shoots; sheaths nearly 1in. long, white with age. *cones* terminal, ovate-conical, smooth, about 2in. long; scales slightly thickened, pointless. Branches whorled, reddish-brown. *h.* 70ft. to 80ft. United States, 1756. The wood is compact and durable, but not very resinous. SYN. *P. rubra.* Unsuited generally for culture in this country.

P. rigida serotina (late-fruiting). A variety with longer leaves and more elongated cones, often remaining closed for years.

P. rubra (red). A synonym of *P. resinosa.*

P. rudis (rude), of Endlicher. A synonym of *P. Hartwegii.*

P. rupestris (rock-loving). A synonym of *P. Banksiana.*

P. Russelliana (Duke of Bedford's). A synonym of *P. Montezumæ.*

P. Salzmanni (Salzmann's). A form of *P. Laricio.*

P. sinensis (Chinese). A synonym of *P. Massoniana.*

P. Strobus. Of this species there are a number of varieties, including *aurea*, *compacta nana*, *nivea*, and *variegata.*

P. sylvestris aurea (golden).* *l.* pale green, becoming rich yellow in winter. A very attractive, slow-growing variety; it prefers an open situation and a rather dry soil.

P. s. columnare compacta (columnar, compact). A garden variety, of a dense, flame-like outline, resembling *P. cembra* in a young state; it is slow-growing. 1889. (R. H. 1889, p. 393, f. 101.)

P. s. globosa (globular). A small, very compact, much-branched tree, with glaucous leaves; it is distinct and very slow in growth.

P. tabulæformis (table-like). A form of *P. Thunbergii.*

P. Tæda (torches). Frankincense, Loblolly, Old-field, or Torch Pine. *l.* in threes, or rarely twos or fours, slender, 6in. to 10in. long, pale green, rigid, blunt, channelled on the inner side; sheaths 1in. long, nearly smooth, whitish when young. *cones* solitary, 3in. to 5in. long, oblong-conical; scales armed with a short, rigid, straight spine. Branches scaly, spreading, dense. *h.* 80ft. United States (in damp soil), where the timber is used for torches, 1713.

P. Teocote (candle-wood). *l.* in threes, 3in. to 5in. long, compressed, erect, rigid, acuminate, light green, channelled on the inner side, convex below; sheaths 1in. long. *cones* ovate-

Pinus—*continued.*

oblong, 2½in. long, tapering, smooth, drooping, on rather long stalks. Branches rather stiff, very leafy. *h.* 100ft. Mexico (up to 8000ft.), 1839.

P. Thunbergi (Thunberg's).* The correct name of *P. Massoniana* (of Endlicher, not of Lambert). In the form *variegata* the lower part of the leaves is marked with yellow. *tabulæformis* is a dwarf kind, with strong branches. Fairly hardy, and a good seaside tree.

P. Torreyana (Torrey's). *l.* in fives, 8in. to 10in. long, stout, stiff, pungent-pointed, three-edged; sheaths ½in. to more than 1in. long. *cones* 4½in. to 5½in. long, globular or obtusely ovate, much resembling those of *P. Pinea*; seeds very large, with a thick crest. Shoots very stout, white-powdery or glaucous when young. Lower California, 1860. SYN. *P. lophosperma.*

P. uncinata (hooked). A synonym of *P. montana.*

P. Veitchii (Veitch's). A synonym of *P. Ayacahuite.*

FIG. 635. PIPTANTHUS NEPALENSIS.

PIP. A common name for an Apple, Orange, and other seed; it is also applied by Auricula cultivators to the individual flowers in a truss.

PIPER. To the species described on pp. 147-8, Vol. III., the following should be added:

P. metallicum (metallic).* *l.* thick, round, of a beautiful metallic green. Borneo, 1882. Stove.

P. ornatum (ornamental).* *l.* peltate, ovate-orbicular, shortly pointed, 2½in. to 5in. long, 2in. to 4in. broad, bright green, marked with pink spots. Celebes, 1834. Stove.

P. rubro-venosum (red-veined). *l.* alternate, cordate, acuminate, bright green, entire, highly glabrous, five-nerved; nerves marked on the upper surface by irregular lines of rose-colour; stipules adnate to the petioles. 1886. According to N. E. Brown, this is scarcely distinct from *M. ornatum.* Stove. (I. H. 1886, 33.)

PIPERIDGE. Another name for the Barberry. *See* **Berberis.**

PIPES. A word generally applied by gardeners to those Pipes employed for heating purposes, but also embracing those for draining, water, gas, and other purposes. The hot-water Pipes for heating glass or other structures are usually made in 9ft. lengths, with collars fitted with india-rubber or other bands for connecting to each other, and the necessary bends, elbows, T-pieces, &c., too numerous to name. The sizes of the Pipes vary from a diameter of 1in. upwards. Practice, however, has proved that a 4in. Pipe is the most useful size for general purposes about the body of the house; and a 2in. Pipe to run on the roof, near the ventilators, to warm the external air as it goes into the structure. In laying or fixing hot-water Pipes, there should always be a slight ascent to the highest point direct from the boiler, with no dip or depression anywhere. As a rule, the sharper the ascent the quicker the flow of the hot-water through the Pipes.

PIPINGS. The cuttings of Carnations, Picotees, and Pinks are usually termed Pipings, and are made of the current year's growth. Pipings are about 5in. long, and the leaves are removed from the lower halves; they are then inserted in firm, sandy soil in pots, pans, cold frames, or under hand-lights, keeping them rather close for a few weeks, by which time they will have made roots. Afterwards they are gradually hardened by exposure.

PIPTADENIA. *P. guianensis* is a synonym of **Stryphnodendron guianense** (which *see*).

PIPTANTHUS. To the species described on p. 148, Vol. III., the following should be added:

P. nepalensis aureus (golden). This only differs from the type in having the bark striped yellow and green. 1879. See Fig. 635. SYN. *Thermopsis nepalensis aureus.*

P. tomentosus (downy). This resembles *P. nepalensis*, but is clothed in all its parts with silky tomentum. Yunnan, China, 1887.

PIPTOSPATHA. This genus now embraces four species, and is distinguished by the nodding spathe, the limb of which is calyptrately deciduous from the tube, the latter forming a funnel-shaped cup round the fruiting spadix. To the species described on p. 148, Vol. III., the following should be added:

P. Ridleyi (Ridley's).* *fl.*, spathe dull green at base, pink above, with darker nerves and dots, closed except at the apex, completely hiding the spadix. June. *l.* erect, 6in. to 8in. long, 2in. broad, elliptic-lanceolate, acute at both ends, green, with irregular yellowish blotches. Malay Peninsula, 1893. (B. M. 7410.)

PIRATINERA. A synonym of **Brosimum** (which *see*).

PIRCUNIA. Included under **Phytolacca** (which *see*).

PIRUS. *See* **Pyrus.**

PISHAMIN, SWEET. *See* **Carpodinus.**

PISONIA. According to the Kew authorities, *P. grandis* is the correct name of *P. inermis.*

PISTOL-PLANT. *See* **Pilea microphylla.**

PIT. *See* **Pits.**

PITCAIRNIA. To the species described on pp. 150-1, Vol. III., the following should be added:

P. arcuata (arched). *fl.* 3in. long; sepals carmine and yellow; petals pale yellow; bracts lanceolate, brownish-red on the lower part of the stem, bright carmine on the narrow-cylindric spike. *l.* petiolate, lanceolate, acute, 2½ft. to 3ft. long, 3in. to 4in. broad; petioles spiny. Stem arching, as long as the leaves. Colombia, 1882. SYN. *Newmannia arcuata* (R. H. 1886, p. 108).

P. cœrulea (blue). The correct name of *Puya cœrulea.*

P. Darblayana (D'Arblay's). *fl.* in a loose panicle; sepals brick-red; petals bright red. 1888. A garden hybrid, closely allied to *P. Maroni.* (R. H. 1890, f. 10, 11.)

P. excelsa (tall). A synonym of *P. pulverulenta.*

P. floccosa (woolly). *fl.*, petals blue, half as long again as the calyx; panicle lax, with numerous ascending, spicate branches, densely white-floccose; peduncle as long as the leaves. *l.* about 100 in a dense rosette, ensiform, acuminate, 2½ft. to 3ft. long, 1in. broad, armed with hooked prickles. Venezuela, 1847.

P. jaliscana.* *fl.* in a simple raceme 3in. to 4in. long, shortly pedicellate; petals bright red. *l.* linear, 6in. long, green, stiffly hairy on the margins. North Mexico, 1888. Plant stemless. (R. G. 1892, f. 77.) An attractive kind that will doubtless be introduced.

P. Klabochorum (Klaboch's). A tall, copiously-panicled species, allied to *P. pulverulenta.*

P. latifolia. *P. furfuracea* is a variety of this species.

P. Maroni (Maron's). A hybrid between *P. corallina* and *P. Altensteinii.* 1884.

P. megastachya (large-spiked). *fl.* sub-sessile; calyx pale rose, downy; corolla peacock-blue, tubular, 1½in. long; panicle 2½ft. high, downy; peduncle shorter than the leaves. *l.* numerous, thick, coriaceous, arching, 2ft. to 2½ft. long, 2in. to 2½in. broad, shining green above, covered with white felt beneath, the margins spiny. Andes of Peru, 1873. SYN. *Puya Raezli.*

P. nigra (black).* *fl.* violet, long, subtended by large, recurving, rich coral-red bracts; raceme dense, erect, 1ft. long; sepals 1in. long; petals 2½in. long; peduncle stout, erect, 6in. to 9in. long. *l.* 9in. to 12in. long, petiolate, oblong-elliptic, acute, green. Ecuador, 1833. A handsome and very distinct plant. SYN. *Newmannia nigra* (R. H. 1831, p. 390).

Pitcairnia—*continued.*

P. Palmeri (Palmer's). *fl.*, petals bright red, 1¼in. long; raceme simple, secund; peduncle very short, with slender, subulate leaves. *l.* few, linear, chartaceous, 6in. long, ¼in. broad, those on the barren shoots sparsely hairy, those on the flowering shoot barbed. Mexico, 1838. (G. & F. 1888, p. 211, f. 38.)

P. Roëzlii (Roëzl's). *fl.*, sepals coral-red; petals cinnabar-red, thrice as long as the sepals, connivent in a helmet; bracts downy. November. *l.* long-lanceolate, ascending, arcuate, sessile, furfuresent on both sides, channelled, unarmed. Stems red. Andes of Peru, 1885. Plant tufted. (B. H. 1885, p. 283, tt. 18-19.)

P. violacea (violet).* *fl.* deep violet, 2in. long, with yellow anthers; inflorescence lax, with horizontally spreading branches 6in. to 14in. long, borne on a stem 6ft. high. *l.* long, narrow, recurving, glaucous, spiny-margined. Mexico (?), 1880.

P. virescens. The correct name is *Caraguata virescens.*

P. Whytei (Whyte's). A synonym of *P. cærulea.*

P. zeifolia (Zea-leaved). J. G. Baker regards this as synonymous with *P. maidifolia.* SYN. *Vriesia tricolor* (of gardens).

P. Lindeni, P. lutea, and *P. Morelii* have also been introduced to Continental gardens.

PITCH PINE. *See* **Pinus palustris** and **P. rigida.**

PITCHER-PLANT. *See also* **Sarracenia.**

PITCHER-SHAPED. Tubular, with a contracted throat.

PITHECOCTENIUM. To the species described on p. 152, Vol. III., the following should be added:

P. buccinatorium (trumpet-like). A synonym of *Bignonia buccinatoria.*

P. Catharinæ (St. Catharine's). The correct name of *P. Carolinæ.*

P. clematideum (Clematis-like).* *fl.* white, with a yellow throat, showy, trumpet-shaped, in large, terminal racemes. *l.* ending in a tendril, with two ovate, acuminate leaflets, or sometimes with three leaflets and no tendril. Stems slender. Argentina, 1890. SYN. *Anemopæyma clematideum.*

PITTOSPORUM. Including *Senacia.* To the species described on pp. 153-4, Vol. III., the following should be added:

P. angustifolium (narrow-leaved). A synonym of *P. phillyræoides.*

P. capense (Cape). A synonym of *P. viridiflorum.*

P. criocarpum (woolly-fruited).* *fl.* golden-yellow, fragrant, ½in. long, disposed in compound, many-flowered, often umbellate corymbs; peduncles 1in. to 2in. long. *l.* ovate to broadly lanceolate, 3in. to 8in. long, shortly stalked, downy beneath when adult. Western Himalayas, 1896. A small, greenhouse tree. (B. M. 7473.)

P. eugenioides variegatum (variegated). *l.* elliptic-oblong, pale green, bordered white. Stems and branches blackish-purple. New Zealand, 1882. Greenhouse, evergreen shrub.

P. flavum (yellow). A synonym of *Hymenosporum flavum.*

P. phillyræoides (Phillyræa-like).* *fl.* yellow, ½in. across; pedicels axillary, solitary or in clusters or umbels. *l.* oblong-lanceolate to linear, quite entire, 2in. to 4in. long, with a small, hooked point. Australia, 1823 and 1883. A graceful, greenhouse shrub or small tree. SYN. *P. angustifolium* (L. B. C., t. 1859).

P. resiniferum (resin-bearing). *fr.* ovoid-compressed. *l.* at first white-woolly, eventually becoming glabrous. Branches blackish, glabrous. Philippine Islands, 1894.

P. rhytidocarpum (wrinkled-fruited).* *fl.* white, disposed in terminal, crowded umbels. *l.* obovate or oblanceolate, shortly acuminate. Fiji, 1887. A pretty and useful, greenhouse shrub.

PITYROSPERMA. Included under **Cimicifuga** (which *see*), the correct name of *P. acerinum* being *C. japonicum.*

PLAGIANTHUS. *P. Lampenii* is a form of *P. sidoides.* *P. Lyallii* is now regarded as a species of *Gaya,* a genus not otherwise represented in gardens.

PLAGIOBOTRYS NOTHOFULVUS. *See* **Eritrichium nothofulvum.**

PLANARIAN WORM (*Bipolium kewense*). A species of Worm occasionally found in glass-houses. It is flat, thin, and smooth, and is thought to be a useful creature, feeding upon insects, worms, and millipedes. In Orchid collections it has been found more than once in this country.

PLANERA. One or two species formerly included hereunder are now referred to **Zelkova** (which *see*).

PLANERA (of Giseke). A synonym of **Costus** (which *see*).

PLANK-PLANT. *See* **Bossiæa scolopendria.**

PLANT. An organised being endowed with life, and very occasionally with the power of motion (as in Insectivorous and Climbing Plants and in Zoospores). When complete they have a root, stem, and leaves, or less often a single leafy expansion, a series of cellules, or even a single cellule. Further, they are divided into flowering (Phanerogamous) and flowerless (Cryptogamous). The former have flowers and seeds; but the latter depend for their reproduction upon minute one-celled spores.

PLANTAGO. To the species described on p. 155, Vol. III., the following should be added:

P. coriacea (leathery). The correct name of *P. brasiliensis.*

P. lanceolata marginata (margined). *fl.*, stem crowned with a tuft of oblong-lanceolate leaves, spotted with white. *l.* bordered with white and marked with glaucous stripes, three- to five-ribbed, erect or spreading. France, 1839. An abnormal form; it may be increased by division.

P. macrophylla purpurea (large-leaved, purple). A large, purple-leaved variety of the British *P. major* (Greater Plantain). 1878

P. uniflora (one-flowered). *fl.*, scape slender, as long as the leaves, one-flowered, hairy. *l.* few, ½in. to 1½in. long, narrow-lanceolate, sinuate-toothed or entire, variegated, villous at base. Stems ½in. high only. New Zealand, 1899.

PLANT BUGS. *See* **Insects—Heteroptera.**

PLASHING. This is really an intertwining of growths. When Thorn or other hedges become too tall or bare at the base, they are strengthened and made almost impenetrable to animals by bending down the growths and cutting them about half-way through at the base, and twining them among stout stakes. These stakes are about 4ft. apart, and are known as live and dead stakes. The live stake is an upright growth cut off at the proper height in the fence, and the dead stake is one that is made and driven into the soil.

PLASMODIOPHORA BRASSICÆ. *See* **Finger-and-Toe, Clubbing,** or **Anbury.**

PLASMOPARA VITICOLA. *See* **Vine Fungi.**

PLATANUS. To the species, &c., described on p. 156, Vol. III., the following varieties should be added. According to the Kew list, *P. acerifolia* and *P. cuneata* now rank as species and not as forms of *P. orientalis.*

P. acerifolia Süttneri (Süttner's).* *l.* deeply cut, pale green, beautifully marbled and striped with creamy-white. A hardy and vigorous variety, with constant variegation.

P. occidentalis cucullata (hooded). *l.* small, roundish, nearly entire or slightly lobulate, somewhat cucullate. 1877. A curious variety. There are several variegated forms of *P. occidentalis,* that known as *P. o. argenteo-variegatis* being very ornamental.

PLATYCAPNOS. Included under **Fumaria** (which *see*).

PLATYCERIUM. Elk's-horn and Stag's-horn Ferns. With the exception of *P. alcicorne,* which thrives best in an ordinary greenhouse temperature, all Platyceriums require stove treatment. They succeed best and become most effective when planted in the fork of an ordinary tree-branch or in an artificial wall-pocket made of virgin cork. *P. alcicorne* also has a most pleasing appearance when grown as a basket-plant, as its roots, which usually produce young plants on their surface, soon make a perfect ball, imparting a singular effect, growing as it does in all directions—sideways, head downwards, &c.—with equal vigour. The best compost is a mixture, in about equal parts, of rough, fibrous peat and sphagnum. The plants are particularly fond of strong light, and should receive water at the roots with moderation. The best way to keep them in good condition in that respect is to soak them thoroughly, and then to wait until the foliage begins to droop and to present a soft, withered aspect before soaking them again.

Platyceriums are usually propagated by means of young plants produced from the adventitious buds on their roots. *P. grande,* however, has never been known to produce any, and consequently it must be propagated by means of spores; this method, though somewhat slow, is also resorted to for other species when required in great quantities.

Platycerium—*continued.*

To the species and varieties described on pp. 157-8, Vol. III., the following should be added:

P. alcicorne majus.* In this variety, which requires a warmer temperature than the species, the foliage is much larger and the plant is of a much more robust habit. See Fig. 636, for which we are indebted to Messrs. James Veitch and Sons.

FIG. 636. PLATYCERIUM ALCICORNE MAJUS.

P. angolense. This is now regarded as a distinct species and not as a variety of *P. æthiopicum.*

P. Killii. According to the Kew authorities, this is merely a variety of *P. alcicorne.*

P. Veitchii (Veitch's). This is described as of stout, erect growth, the fronds being of an unusually leathery substance and dark green. Habitat not recorded, 1896.

PLATYCLINIS. With the exception of *P. filiformis*, all the remaining species are best suited for pot or pan culture. The best of these is *P. glumaceum.* Its free habit, good constitution, and highly fragrant flowers render it one of the most useful and attractive of the winter-flowering Orchids. The flowers are produced from the centre of the newly-developing growths when the foliage has advanced to about 6in. in length. One raceme of its highly fragrant flowers is sufficient to perfume a good-sized greenhouse.

The best season to repot these plants is when the young roots are being emitted from the base of the young growths. The pots should be drained to within a few inches of the rim, and over the material should be placed a layer of sphagnum, finishing off with good fibrous peat and moss in equal proportions, and pressing moderately firm about the base of the bulbs. It is advisable to mass a quantity of plants together in one pot if an effective display is to be produced. As soon as active growth commences, they should be assigned a light position in the warmest house. They require a liberal amount of water during the growing season, but as soon as the bulbs have become matured, cooler and drier conditions should be afforded, only sufficient moisture being supplied to keep them in a normal condition.

To the species described on p. 158, Vol. III., the following should be added:

P. cucumerina (cucumber-like). *fl.* light, pellucid green, arranged in a graceful, distichous raceme; lip with a toothed, brown auricle on each side of the base, running out into a narrow, aristate process; middle lobe obcuneate, retuse, apiculate, with two brown stripes on the disk. *l.* shining. Pseudo-bulbs cucumber-like, at length furrowed, tufted. Philippines, 1885. SYN. *Dendrochilum cucumerinum.*

P. rufa (reddish). *fl.* reddish-brown; scapes 6in. long, many-flowered. *l.* linear, acute, 10in. long. Pseudo-bulbs tufted, egg-shaped, ½in. long. Habitat not recorded, 1898. Allied to *P. uncata.*

P. uncata (hooked).* *fl.* pale green, larger; sepals and petals acute; racemes drooping, shorter. Otherwise resembling

Platyclinis—*continued.*

P. filiformis. Malay Archipelago, 1897. SYN. *Dendrochilum uncatum.*

P. latifolia (SYN. *Dendrochilum latifolium*) and one or two other species are in cultivation in the collections of specialists as well as at Kew.

PLATYCODON. Chinese Balloon Flower. There are now white-flowered and semi-double forms of *P. grandiflorum.* The names *P. autumnale* and *P. chinense* are applied to the more robust forms.

PLATYLOBIUM. Several species formerly included hereunder are now referred to **Bossiæa.** *P. lanceolatum* and *P. ovatum* are synonyms of *B. heterophylla.*

PLATYPUS CYLINDRUS. *See* **Oak—Insect Pests.**

PLATYSACE. The correct name of **Siebera** (which *see*). SYN. *Fischera* (of Sprengel).

PLATYSMA. A synonym of **Podochilus** (which *see*).

PLATYSTACHYS. Included under **Tillandsia** (which *see*).

PLECTOCOMIA. To the species described on p. 160, Vol. III., the following should be added. Plectocomias requires a hot, moist stove.

P. crinita (hairy). *l.* pinnate, very large, glaucous-green, whitish on the under-surface; petioles armed with white spines in fascicles of about six. Habitat not recorded, 1896.

P. Griffithii (Griffith's). *fl.*, male spikelets sessile; females pedicellate. *fr.* three to five in each spathel; spadix branches 2ft. to 3ft. long; spathels 1¾in. broad. *l.* (with the flagellum) about 20ft. long; leaflets distant, 2ft. to 3ft. long, 2in. to 3in. broad, decurved, glaucous beneath. Stem as thick as a man's leg. Malacca. A gigantic species.

P. khasyana (Khasia Hills). The correct name of the *P. assamica* of Hooker (B. M. 5105) described in Vol. III.

P. spectabilis has also been introduced, but is at present rare in cultivation.

PLECTRANTHUS. To the species described on p. 160, Vol. III., the following should be added. All require greenhouse treatment.

P. cylindraceus (cylindrical). *fl.* lilac; racemes spike-like, branched, 2½in. long. *l.* small, ovate, crenate, cuneate at base, white-woolly, the upper ones 1in. long. *h.* 1ft. Abyssinia, 1894. A somewhat succulent under-shrub.

P. hadiensis. *fl.* lilac-purple, spotted. *l.* cordate, borne on short petioles, doubly serrated. Abyssinia, 1894. A prostrate, much-branched bush.

P. herbaceus (herbaceous). *fl.* lilac. *l.* cordate, toothed, borne on long petioles. Abyssinia, 1894. An erect herb.

P. marrubioides (Marrubium-like) *fl.* white, very small, in dense clusters, forming interrupted spikes 6in. long. *l.* small, obovate-cuneate, elliptic, or ovate-oblong, crenate, thick, fleshy. Stems erect, thick, villous. Abyssinia, 1894. A curious shrub (?).

P. Schweinfurthi (Schweinfurth's). *fl.* blue, small, disposed in dense, many-flowered whorls. *l.* stalked, ovate, toothed. Arabia, 1894. A dense, dwarf bush.

PLECTRITIS. The compilers of the "Index Kewensis" include this genus under *Valerianella.*

PLEIONEMA. A corruption of the word **Pleroma** (which *see*).

PLERANDRA (from *pleres*, full, and *aner*, *andros*, a male; in allusion to the numerous stamens). Including *Bakeria* (of Seemann) and *Nesopanax.* ORD. *Araliaceæ.* A small genus (four species) of stove, unarmed, glabrous trees, natives of Fiji. Flowers polygamous (?); calyx entire or sinuate-toothed; petals five, valvate, calyptrate, cohering or rarely free; stamens numerous, in two or several series; umbellets pedunculate. Fruit often rather large. Leaves ample, digitately compound; leaflets coriaceous, entire. Only two species have been introduced. For culture, *see* **Trevesia.**

P. Græffei. *See* **P. Grayi.**

P. Grayi (Asa Gray's). *fl.* greenish; umbellets twenty-six-flowered; umbels many-rayed. *fr.* ¾in. long, ¼in. in diameter. *l.* digitate; leaflets nine, obovate-oblong, obtuse, attenuated to the petioles, the upper ones 6in. to 7in. long and 2½in. broad. 1887. Wrongly called *P. Græffei.*

P. vitiensis (Fijian). *fl.* green, disposed in compound umbels 9in. to 12in. across. *l.* digitate; leaflets five to ten, petiolate, elliptic-obovate, blunt at apex. Stem unbranched. 1887. A small tree. SYNS. *Bakeria vitiensis, Nesopanax vitiensis.*

PLEROMA. According to the Kew authorities, *Tibouchina* is now the correct name of this genus, most of the specific names remaining unchanged. To the species described on p. 162, Vol. III., the following should be added. *See also* **Chætogastra.**

P. macranthum is a form of *P. semidecandrum.*

P. marmoratum (marbled). *fl.* bluish-purple, large. *l.* ovate, dark green, blotched with cream-colour. Habitat not recorded (probably a garden variety), 1884. A bushy shrub.

P. meiodon (smaller-toothed). *fl.* purple, disposed in pedunculate cymes; corolla ½in. in diameter. *l.* ovate, 1in. long. *h.* 6ft. Brazil, 1895. A loose shrub.

P. villosum. The correct name is *Melastoma villosum.*

PLEUROCOCCUS VULGARIS. *See* **Pinus—Fungi.**

PLEUROTHALLIS. To the species described on p. 163, Vol. III., the following should be added, but as stated in Vol. III., the species generally are of little horticultural value.

P. atropurpurea (dark purple). The correct name of this plant is *Cryptophoranthus atropurpureus.*

P. Autraniana (Autran's). *fl.* light yellow, spotted and striped with purplish-brown, disposed in racemes. Habitat not recorded, 1895. Allied to *P. longissima.*

P. aviceps. The correct name is *Masdevallia aviceps.*

P. coccinea (scarlet). A synonym of *Rodriguezia secunda.*

P. convergens (converging). *fl.* white, fragrant, disposed in racemes. Brazil, 1899. Plant tufted.

P. foliosa (leafy). A synonym of *Gomeza foliosa.*

P. gelida (ice-like). *fl.* creamy-white or greenish-white, in racemes somewhat resembling a Lily of the Valley. Summer. *l.* stout, oblong, deep green. *h.* 1ft. Jamaica, 1841.

P. glanduligera (gland-bearing). *fl.* pale yellow, small, streaked with green and reddish-purple, about a dozen on a slender scape 6in. long. Summer. *l.* small, ovate, fleshy. Brazil.

P. glossopogon (bearded-tongued). A garden synonym of *P. insignis.*

P. immersa (immersed). *fl.* rich claret or purplish, disposed in a pendulous raceme; peduncle tightly embraced in the hollow of the lower end of the leaf (hence the specific name). *l.* 3in. to 6in. long, obovate, obtuse. Colombia, 1891. (B. M. 7189.)

P. inflata (inflated). *fl.* whitish, solitary. *l.* 6in. long, 1in. broad. Stems 6in. long. Colombia, 1894.

P. insignis (remarkable).* *fl.* pale, pellucid whitish-green, 2¾in. long; upper sepal with three dull purple stripes, long-attenuate above, the lower connate pair having three dull purple stripes near the margin; petals with a broad base, bristle-like above; central lobe of lip dark blackish-purple, ligulate, villous at apex, the side ones half as long, falcate-linear; peduncle two-flowered. *l.* sessile, oblong or linear-oblong, 3¾in. long. Colombia, 1879. (B. M. 6936.) SYN. *P. glossopogon* (of gardens).

P. Krænzlini (Krænzlin's). *fl.* purple and silvery-white. Habitat not recorded, 1894. A singular little species.

P. lamprophyllum (shining-leaved). *fl.* pale straw-yellow, deliciously scented; racemes long, erect, many-flowered, produced from the tops of the stems. Central America.

P. lepanthiformis (Lepanthes-like). A synonym of *P. villosa.*

P. Leucopyramis (white-pyramid). *fl.* milk-white, small, freely produced. Autumn. *l.* linear-ligulate, 2in. to 3in. long. Stems 2in. to 3in. high, clothed with dark brown sheaths. Probably Costa Rica. (R. X. O. iii., t. 210, f. 1-9.)

P. liparauges (bright-beaming). *fl.* light reddish-ochre, pellucid, remarkably thin; sepals linear; petals nearly so, but broader at the base; lip light ochre, with an orange margin at the apex, oblong, blunt-acute, rounded at base; column green, semi-terete, with angular wings. *l.* petiolate, oblong, blunt-acute, the upper surface spotted mauve-purple, the lower nearly wholly mauve. Brazil, 1885. A small species.

P. longissima (very long). *fl.* white, tinged with yellow, disposed in a dense, one-sided raceme; scape slender, erect, upwards of 1ft. in length. Spring. *l.* solitary, oblong, 5in. long, 1in. broad, thick, fleshy, deep green. Stem slender. West Indies. (H. E. F. ii., t. 123; L. B. C., t. 949.) SYN. *P. racemiflora.*

P. macroblepharis (large-fringed). *fl.* resembling those of *P. Barberiana*, but with narrowly acicular petals and a flat, hairy lip. *l.* longer and more acute than those of the species just alluded to. Peru. SYN. *Masdevallia Culex.*

P. maculata (spotted). A synonym of *Cryptophoranthus maculatus.*

P. ophiocephala. A synonym of *Restrepia ophiocephala.*

P. ornata (ornamental). *fl.* pale purplish-brown, less than ½in. across; margins of the sepals densely fringed with white tendrils, which are agitated by the slightest touch or draught. *l.* about 1in. long. Colombia, 1890. (B. M. 7094.)

Pleurothallis—*continued.*

P. pergracilis (very slender). *fl.* yellowish, very small, with purple lines; scapes 4in. high. *l.* small, spathulate, densely tufted. British Honduras, 1893.

P. pernambucensis (Pernambuco). *fl.* green and purple, small; raceme ½in. long, six-flowered. *l.* oblong, 1in. long. Brazil, 1894.

P. platyrachis (broad-rachised). *fl.* golden-yellow; lip having a deep central band with an elevated ochreous ridge on each side; raceme 1in. to 1½in. long, six- to ten-flowered, the rachis stout. October. *l.* 5in. to 6in. long, 1in. broad. Costa Rica, 1884. (B. M. 7129.) SYN. *Masdevallia platyrachis.*

P. platystachys (broad-spiked). *fl.* green, dotted with purple, small, disposed in a compressed spike; scape as long as the leaves, with about four bracts. *l.* lanceolate, bidentate at apex. Brazil, 1888. Plant tufted.

P. puberula (slightly downy). *fl.* green and dull yellow, fragrant, small, numerous. Habitat not recorded, 1893.

P. punctulata (slightly dotted).* *fl.* 1¾in. across; sepals and petals light yellow, spotted with purplish-brown; lateral sepals connate into a concave, oblong body, only the points being free; lip deep maroon, papillose above. *l.* lanceolate-oblong, 3in. to 3½in. long, very stiff and leathery. Stems about 2in. high. Colombia, 1885. A handsome species.

P. pyrsodes (torch-like). *fl.* orange-coloured, solitary. *l.* stout, very short-stalked, numerous. Central America, 1876.

P. racemiflora (raceme-flowered). A synonym of *P. longissima.*

P. Raymondii is the proper spelling of *P. Reymondii.*

P. Regeliana (Regel's). *fl.* gaping; dorsal sepal ochreous, erect; lateral ones reddish, declinate, connate; petals whitish; lip rose-coloured, with some purple marks at base, unguiculate, oblong-ligulate; bracts ochreous; peduncle short, recurved. *l.* very coriaceous, rounded at base, oblong or ovate-oblong, the apex slightly emarginate. Stem climbing. Minas Geraes, Brazil, 1886. (R. G. 1886, p. 51.)

P. rhombipetala (rhomboid-petaled). *fl.* green and purple, small, disposed in loose racemes. Mount Roraima, British Guiana, 1893.

P. Roezlii (Roëzl's).* *fl.* of a deep blood-purple, partly expanded, five or six in a one-sided raceme; sepals 1¼in. long, the lateral ones connate into an ovate blade; lip tongue-shaped. Spring. *l.* oblong-lanceolate, 5in. to 8in. long, light grass-green. Stems erect, 3in. to 6in. high, with pale brown sheaths. Colombia, 1885. An attractive species.

P. rotundifolia (round-leaved). *fl.* yellow and purple, borne on short scapes. *l.* orbicular, ½in. long. Jamaica, 1895.

P. rufa (reddish). *fl.* dull brownish-red, with a purple lip, small; raceme short, fleshy. *l.* fleshy, 4in. long. Stems 4in. long. Mexico, 1898.

P. stenosepala (narrow-sepaled). *fl.*, sepals and petals light green; lip of a light brownish-buff shade.

P. teretifolia (terete-leaved). *fl.* brown, fleshy, disposed in slender, pendulous racemes. *l.* narrow, terete, forming a tuft 9in. high. Brazil, 1892.

P. tribuloides (Tribulus-like). *fl.* brick-red, very small, numerous. *h.* about 2in. Jamaica, 1887. An inconspicuous species.

P. unistriata (once-striated). *fl.* whitish, lined with purple, small, few on a slender scape 2½in. long. *l.* 1in. long. Habitat not recorded, 1893.

P. villosa (villous). *fl.* purple, small. *l.* narrow-oblong-lanceolate, petiolate, twice as long as the raceme. *h.* 4in. Mexico, 1894. SYN. *P. lepanthiformis.*

PLOCOGLOTTIS. To the species described on p. 164, Vol. III., the following should be added:

P. acuminata (taper-pointed). *fl.* 1in. across; dorsal sepal erect, the lateral ones finely acuminate; lip quadrate, with rounded angles; raceme very lax, simple or branched; scape 10in. or more in length. *l.* solitary, 10in. to 12in. long, elliptic-lanceolate. Perak, Java, &c.

P. javanica (Javanese). *fl.* pale yellow, speckled with red, ⅝in. across; dorsal sepal arched, the lateral ones and the petals falcate; lip broadly obovate, with rounded angles and tip; raceme 8in. to 10in. long; scape much longer than the leaf. *l.* solitary, 10in. to 12in. long, 3in. to 4in. broad. Java.

PLOCOSTIGMA. A synonym of **Podochilus** (which *see*).

PLOWRIGHTIA MORBOSA. *See* **Black Knot.**

PLOWRIGHTIA (SCLERODERRIS) RIBESIA. *See* **Gooseberry Fungi.**

PLUCHEA. To the species described on p. 164, Vol. III., the following should be added:

P. subdecurrens (somewhat decurrent). *fl.-heads* yellow, pedicellate, many in a terminal corymb. August and September. *l.* decurrent, lanceolate-linear, acute. Stems shrubby, erect, terete. *h.* 2ft. Mexico. Greenhouse shrub. SYNS. *Baccharis adnata, Conyza asteroides.*

PLUM. To the list of varieties on pp. 165-6, Vol. III., the following should be added:

Archduke. Fruit large, oval, purple, and very handsome. End of September or early October. Equally fine for cooking, dessert, or preserving. A comparatively new variety, raised by Mr. Rivers, and a valuable sort for both private and market growers, owing to its lateness.

Belle de Louvain. Fruit very large, oval, reddish-purple, covered with a good bloom; flesh yellow and clinging to the stone. Middle of August. A splendid variety for cooking or preserving. Tree a most abundant bearer.

Brahy's Green Gage. Fruit medium, roundish-oval; skin yellow, with a delicate bloom; flesh of the most delicious Gage flavour. End of July. A productive variety.

Burbank. Fruit large, oval, yellow, with red spots, and agreeable flavour. A Japanese variety, with foliage somewhat like the Peach. Excellent in pots or under glass, but doubtful outside in this country.

Gisborne's. Fruit medium, roundish-oval; skin a beautiful amber colour when fully ripe; flesh solid, juicy, and of good flavour. August. Tree a most abundant bearer.

Golden Transparent Gage. Fruit large, round, bright golden-yellow; flesh very tender and of exquisite flavour. October. This should not be pruned severely.

Large Black Imperial. Fruit very large, dark purple; flesh firm, and excellent for culinary purposes. September. Hardy and prolific.

Monarch. Fruit large, oval, deep purple-blue, covered with a dense bloom; flesh firm, brisk, and pleasant, parting freely from the stone. September. A very valuable, late, culinary variety, raised by Mr. Rivers, and should prove an acquisition for market growers, as the tree is hardy and very prolific either against wall or in the open ground, and the fruit does not crack with the rain.

Reine Claude du Comte Hathem. Fruit medium to large, round, rosy-red, with a lovely bloom; flesh melting and of delicious flavour, parting freely from the stone. September. A dessert variety of great excellence when grown against a wall, and a good cropper.

Wyedale. Fruit medium, roundish, dark purple; flesh yellow, firm, and excellent for cooking. Middle of October. One of the best late Plums, frequently hanging on the trees after all the foliage has fallen. It is very hardy, and succeeds in cold districts.

Damsons.

Blue Prolific. Fruit medium, deep purple; flesh juicy and highly flavoured. Early in August. Tree very productive.

Bradley's King. Fruit large, oval, deep purple-black. A very fine, new variety, a great cropper, and rapidly coming into favour with market growers.

Frogmore. Fruit medium, roundish-oval, black; flesh firm and of excellent flavour, quite good enough for dessert. August. This is the richest-flavoured Damson, and the tree is very hardy and prolific.

PLUM, GUINEA. *See* **Parinaria excelsa.**

PLUM FIR. *See* **Prumnopitys elegans** (*Podocarpus andina*).

PLUM NUTMEGS. A common name for the fruits of some species of *Monimiaceæ*.

PLUMBAGO. To the species described on pp. 169-70, Vol. III., the following variety should be added:

P. capensis alba (white). A variety having white flowers. 1886.

PLUMED THISTLE. *See* **Cnicus.**

PLUMERIA. To the species described on p. 170, Vol. III., the following should be added:

P. alba (white). *fl.* white, 2in. long, fragrant; corolla lobes rather longer than the tube; cyme long-pedunculate, with fascicled branches. July and August. *l.* narrow-lanceolate, 6in. to 12in. long, revolute, coriaceous; petioles ¾in. to 1½in. long. West Indies, 1738 and 1894.

PLUTELLA CRUCIFERARUM. *See* **Diamond-Back Moth.**

POA. To the species described on p. 171, Vol. III., the following should be added:

P. flabellata (fan-shaped). *fl.*, spikelets compressed, about five-flowered; glumes sub-equal; paleæ unequal, the outer ones acuminate, somewhat awned; panicle oblong, dense, compressed. *l.* highly glabrous, convolute, acute, rigid; lower ones flabellate, distichous. Falkland Island, Cape Horn, &c. SYNS. *Dactylis cæspitosa* (R. G. 1194, 1197), *Festuca flabellata.*

POCKET PLUMS. *See* **Bladder or Pocket Plums.**

PODACHÆNIUM (from *pous, podos*, a foot, and *achane*, an achene; in allusion to the achenes being contracted at the base into a two-winged stalk). SYNS. *Cosmophyllum* and *Dicalymma.* ORD. *Compositæ.* A small genus (two species) of stove, American shrubs. One of them, *P. paniculatum*, will be found described under **Zaluzania** (which *see* for culture).

P. andinum (from the Andes). *fl.-heads* disposed in loose corymbs; ray florets white; disk yellow. *l.* large, coarsely lobed. Andes of Colombia, 1892. A useful plant for sub-tropical bedding. (R. H. 1892, p. 414, f. 125-6.)

PODALYRIA. *P. lupinoides* is a synonym of *Thermopsis lanceolata.* *P. capensis* is identical with *Virgilia capensis*, and *P. australis* is the same as *Baptisia australis.*

PODANTHES. This genus is now included under *Stapelia.* *P. incarnata* is a synonym of *Boucerosia incarnata.*

PODIANTHUS. A synonym of **Trichopus** (which *see*).

PODISOMA FUSCUM. *See* **Pear—Fungi.**

PODOCARPUS. To the species described on pp. 172-3, Vol. III., the following should be added:

P. alpinus (alpine). *fr.* small, bifid. *l.* thickly scattered or somewhat distichous, linear, obtuse, ¼in. to ½in. long, with a small spine at apex, deep green above, glaucous beneath. Branches long, slender, spreading. *h.* 10ft. to 12ft. (when supported by a stake). Tasmanian mountains, &c. A hardy species.

P. andinus. The correct name is *Prumnopitys elegans.*

P. andinus (of gardens). A synonym of *P. chilina.*

P. asplenifolia (Spleenwort-leaved). A synonym of *Phyllocladus rhomboidalis.*

P. chilinus (Chilian).* *fr.* dark purple, ¼in. to ½in. long. *l.* linear-lanceolate, acute, straight or rarely falcate, alternate, spreading, sessile, entire, flat, smooth, bright green, 3in. to 4in. long, with a single, paler nerve, glaucous beneath. Branches very numerous, alternate, opposite, or in threes. *h.* 40ft. to 60ft. Mountains of Chili, 1853. Hardy in the South and West of England. SYN. *P. andinus* (of gardens).

P. elatus (tall). The correct name of *P. ensifolius.*

P. Endlicherianus is probably a form of *P. neriifolius.*

P. japonica elegantissima (very elegant). *l.* when young pale yellow, but with age assuming the normal tint.

P. macrophyllus (large-leaved). *fr.* oval, as large as Peas. *l.* alternate or scattered, linear-lanceolate or somewhat oblong, flat on the edges, distant, dry, coriaceous, 2in. to 4in. long, ½in. broad, rarely falcate, pale shining green, obtuse, or with a stiff, blackish point. *h.* 40ft. to 50ft. Japan. Hardy. There are gold- and silver-leaved varieties respectively. This is one of the species used by the Japs for dwarfing.

P. pectinatus (comb-like).* *l.* nearly 1in. long, ⅛in. broad, densely arranged in two ranks, one on either side of the branches, linear, falcately curved towards the acute point, dark green above, silvery beneath, with revolute margins. New Caledonia, 1892. Greenhouse. A pretty species for table-decoration.

P. variegatus (variegated). A synonym of *P. Totara.*

PODOCHILUS (from *pous, podos*, a foot, and *cheilos*, a lip; the lip is joined to the column at its apex by a foot or stalk). SYNS. *Apista, Cryptoglottis, Hexameria, Platysma, Plocostigma.* ORD. *Orchideæ.* A genus embracing about a dozen species of stove, epiphytal Orchids, natives of the East Indies and the Malayan Archipelago. Flowers small, often minute, disposed in terminal racemes; sepals erect, connivent; petals almost equal to the dorsal sepal or narrower; bracts small. Leaves small, distichous. *P. longicalcaratus*, the only species introduced, requires similar culture to other East Indian Orchids.

P. longicalcaratus (long-spurred). *fl.* white and purple, small, disposed in a raceme 1in. long. *l.* 1in. long, ¼in. broad. Stem 2ft. long. Borneo, 1894.

PODOCOCCUS (from *pous, podos*, a foot, and *kokkos*, a berry; in allusion to the stalked, baccate fruit). ORD. *Palmæ.* A monotypic genus. The species is a stove Palm, allied to *Wallichia.* For culture, *see* **Palmæ** Young plants grow slowly, and sucker very freely, in a hot, moist house.

P. Barteri (Barter's). *fl.* reddish, sessile, ternate; spadices simple, pendulous, on long, slender peduncles; spathes four, tubular, marcescent. *fr.* orange, oblong-cylindrical, stalked,

Podococcus—*continued.*

nearly 1in. long, edible. *l.* glaucescent, 5ft. to 6ft. long, alternate, unequally pinnatisect; segments eight or ten, remote; membranous, rhomboid-lanceolate, acute, many-nerved, the terminal ones confluent; sheath long, cut. *h.* 5ft. to 8ft. Western tropical Africa, 1893. Whole plant reddish-furfuraceous. (T. L. S. xxiv., p. 426, t. 38A, 40B, 43A.)

PODOCYTISUS. Included under **Laburnum** (which *see*).

PODOLEPIS. To the species described on pp. 173-4, Vol. III., the following should be added:

P. rugata (wrinkled). *fl.-heads* yellow, at least as large as in *P. acuminata*; ray florets three- or four-lobed. Summer. *l.* oblong, lanceolate, or linear. A rather stout perennial, with the habit of *P. acuminata* (from which this is distinct) but usually retaining more of a white, cottony wool.

PODOPHYLLUM. Four species are now referred to this genus, two of them being Chinese. To those described on p. 174, Vol. III., the following should be added:

P. diphyllum (two-leaved). A synonym of *Jeffersonia binata* (*diphylla*).

P. pleianthum (several-flowered). *fl.* rich purple, drooping, produced in large bunches. *fr.* glaucous-green at first, purple when ripe, resembling that of the May Apple (*P. peltatum*). *l.* peltate, orbicular, six- to eight-lobed; lobes triangular, acuminate, very shallow, with toothed margins. *h.* 1ft. to 2ft. China, 1889. (B. M. 7098; G. C. 1889, vi., p. 299, f. 44.)

PODOSPHÆRA KUNZEI. *See* **Plum—Fungi.**

PODOSPHÆRA OXYACANTHA. *See* **Apple Powdery Mildew.**

PODOTHECA. To the species described on p. 175, Vol. III., the following should be added:

P. chrysantha (golden-flowered). *fl.-heads* golden-yellow, numerous, 1in. across; florets numerous, exceeding the involucre; peduncles rather long, dilated under the heads. *l.* linear, scabrid. *h.* 1ft. 1898. An erect annual. (B. M. 7625.)

PŒCILOSOMA CANDIDATUM. *See* **Rosa—Insects.**

PŒPPIGIA (of Bertero). A synonym of **Rhaphithamnus** (which *see*).

POGOCHILUS. A synonym of **Galeola** (which *see*).

POGOGYNE. To the species described on p. 175, Vol. III., the following should be added:

P. nudiuscula (nearly naked).* *fl.* bright blue, about ½in. long, bilabiate, whorled. Summer. *l.* tufted, linear, obtuse, glabrous Branches slender, puberulent. *h.* 9in. to 12in. California, 1886. A pretty, dwarf, compact annual. (R. G. 1241.)

POGONIA. To the species described on p. 175, Vol. III., the following should be added:

P. Barklyana (Sir Henry Barkly's).* *fl.* green, with a darker green flush; sepals lanceolate, acuminate; petals broader and shorter; lip trifid, the side laciniæ angulate, the middle one acuminate, reflexed at apex; peduncle nearly 2ft. long. sometimes eleven-flowered. *l.* large, roundish, apiculately sinuate, cordate at base, 9in. broad; petioles 9in. high. Mauritius, 1885. A fine species.

P. plicata (folded). *fl.* 1½in. across; sepals and petals greenish, widely spreading, acuminate; lip whitish or rose-coloured with a pink tip, embracing the column; stem 4in. to 6in. long. *l.* orbicular-cordate, 2in. to 4in. across, many-nerved. Tuber globose. India.

P. speciosa (showy). *fl.* purple, large, not unlike those of a *Bletia*, two or three produced at the apex of an erect stem 4ft. high. *l.* alternate, ovate-oblong, glaucous. Brazil, 1894.

POGONOPUS. *P. exsertus* is the correct name of the plant described on p. 175, Vol. III., as *P. caracasensis*.

POGOSPERMUM. A synonym of **Catopsis** (which *see*).

POGOSTEMON. According to the compilers of the "Index Kewensis," *P. Heyneanus* is the correct name of *P. Patchouli*.

POHLIA PLATENSIS. The plant found occasionally catalogued under this name is a species of *Cypella*.

POINCIANA GILLIESII. A synonym of **Cæsalpinia Gilliesii** (which *see*).

POINTING-IN. When applying chemical or other manures to land which is full of roots, it is necessary to merely point them in with a fork. The roots thus receive immediate benefit, without injury, as would be the case if such manures were dug in with a spade or other sharp implement.

POISON BULB, CAPE. *See* **Brunsvigia toxicaria** (the correct name of which is now *Buphane disticha*).

POISON ELDER. *See* **Rhus venenata.**

POISON NUT. *See* **Strychnos Nux vomica.**

POISONOUS PLANTS. A number of plants, both hardy and tender, are more or less poisonous, and need to be handled with care, or serious results may ensue. To enumerate a few, Euphorbias, Oleanders, Poinsettias, and *Hippomane Mancinella*. The sap of these has had very injurious effects on gardeners with cuts or wounds on their hands. Another extremely poisonous genus is *Rhus*, and simply handling species like *venenata* and *Toxicodendron* has caused great swelling of the limbs. Then there are plants which, if not poisonous in the strict sense of that term, cause trouble by means of the irritant hairs. *Primula obconica*, to wit, causes skin eruptions on many people. Then several bulbous plants are highly poisonous—the common Meadow Saffron (*Colchicum autumnale*) and *Buphane toxicaria* are good examples.

POISON SUMACH or WOOD. *See* **Rhus venenata.**

POLAR PLANT. *See* **Silphium laciniatum.**

POLEMONIUM. To the species and varieties described on p. 177, Vol. III., the following should be added:

P. cœruleum campanulatum (bell-shaped). *fl.* bright lilac-blue, with golden stamens, pendent, bell-shaped. April and May. *l.* pinnatifid; leaflets lanceolate. Northern Europe, 1892.

P. flavum (yellow). *fl.* light yellow, tinged with tawny-red outside, 1in. in diameter; corolla infundibular-campanulate, glandular-puberulous; cymes corymbose. September. *l.* pinnate; leaflets many-jugate, elliptic-lanceolate, acute. Stem 2ft. to 3ft. high, simple or corymbosely branched, loosely tomentose above. New Mexico. (B. M. 6965.)

P. himalayanum (Himalayan). *fl.*, corolla 1½in. in diameter, the segments lilac-blue, round; panicle axis and calyx very hairy. Himalayas.

P. pauciflorum (few-flowered). *fl.* yellow, tinged with red on the outside; corolla funnel-shaped, 1½in. to 2in. long. *l.* pinnate; leaflets narrow-lanceolate, acute, 1in. long. *h.* 1½ft. Mexico, 1889. A branching, leafy, glandular-pubescent perennial. (G. C. 1889, vi., p. 96, f. 15.)

P. Richardsonii. *fl.* nodding, in terminal corymbs; corolla limb pale purple, marked with deeper veins, the segments broad. Summer and autumn. *l.* pinnate, with an odd leaflet; leaflets ten or twelve pairs on the radical leaves, fewer on the cauline ones, entire, pubescent below. Stem erect, branched. Great Bear Lake, 1825. By some botanists this is referred to *P. humilis*.

P. sibiricum (Siberian). A synonym of *P. cæruleum dissectum*.

POLIANTHES. To the species, &c., described on p. 178, Vol. III., the following should be added:

P. tuberosa gracilis (slender). *fl.*, perianth having a long, slender tube. August. *l.* narrower and habit slenderer than in the type. 1879.

POLY, or GERMANDER. *See* **Teucrium.**

POLYANTHUS. This old-fashioned garden flower still holds its own and is of the greatest use in providing a display of spring flowers. Varieties have been much improved these last few years, a selection of the best up to date being: Danesford Yellow; Erin's Yellow; Golden Ball; Hermand; John Woodbridge; Miss Nelly Fraser; Pantaloons; Queen Victoria; Rex Theodore; Terra Cotta; Tortoiseshell; and Woodside Red.

POLYCARPÆA. *P. microphylla* is the correct name of *P. gnaphalioides*. *P. memphitica* is now classed under *Polycarpon*.

POLYCARPON LŒFLINGIÆ. The correct name of **Polycarpæa memphitica** (which *see*).

POLYCYCNIS. To the species described on pp. 182-3, Vol. III., the following should be added:

P. Lehmanni (Lehmann's). *fl.* light brown, spotted with purple, 1½in. across; disk covered with long, white hairs; scape pendulous, 9in. long, many-flowered. Pseudo-bulbs oblong, sulcate, 1in. long, each bearing a lanceolate leaf 7in. long. Colombia, 1894. (G. C. 1895, xviii., p. 245.)

POLYDESMUS EXITIOSUS. *See* **Turnip—Fungi.**

POLYGALA. To the species, &c., described on p. 183, Vol. III., the following should be added. Several plants formerly included hereunder are now referred to **Brachycarpæa, Mundtia,** and **Muraltia.**

P. amarella (slightly bitter). A synonym of *P. calcarea.*

P. calcarea (chalk-loving). *fl.* bright blue, pink, or white, in short, terminal racemes of six to twelve. Summer. *l.* spathulate, narrowed to the petioles, somewhat reflexed. Stems prostrate. Europe (South of England). SYN. *P. amarella.*

P. Chamæbuxus purpurea (purple).* A beautiful variety with magenta-purple blossoms.

P. cordifolia (cordate-leaved). A synonym of *P. oppositifolia cordata.*

P. Dalmaisiana (Dalmais'). *See* under **P. myrtifolia grandiflora.**

P. Galpini (Galpin's). *fl.* pale rosy-lilac, nearly 1in. across the expanded wings; racemes axillary, erect, 3in. to 4in. long. September. *l.* shortly petiolate, 2in. to 3in. long, ovate, acuminate, bright green above, paler beneath. Branches flexuous. *h.* 3ft. to 5ft. Swaziland, 1889. A slender, straggling, greenhouse shrub. (B. M. 7439.)

P. grandifolia (large-leaved). The correct name of *P. Hilairiana.*

POLYGAMOUS. Having male and hermaphrodite, or female and hermaphrodite, or male, female, and hermaphrodite flowers all together on the same plant.

FIG. 637. POLYGONATUM MULTIFLORUM.

POLYGONATUM. SYN. *Campydorum. P. multiflorum* (Fig. 637, for which we are indebted to Messrs. J. Veitch and Sons) is quite one of the most useful of plants for forcing purposes. It should be potted up in November, and afterwards plunged in cocoa-nut fibre till growth starts, when the plants should be placed in their flowering quarters. To the species described on p. 184, Vol. III., the following should be added:

P. hirtum (hairy). A synonym of *P. latifolium.*

P. latifolium (broad-leaved).* *fl.* one to five, drooping from the axils; perianth ¾in. long, the tube white, the segments greenish. July. *l.* ten to fifteen, alternate, oblong, 3in. to 6in. long, puberulous beneath. Stem 2ft. to 4ft. high, puberulous above. Europe, &c., 1802. SYNS. *P. hirtum, Convallaria latifolia.*

P. l. commutatum (changed). *fl.* white, large, three to seven in a bunch. Stems and leaves glabrous throughout. *h.* 2ft. to 7ft. North America.

P. Moserianum (Moser's). A garden variety, with variegated leaves. 1897.

P. multiflorum bracteatum (large-bracted). *fl.* borne throughout the summer; bracts much developed.

P. m. Broteri (Broter's). A large-flowered variety.

P. officinale flore-pleno (double-flowered). A desirable, double-flowered variety.

P. Thunbergi (Thunberg's). This is frequently catalogued as of specific rank. It is, however, referable to *P. latifolium,* of which it is a glabrous form.

POLYGONUM. Including *Ampelygonum.* To the species described on pp. 185-6, Vol. III., the following should be added:

P. adpressum (adpressed), of Labillardière. A synonym of *Muehlenbeckia adpressa.*

P. amplexicaule oxyphyllum (sharp-leaved). A variety having feathery white plumes of fragrant flowers. Autumn. *h.* 2ft.

P. baldschuanicum (Baldschuanic).* *fl.* rose-coloured, nearly ¼in. across, in small fascicles; panicles axillary and terminal, effuse, the branches angular. September. *l.* long-petiolate, ovate- or hastate-cordate, obtuse to acuminate, pale green. Stem slender, woody, climbing to 20ft., ¼in. thick at base. Bokhara, 1888. A very beautiful, hardy species. (B. M. 7544; R. G. 1888, t. 1278.)

P. chinense (Chinese). *fl.* white, pink, or purplish, in small panicled or corymbose heads. *l.* extremely variable; petioles usually having two auricles at base. Temperate Himalaya, &c. A rambling or erect (5ft.), hardy shrub. SYN. *Ampelygonum chinense.* The form *foliis-pictis* has some leaves green, others purple, all with a white V-shaped mark. China.

P. crispulum (slightly crisped). A synonym of *Atraphaxis buxifolius.*

P. lanigerum (wool-bearing). *fl.* carnation-red or white; racemes 1in. to 2in. long, disposed in slender, divaricate panicles. *l.* sessile or petiolate, narrowly lanceolate, 4in. to 8in. long, finely acuminate (rarely glabrous above). Stem 2ft. to 10ft. long, much-branched, procumbent and creeping below. Tropics of the Old World, 1839. Half-hardy perennial, clothed with snow-white tomentum. (R. G. 1890, p. 224, f. 52.)

P. macrophyllum (large-leaved). The correct name of *P. sphærostachyum.*

P. molle (soft). *fl.* white, in large, terminal, thyrsoid, tomentose panicles. *l.* petiolate, elliptic-lanceolate, silkily pubescent, tomentose, or villous beneath. Branches stout, hairy. *h.* 2ft. Temperate Himalayas, 1832. Hardy shrub; excellent for grouping.

P. multiflorum (many-flowered). *fl.* whitish, small, in loose, spreading panicles. *l.* cordate-ovate, acute, 4in. long, 3in. broad, shining, deep green. Stems numerous, long, slender, reddish. Root tuberous. Japan, China, &c., 1881. Hardy perennial climber or trailer.

P. orientale variegatum (variegated). An ornamental garden variety, distinguished from the type in having variegated leaves. 1892. (R. H. 1892, p. 37, f. 8.) The form *pumilum* (dwarf) is rather earlier than the type.

P. petiolatum (long-petiolate). A synonym of *P. amplexicaule.*

P. polystachyum (many-spiked). *fl.* white or pink, ¼in. across, in a large, very variable, effuse panicle. *l.* sub-sessile or petiolate, oblong-lanceolate, 4in. to 9in. long, caudate-acuminate, the base usually contracted and sub-hastately cordate or truncate. *h.* 3ft. to 6ft. Temperate Himalaya. Hardy shrub.

P. virginianum (Virginian). *fl.* greenish; racemes 6in. to 16in. long, very slender. August and September. *l.* elliptic or elliptic-lanceolate, 4in. to 10in. long, thin, many-nerved; petioles ½in. to 1in. long. Stem erect, 2ft. to 5ft. or more in height. North America, India, Japan, &c., 1640. Hardy perennial.

P. viviparum (viviparous). *fl.* pink, sub-erect, very variable in size, disposed in solitary, erect, slender spikes 1in. to 4in. long. *l.* very variable, 1in. to 6in. long, sometimes pubescent or tomentose beneath. Stem slender, 6in. to 12in. long. Root-stock woody. Himalayas, Arctic Europe, &c. Hardy perennial.

POLYMNIA. To the species described on p. 186, Vol. III., the following should be added:

P. maculata (spotted). *fl. heads* having ten linear-lanceolate, toothed rays. September to November. *l.* opposite, sinuate-lobed, decurrent. Stems sulcate, nearly glabrous. *h.* 6ft. Mexico (on mountains). Half-hardy perennial.

POLYPAPPUS (of Nuttall). A synonym of **Tessaria** (which *see*).

POLYPHRAGMON. A synonym of **Timonius** (which *see*).

POLYPODIUM. Including *Anapeltis, Dipteris, Schellopsis, Stegnogramme, Thylacopteris,* and *Xiphopteris.*

CULTURE. The Polypodiums, both British and exotic, are of two different structures and of various habits. A small proportion of them, such as our common "Oak" and "Beech" Ferns (*P. Dryopteris* and *P. Phegopteris*), are deciduous, and provided with slender rhizomes which delight in running underground, especially in partly-

Polypodium—*continued.*

decayed vegetable matter; the foliage of these species, as a rule, is of a soft, papery texture. The majority of them, however, are of an evergreen nature, having fronds of a somewhat leathery texture, produced from rhizomes which prefer being kept above or close to the surface of the ground.

Those species provided with underground rhizomes may be either grown in pots or planted in any part of the stove, the cool Fernery, or the outdoor rockery, according to their native habitats; and for these, a mixture composed of two parts fibrous loam, one part leaf-mould, and one part sharp silver-sand, answers all requirements. This treatment also applies to the species in which the fronds are produced from a single crown. The epiphytal species, which do not burrow, but keep near, or even on, the surface of the soil, require a different material to grow them luxuriantly. Good fibrous peat, or, better still, half-decayed leaf-mould, should form the best part of their compost, in which silver-sand is not needed, but to which a fourth part of fibrous loam may be added to give it cohesion. Whether grown in pots or planted in the rockery, these species should have good drainage and comparatively shallow pots or pockets. The epiphytal species are particularly adapted for covering Tree-Fern stems and for growing in hanging-baskets, in which positions their rambling habit is shown to great advantage.

The majority of Polypodiums are propagated by division of their rhizomes at almost any time of the year; but a few species grown extensively for decorative purposes are more rapidly propagated by means of their spores, which are abundantly produced, germinate freely, and produce better-shaped plants than those obtained from division of the rhizomes. Being evergreen and strong growers, *P. aureum* and its varieties require substantial food; a mixture consisting of about equal proportions of fibrous peat, loam, and silver-sand suits them best. They must also receive a liberal supply of water at the roots while growing, as well as occasional waterings with weak liquid manure. *P. Billardieri* is a particularly shallow-rooting plant; it flourishes best in a flower-pan, in a mixture in which fibrous peat predominates.

In planting *P. Dryopteris*, a spot where moisture and shade can always be depended upon should, if possible, be selected, and a shallow bed made of a compost of two parts of fibrous peat, one part of leaf-mould, and a free admixture of silver-sand, or, better still, of broken sandstone. If grown in pots for a cool frame or for the greenhouse, where it makes most pleasing objects, the above mixture will be found equally suitable; but in either case avoid putting in too much soil: a depth of 3in. to 4in. is quite sufficient. It is also indispensable that thorough drainage should be secured, for water remaining stagnant about its roots is very injurious to *P. Dryopteris*. In planting, great care must also be taken to prevent the rhizomes from being buried too deeply, in which case they seldom grow; they must be kept only just below the surface of the soil, through which it is advisable to allow the tips to protrude. Planting should take place about April, and a moderate watering must follow, after which the soil requires to be kept constantly moist. Although totally deprived of foliage during four or five months of the year, the Oak Fern should never be allowed to get dry at the roots, for the rhizomes soon shrivel up and the spring growth then only produces small or deformed fronds, as the plants are much weakened. It is also advisable to give plants grown in pots a slight covering during the winter, though they do not require this attention when planted out. This species, readily increased by division, does not appear to have produced any constant variations; several more or less curious forms of it have from time to time been noticed, but none of them have remained constant under cultivation.

As a rule, *P. Meyenianum* (Fig. 638) is a difficult plant to manage in pots, but it thrives apace when treated like a Platycerium—grown either on a stump, in a shallow pan, or in a hanging-basket. Care should be taken not to bury its rhizomes. The soil should be pure fibrous peat, on which the rhizomes should at first be pegged down, free scope being allowed for their extension. Grown in that way, it soon repays any extra trouble bestowed on its culture.

Polypodium—*continued.*

Like the Oak Fern (*P. Dryopteris*), *P. Phegopteris* may with advantage be planted out in the open Fernery or grown in pots, and the compost recommended for that pretty species is equally suitable for the Beech Fern, but a greater depth—about 6in.—must be allowed, as it roots much deeper into the ground. Care must also be taken not to bury the rhizomes deeply, but to keep them barely below the surface of the ground. A moist, shady place is indispensable, as the plant is particularly partial to an abundant and constant supply of water, and to frequent syringings during the growing season. When cultivated in pots in a cool house, the Beech Fern is nearly evergreen, as its old fronds, though discoloured and generally broken at the base, remain on the plants almost until the new ones make their appearance.

P. pustulatum is a species of easy culture; it is well adapted for growing in dark places where hardly any other Fern would thrive, and for planting in such positions on stones or rockwork, which it rapidly covers and to which it clings with a remarkable tenacity. *P. subauriculatum* is a Fern which may with great advantage be utilised for covering dead trunks of Tree-Ferns; in such positions it makes a very beautiful object and grows apace, as it delights in sending its roots and rhizomes into partly-decayed vegetable matter. In the centre of a warm conservatory it surpasses all others in elegance, and where there is plenty of height to allow the fronds space to hang, a specimen with numberless fronds 10ft. to 12ft. long is a sight not easily forgotten. If grown in a basket, it will derive great benefit from a small portion of chopped sphagnum added to the mixture of soil, and will stand a fair amount of strong light.

P. vulgare is found most useful for adorning the hardy rockery, where it proves very effective when growing in a mass, and the ease with which it can be managed, coupled with its evergreen nature, greatly adds to its value as a hardy decorative plant. In the culture of this species it is well to imitate nature as closely as possible. To that effect it is necessary that the spot selected should be shady, cool, and damp, yet without stagnant moisture. The soil which best suits this species is one composed of leaf-mould, or a vegetable compost, interspersed with a cool but not too moist clay or garden mould. Following nature, the rhizomes should not be buried in the ground, but fastened close down to it, the roots alone being covered. Another very important point in connection with the cultivation of the Common Polypody is that it must be planted where its rhizomes can take undisturbed possession of the place selected, as it is only when the plants are well established that they produce really beautiful foliage.

Besides being so highly useful for cultivation out of doors, the Common Polypody and its several varieties are well adapted for the ornamentation of the cool Fernery under glass, where they may be used with great advantage and effect. Nearly every position is adapted to their requirements, although the more elevated parts of the rockwork are preferable, and the shady parts of the Fernery are also more suitable than those which are exposed to strong light.

The only position in which these plants do not thrive is one in which they are continually exposed to the dripping of water, for even occasional thorough dryness at the roots does not cause the immediate destruction of the fronds. *P. vulgare* and its varieties are usually propagated by division, which may be done at almost any time of the year, though spring is the most suitable season.

Although quite hardy, *P. v. cambricum* makes a splendid pot plant when grown in the cold frame or in the greenhouse, the pleasing pale green colour of its foliage being particularly attractive among other Ferns.

To the species and varieties described on pp. 186-95, Vol. III., the following should be added. Except where otherwise indicated, stove treatment is required.

P. accedens (approaching). *rhiz.* wide-creeping, filiform, scarcely scaly. *sti.* very short. *fronds*, barren ones oblong, obtuse; fertile ones longer and narrower (2in. to 4in. long and ¼in. to ½in. broad), the fructification confined to the narrowed upper part; texture coriaceous. *sori* in single rows close to the midrib. Malaya, &c. SYN. *Phymatodes accedens.*

P. alpestre. There are three other varieties of this species: *interruptum*, *laciniatum*, and *lanceum*, all natives of Britain.

Polypodium—*continued.*

P. amœnum (pleasing). *rhiz.* stout, densely clothed with dull brown scales. *sti.* firm, erect, naked, 6in. to 12in. long. *fronds* 1ft. to 2ft. long, 6in. to 12in. broad, cut nearly to the rachis into numerous entire or slightly-toothed pinnæ 3in. to 6in. long, of a firm but papery texture. *sori* in a single series. Nepaul, Khasya, &c. (at 6000ft. to 10,000ft.). Greenhouse. SYN. *Goniophlebium amœnum.*

P. amplum (large). *fronds* very large, tripinnatifid; ultimate segments oblong, blunt, of smooth texture, slightly indented on the margins. *sori* large, in one row on each side of the midvein, eventually covering the whole under-side of the frond. Martinique. SYN. *Phegopteris ampla.*

P. appendiculatum (having appendages?). *sti.* tufted, about 1ft. long. *fronds* broadly lanceolate, 1½ft. to 2ft. long, 8in. to 10in. broad; pinnæ 3in. to 5in. long, ¾in. to 1in. broad, cut down nearly to the midrib into narrow-oblong, falcate lobes of a soft, papery texture; lower pinnæ having a small gland at the base. *sori* close to the midrib. Eastern Himalayas and Penang. SYN. *Phegopteris appendiculatus.*

P. appendiculatum (of gardens). A form of *P. plesiosorum.*

P. areolatum (areolate). A form of *P. aureum.*

P. aureum Mayii (May's).* *fronds* undulated, serrated, of a silvery lustre, having the veins tinted with purple. 1898. SYN. *Phlebodium Mayii* (G. C. 1898, xxiii., p. 332, f. 121).

P. Barberi (Barber's). *sti.* tufted, 6in. to 12in. long, slightly scaly at base. *fronds* palmately five-lobed or more usually pinnate, consisting of a terminal segment and one to four pairs of pinnæ 4in. to 6in. long, 1in. broad, nearly entire, coriaceous, and naked on both sides. *sori* abundant, disposed principally in two rows near the main veins. Malaya. SYN. *Dictyopteris Barberi.*

P. bifurcatum (twice-forked). A synonym of *P. Lobbianum.*

P. biseriale (in two series). *sti.* slightly scaly, 1ft. to 2ft. long. *fronds* much divided, 2ft. to 3ft. long, 1ft. or more in breadth; lowest pinnæ 6in. to 8in. long, cut down to the rachis into oblong-lanceolate pinnules, which are subdivided into lobes of a thin, papery texture. *sori* in pairs on the lower lobes. Andes of Peru and Ecuador. SYN. *Phegopteris biserialis.*

P. brasiliense cristatum (crested).* *fronds* 3ft. to 4ft. long, gracefully arching; pinnæ 6in. long and terminating in two complex tassels. A distinctly beautiful variety.

P. calcareum (chalk-loving). A synonym of *P. Dryopteris Robertianum.*

P. cambricum (Welsh). A form of *P. vulgare.*

P. carnosum (fleshy). A form of *P. lomarioides.*

P. caudiceps (tail-headed).* *rhiz.* long, slender, creeping. *sti.* slender, 2in. to 4in. long. *fronds* simple, glabrous, oblong-lanceolate, 6in. long, 1in. or rather more broad, tapered below to a narrow wing, the apex drawn out into a narrow, attenuated point or tail (hence the specific name). *sori* round, naked, produced on the lowest veinlet. Formosa, 1886. An elegant basket Fern. SYN. *Goniophlebium caudiceps.*

P. chnoodes (downy or woolly).* *rhiz.* stout, densely clothed with dull brown scales. *sti.* erect, slender, naked, 4in. to 6in. long. *fronds* drooping, 1ft. to 2ft. long, 4in. to 9in. broad, cut to the rachis into distinct, falcate, opposite pinnæ, 2in. to 4in. long, ½in. broad, cordate at base, of a soft texture, and finely hairy on both surfaces. *sori* in two series on each side of the main veins. West Indies, &c. SYNS. *P. dissimile, Goniophlebium chnoodes.*

P. contiguum (contiguous). A synonym of *P. longifolium.*

P. difforme macrophyllum (large-fronded).* *fronds* 5ft. long, bright green; pinnæ 9in. long, 2in. broad, toothed. 1898. A large, bold form.

P. dissimile (dissimilar). A synonym of *P. chnoodes.*

P. divergens (diverging). A synonym of *Nephrodium effusum.*

P. effusum (spreading). A synonym of *Nephrodium effusum.*

P. flocculosum (slightly woolly). *rhiz.* short, clothed with bright brown scales. *sti.* firm, erect, 4in. to 6in. long, woolly upwards. *fronds* entire, 6in. to 18in. long, 1in. to 1½in. broad, gradually narrowed to the apex, coriaceous, densely clothed beneath with rusty-brown wool. *sori* bright-coloured, in straight, diagonal rows from midrib to edge. Northern India (at 5000ft.). Greenhouse. SYN. *Niphobolus flocculosus.*

P. fossum (ditch-loving).* *rhiz.* slowly creeping. *fronds* about 1ft. long, varying from linear-lanceolate to ovate, the edges sinuately toothed or lobed; lobes longer or shorter according to the breadth of the frond, simple or bifid, or in the broadest fronds multifidly flabellate, deep green above. *sori* large, roundish, sunk in deep cavities which form a line of bosses on the upper surface. 1882. A distinct and interesting, evergreen Fern, well adapted for basket culture. SYN. *Pleopeltis fossa.*

P. grandiceps (large-headed). *fronds* arising at intervals from a slender, creeping rhizome, simple, oblong-lanceolate, leathery, about 6in. long and 1in. broad, tapering below into a narrow wing. Formosa, 1885. A dwarf Fern, suitable for basket culture. SYN. *Goniophlebium grandiceps.*

Polypodium—*continued.*

P. grandi-nigrescens (hybrid).* A novel and bold Fern, described as a hybrid between *P. nigrescens* and *P. vulgare grandiceps.* (G. C. 1898, ii., p. 356, f. 105-6.)

P. grenadense (Grenada). *rhiz.* shortly creeping. *fronds* pinnate, 5in. to 6in. long, cartilaginous, pellucid, bright green. Antilles, 1894.

P. Griffithianum (Griffith's). *rhiz.* wide-creeping, densely clothed with dull brown scales. *sti.* firm, erect, 3in. to 6in. long. *fronds* simple, 6in. to 8in. long, 1½in. to 2in. broad, wavy-edged, acuminate at apex, rounded, narrowed, or auricled at base. *sori* large, in a row near the midrib, one between each main vein. Northern India. Greenhouse. SYN. *Phymatodes Griffithianum.*

P. hastatum. *rhiz.* firm, with bright rusty scales. *sti.* 3in. to 4in. long, firm, erect, glossy. *fronds* 4in. to 6in. long, simple, lanceolate, ½in. to 1½in. broad, or three-lobed, with the lateral lobes like the terminal one but smaller. *sori* in a single row, nearer the midrib than the edge. Japan to Formosa, 1820. Stove or greenhouse. SYN. *Phymatodes hastatum.*

P. hirsutum (hairy). *sti.* tufted, 3in. to 4in. long, densely scaly. *fronds* oblong-lanceolate, 6in. to 9in. long, tripinnatifid, parchment-like, scaly on both sides, but especially below. *sori* in a row on each side of, and close to, the midvein. Minas Geraes, Brazil. SYN. *Phegopteris hirsuta.*

P. hymenodes (membrane-like). A synonym of *P. superficiale.*

P. inæquale (unequal). A synonym of *P. guatemalense.*

P. intermedium (intermediate). A synonym of *P. californicum.*

P. irioides (Iris-like). *rhiz.* stout, clothed with dark brown scales. *fronds* 1ft. to 3ft. long, 1in. to 3in. broad, gradually narrowed to both ends, entire, thick, fleshy, pale or yellowish-green, naked on both sides. *sori* very small and copious, irregularly scattered. New South Wales, &c., 1824. A singular, erect-growing species. SYN. *Phymatodes irioides.*

P. i. cristatum (crested). A crested form of the type. SYN. *P. leopeltis cristatum.*

P. Karwinskianum (Karwinski's). A synonym of *P. plebeium.*

P. Krameri (Kramer's).* *rhiz.* wide-creeping and freely branching. *sti.* slender, wiry, 3in. to 4in. long. *fronds* thin, pale green, 5in. to 6in. long, 2½in. to 3in. broad, cut half-way to the rachis into oblong, undulated lobes, the lower pair more deeply cut and deflexed. *sori* numerous, black, scattered over the under-surface. Japan, 1878. A pretty, hardy species, in the way of *P. Phegopteris.*

P. lachnopus (downy-stalked). *rhiz.* wide-creeping, densely clothed with black, bristly scales. *sti.* slender, naked, 2in. to 4in. long. *fronds* flaccid, simply pinnate, 1in. to 1½in. long, 3in. to 4in. broad, cut nearly or quite to the rachis into slightly-toothed pinnæ naked on both surfaces. *sori* in single series. Northern India, &c. (at 7000ft.). Greenhouse. SYN. *Goniophlebium lachnopus.*

P. lævigatum (smooth). *sti.* naked, shining, purplish. *fronds* lanceolate, bipinnatifid, 1½ft. long, 3in. to 4in. broad; pinnæ numerous, loose, opposite, 1½in. to 2in. long, cut down to a narrow wing into close, blunt lobes of a parchment-like texture, smooth on both surfaces. *sori* nearly oblong. Peru. SYN. *Phegopteris lævigata.*

P. Lobbianum (Lobb's). *fronds* 1ft. long and broad; main lobes reaching to the base, three or four times forked; ultimate segments linear, entire, coriaceous, dark brownish-green above, tawny beneath. *sori* in a single row on each side of, and near, the midrib. Borneo, &c. SYNS. *P. bifurcatum, Dipteris Lobbiana.*

P. lomarioides (Lomaria-like). *rhiz.* forming a thick, wide-creeping crust, clothed with small, peltate scales. *sti.* 2in. to 4in. long, firm, erect. *fronds* 1ft. to 1½ft. long, 4in. to 6in. broad; barren ones cut within ¼in. to ½in. of the rachis into close, horizontal, oblong, entire, blunt lobes; fertile ones cut nearly to the rachis throughout, with more numerous lobes ½in. to ¾in. broad. *sori* completely immersed, round or oblong, in two rows near the midrib. Malaya, &c. SYN. *Phymatodes lomarioides. P.* (*Lecanopteris*) *carnosum*, according to Baker, appears to be an abnormal form of this, with lobes intermediate in character, and with large sori in very distinct, marginal pits. Penang, 1894.

P. lycopodioides salicifolium (Willow-fronded).* *fronds* longer and narrower than in the type, nearly or quite uniform, both kinds being about 5in. long, scarcely ½in. broad, and beautifully veined. A pretty and free-growing form. Other varieties are *maximum* and *squamulosum.*

P. macrourum (long-tailed). This resembles *P. Phymatodes* in habit and size, but is distinguished by its long-tailed fronds, which are rhomboid-caudate, 2ft. to 3ft. long, 6in. to 12in. broad, bright green, the lanceolate tail having its middle part pinnatifid. Queensland (?), 1886.

P. Meyenianum (Meyen's). Bear's-paw Fern. *rhiz.* stout, with bright ferruginous scales ½in. long. *fronds* 2ft. to 3ft. long, 8in. to 12in. broad, the lower part cut nearly to the rachis into erecto-patent, linear-oblong, blunt, entire lobes, 3in. to 6in. long, ½in. to 1in. broad, the upper part pinnate, with

Polypodium—*continued.*

numerous close pinnæ, 4in. to 8in. long, which consist only of a firm midrib with a row of small, round lobes on both sides, each with a sorus that covers it. Philippines. SYNS. *Aglaomorpha Meyenianum, Drymarium Meyenianum, D. philippense* (of gardens). See Fig. 638.

FIG. 638. POLYPODIUM MEYENIANUM.

P. multilineatum (many-lined). *sti.* firm, erect, naked, 2ft. or more in length. *fronds* pinnate, 3ft. to 4ft. long, 1½ft. to 2ft. broad; pinnæ numerous, sometimes 1ft. long, acute, coriaceous, naked on both sides. *sori* in two rows. Sylhet, Kumaon, &c. A strong-growing species. SYN. *Goniopteris multilineata.*

P. owariense (Owarian). A form of *P. lycopodioides.*

P. Paradiseæ is regarded by the Kew authorities as a variety of *P. pectinatum.*

P. penangianum (Penang).* *fronds* almost stalkless, 1ft. to 1½ft. long, 2in. to 3in. broad, entire, gradually narrowed towards the base and sometimes wavy-edged, papery, hairy beneath. *sori* in rows close together, confined to the upper part, and falling short of the edge. Penang. A distinct and handsome species. SYN. *Niphobolus penangianus.*

P. Phegopteris multifidum (much-cleft). This variety is distinguished from the type in having its fronds irregularly multifid. There is also a crested form known as *cristatum.*

P. Picoti (Picot's).* *fronds* numerous, arching, wavy, elongate-oblong, entire, coriaceous, 3ft. long or more, 4in. to 6in. broad, green and very shiny above, glaucous-green beneath. Brazil, 1886. A noble, greenhouse Fern, of vigorous habit.

P. pictum (painted). *rhiz.* creeping, clothed with black scales. *sti.* smooth. *fronds* three-lobed, glabrous, tapering to the base; lobes oblong, rounded at apex, the middle one about 5in. long and 1in. broad. Polynesia, 1881. A free-growing species, allied to *P. Billardieri.* SYN. *Pleopeltis picta.*

P. Preslianum (Presl's). A synonym of *P. neriifolium.*

P. pulvinatum (cushion-like). A variety of *P. aureum.*

P. refractum (broken). *fronds* erect, pinnate, 1ft. long, 6in. broad; pinnæ lanceolate, auricled at base, sinuate, stiff, glossy, the lower ones conspicuously deflexed. *sori* abundant, black, scattered. Brazil, 1837. SYN. *Goniopteris refracta.*

P. rivale (brook-loving).* *rhiz.* stout, creeping, clothed with bright rusty-brown scales. *fronds,* barren ones 4in. to 6in. long, 2in. broad, cut down three-quarters of the way to the rachis into blunt lobes; fertile ones 1½ft. to 2ft. long, 6in. to 8in. broad, distinctly stalked, with blunt, entire lobes 2in. long and ½in. broad, reaching nearly or quite to the rachis; texture papery. *sori* in a single row on each side of, and close to, the midrib. North-east Himalayas. A distinct species. SYN. *Drynaria mollis.*

P. Robertianum. Limestone, Smith's, or Rigid Three-branched Polypody. A form of *P. Dryopteris.*

P. rostratum (beaked). *rhiz.* filiform, wide-creeping, scaly. *sti.* firm, naked, 1in. to 2in. long. *fronds* entire, 2in. to 4in. long, ½in. to 1in. broad, gradually narrowed to both ends, coriaceous. *sori* large, in single rows near the midrib. Himalayas. SYN. *Phymatodes rostrata.*

P. Schneiderii (Schneider's).* *rhiz.* thick, fleshy, clothed with silvery scales. *sti.* stiff, wiry, 6in. to 9in. long. *fronds* broadly triangular, about 9in. each way; pinnæ closely set, almost overlapping; pinnules cut into deeply-cleft, undulated lobes. A very handsome garden hybrid between *P. aureum* and *P. vulgare elegantissimum.* SYN. *Phlebodium Schneiderii.*

P. simplex (simple). A variety of *P. lineare.*

P. sphærocephalum (sphere-headed). A synonym of *P. angustatum.*

P. superficiale (superficial). *rhiz.* woody, wide-creeping, clothed with brown, shining scales. *sti.* 4in. to 6in. long, firm, naked, often curved. *fronds* 6in. to 12in. long, 1in. to 2in. broad, gradually narrowed to both ends, the edge entire. *sori* copious, scattered irregularly. Northern India (up to 6000ft.). Greenhouse. SYNS. *P. hymenodes, Phymatodes superficialis.*

P. tæniosum (ribbon-like). A synonym of *P. angustifolium.*

P. tricuspe (three-pointed). *rhiz.* stout, woody. *sti.* firm, erect, 6in. to 8in. long. *fronds* hastate, 2in. to 4in. each way, coriaceous, dark green above, densely matted beneath; central lobe broadly lanceolate, the lateral ones spreading, much smaller, auricled at base. *sori* minute, abundant, in rows of three or four between the main veins, and of nine to twelve between the midrib and the edge. Japan and Korea. Greenhouse. SYN. *Niphobolus tricuspis.*

P. urophyllum (tail-leaved). *rhiz.* creeping. *sti.* 2ft. or more in length, stout, erect. *fronds* 2ft. to 4ft. or more in length, 1ft. to 1½ft. broad, with a terminal pinna and usually several on each side, which are sometimes 1ft. long and more than 2in. broad, entire or slightly lobed. *sori* in two close rows, or sometimes in one row only. India, Australia, &c. SYN. *Goniopteris urophylla.*

P. varius (various). A variety of *P. adnascens,* having short, thick, fleshy fronds rising from a creeping rhizome.

P. Veitchii (Veitch's). *rhiz.* slender, creeping, clothed with pale brown scales. *sti.* very slender, less than 1in. long. *fronds* deltoid, thin, smooth, pale green; segments oblong, ¼in. to ½in. broad, obtuse, minutely notched, the lowest side ones reaching nearly to the rachis. *sori* globose, comparatively large, in a single row nearer the midrib than the edge. Japan, 1880. Greenhouse.

P. vulgare. Of this species some of the best varieties other than those enumerated in Vol. III. are: *cambricum, crenatum, Fowleri, grandiceps,* and *Prestonii.*

P. Xiphias (swordfish). *rhiz.* stoutish, creeping, with brownish scales. *fronds* glabrous, more than 1ft. long, elliptic-oblong or somewhat obovate, caudate-cuspidate, narrowed below to the point of attachment; veins pinnate, reticulated. *sori* round, medium-sized, dotted over nearly the whole back of the frond. South Pacific Islands. The specific name refers to the shape of the fronds. SYN. *Pleopeltis Xiphias.*

P. zosteræforme (ribbon-shaped). *rhiz.* wide-creeping, slender, fragile, scaleless. *sti.* short and very slender. *fronds* ribbon-like, 4in. to 6in. long, very narrow, with entire edges, gradually narrowed to the base, soft and papery, dark green. *sori* in irregular rows between the midvein and the margin. Tenasserim. SYN. *Phymatodes zosteræformis.*

POLYPORUS. The most destructive species belonging to this genus have already been dealt with in Vol. III., pp. 195 and 196. Little by way of prevention can be added to the information there given. The greatest care must, however, be exercised in collecting and burning the fungi as soon as they are noticed, and before they have a chance of ripening their spores. *Abies, Pinus,* Oaks, Alders, Willows, Birch, and many Orchard and Bush Trees (Gooseberries) are attacked by different species of *Polyporus,* and all are undesirable. They are usually wound-parasites, and therefore care should be exercised to dress any wounds made in trees with Stockholm tar, having first treated them with a solution of mercuric bichloride—a very *corrosive preparation, and a most dangerous poison.*

POLYPTERIS (from *polys,* many, and *pteris,* meant for *pteron,* a wing; in allusion to the pappus). ORD. *Compositæ.* A small genus (four species) of hardy or nearly hardy, scabrous-pubescent, North American herbs,

Polypteris—*continued.*

formerly included under **Palafoxia** (which *see* for culture). Flower-heads rose-purple or flesh-coloured, loosely corymbose-cymose or paniculate, pedunculate. Leaves undivided and mostly entire, petiolate; all the upper ones alternate.

P. Hookeriana (Hooker's). The correct name of *Palafoxia Hookeriana.*

P. texana (Texan). *fl.-heads* pink; florets about thirty, five-parted; involucral scales ten to twelve. *l.* lanceolate-linear, acuminate, three-nerved, puberulous. Annual. SYN. *Palafoxia texana.*

POLYSCIAS (from *polys*, much, and *skias*, shade; in allusion to the plentiful foliage). ORD. *Araliaceæ.* A genus comprising about eight species of stove, glabrous trees or shrubs, inhabiting the East Indies, the Indian Archipelago, and the South Pacific and Mascarene Islands. Flowers umbellate, racemose or paniculate; calyx truncate or repand-toothed on the margin; petals five to eight, valvate, free or cohering at apex; stamens as many as the petals; disk flat or rarely sub-conical; bracts scale-like or wanting. Leaves pinnate; leaflets coriaceous, usually ample. Only one species calls for description here. For culture, *see* **Trevesia.**

P. paniculata (paniculate). *l.* pinnate; leaflets usually seven, the terminal one 7in. to 9in. long, the others short-stalked, oblong, obtuse, shining, sub-coriaceous, deltoid or rather rounded at base, 4in. to 6in. long. SYN. *Terminalia elegans* (of gardens). This "has no more to do with the genus *Terminalia* than with a Cabbage" (G. C. 1887, ii., p. 366).

POLYSTACHYA. To the species described on p. 196, Vol. III., the following should be added:

P. Buchanani (Buchanan's). *fl.* yellowish, with faint traces of purple, small; scapes 1ft. long. *l.* about 6in. long. Eastern tropical Africa, 1889. Very similar to *P. luteola.*

P. bulbophylloides (Bulbophyllum-like). *fl.* white, sub-sessile, with an orange spot on the lip. Western tropical Africa, 1891. A minute species, with the habit of a small *Bulbophyllum.*

P. dixantha (of two yellows). *fl.*, sepals and petals ochreous; lip dark yellow, with purple side lobes and an orange-coloured callus. Western tropical Africa, 1882. A curious species.

P. grandiflora (large-flowered). The correct name of *P. galeata.*

P. imbricata (overlapping). *fl.* yellow and pink, small, disposed in a branched spike. *l.* about 3in. long. Stems as long as the leaves. Eastern tropical Africa, 1893.

P. Kirkii (Kirk's). *fl.* white, ½in. across, having the lip margined with purple; scape flattened, 3in. long. *l.* linear-oblong, 5in. long. Pseudo-bulbs narrow, 2in. long. Eastern tropical Africa, 1894.

P. Lawrenceana (Sir Trevor Lawrence's). *fl.* pale lilac and green, disposed in a simple raceme. British Central Africa, 1893. Allied to *P. Kirkii.*

P. leonensis (Sierra Leone). *fl.*, upper sepal and petals light green; lateral sepals suffused brownish-purple in the lower half; lip white, the lateral lobes suffused behind with light purple, and the front lobe, the central keel, and the basal part of lip white-mealy. May. Pseudo-bulbs arranged thickly in a string along the creeping rhizome. Sierra Leone, 1888.

P. Ottoniana (Otto's). *fl.* white, ½in. across; sepals having a purple median line; lip with a yellow blotch on the disk; peduncles one-flowered. *l.* in pairs, linear, Grass-like, the longer one 4in. long. Pseudo-bulbs clustered, ½in. long, prolonged into a slender stem 1in. to 1½in. long. South Africa, 1847.

P. usambarensis (native name). This is nearly related to *P. Kirkii*, but differs in its numerous leaves and in always having branched inflorescences. German East Africa, 1898.

P. villosa (villous). *fl.* pale green, with a white lip, small, hairy; scape erect, 3in. long. *l.* linear-lanceolate, 10in. long. Eastern tropical Africa, 1894.

P. Wightiana (Wight's). *fl.* yellow; sepals ⅛in. long; lip broader than long; panicle glabrous, with short branches. *l.* two or three, 4in. to 6in. long, ¾in. to 1in. broad. Stem 4in. to 6in. long. Malabar.

P. zambesiaca (Zambesi). *fl.* yellow and brown, borne on short scapes. *l.* lanceolate, 3in. long. British Central Africa, 1895.

POLYSTIGMA RUBRUM. *See* **Plum—Fungi.**

POLYXENA. *P. angustifolia* is the correct name of *Massonia angustifolia.*

POMACEOUS. Apple-like.

POMMELO. A popular but corrupt name for the fruits of *Citrus decumana*, now largely imported.

POMMERESCHIA (named in honour of Pommer Esche, Director of the Société d'Horticulture des États Prusse). ORD. *Zingibereæ.* A monotypic genus. The species is a quick-growing, stove, foliage plant much resembling a Phrynium in general habit. For culture, *see* **Zingiber.**

P. Lackneri (Lackner's). *fl.* golden-yellow, in a pedunculate spike 3in. to 5in. long, sub-distichous; lip cuneiform, bidentate or bifid. *l.* distichous, oblong-lanceolate, long-acuminate, 6in. to 10in. long. Rhizome tuberous, globular. *h.* 2ft. to 2½ft. Birma, 1895.

POMOLOGY. The section of horticulture relating to fruits.

POMPION. *See* **Cucurbita.**

POMPON. A word used of certain florists' flowers which are produced in tufts—Pompon Chrysanthemums for instance.

PONCELETIA (of Thouars). A synonym of **Spartina** (which *see*).

PONDS. In all gardens the effect is enhanced by the appearance of water, and where possible it should be introduced in the form of Ponds or streams. *See* **Aquatic Plants.**

PONDWEED, HORNED. *See* **Zannichellia.**

PONERA. In addition to the species mentioned on p. 197, Vol. III., the following have been introduced: *P. juncifolia*, *P. pellita*, and *P. prolifera*. *P. Kienastii* is also known as *Scaphyglottis Kienastii.*

FIG. 639. PONTEDERIA CORDATA.

PONTEDERIA. To the species, &c., described on p. 198, Vol. III., the following variety should be added. *See also* **Eichhornia** and **Monochoria.**

P. montevidensis (Monte Video). This is simply a form of the widely-distributed *P. cordata* (see Fig. 639). 1899.

PONTHIEVA. To the species described on p. 198, Vol. III., the following should be added:

P. grandiflora (large-flowered). *fl.* large; lateral sepals connate for nearly all their length, white, blotched green at base; dorsal sepal narrow-lanceolate; petals halberd-shaped, twisted, yellow, striped Indian-red; lip small, fleshy, red; scape 9in. high; raceme eight- to ten-flowered. *l.* broad, ovate, acute, dull green, hairy. Ecuador.

POPPY, MEXICAN. *See* **Argemone.**

POPULUS. To the species and varieties described on pp. 200-1, Vol. III., the following should be added:

P. alba macrophylla (large-leaved). A large-leaved form.

P. a. nivea (snowy).* *l.* covered with white tomentum on the under-side. One of the most ornamental of the white-leaved Poplars.

P. a. pyramidalis (pyramidal). The correct name of *P. a. Bolleana.* SYN. *P. Korolkowi.*

P. angustifolia (narrow-leaved). *l.* ovate-lanceolate, narrowed to the base, Willow-like, acute, glabrous, crenate-serrate. Branchlets terete, glabrous. Otherwise like *P. moniliformis* (of which it has been classed as a variety). North America. SYN. *P. salicifolia* (of Rafinesque).

P. balsamifera candicans variegata (variegated). *l.* large and showy, dark green, shaded with paler green, and heavily mottled and splashed with yellow. SYN. *P. ontariensis variegata.*

P. Bolleana (Bolle's). A synonym of *P. alba pyramidalis.*

P. canadensis aurea Van Geertii (Van Geert's golden). A synonym of *P. deltoidea aurea.*

P. canescens. According to the Kew authorities, this is now classed as a species, and not as a variety of *P. alba.*

P. deltoidea aurea (deltoid, golden). *l.* of a soft yellow, borne on bright red petioles, which impart a pleasing and distinct appearance, especially in autumn, when the colour deepens to orange. Young growths more or less touched with red. This variety is free in growth, and the foliage does not burn in hot summers. SYN. *P. canadensis aurea Van Geertii.*

P. Eugenii (Eugene Simon's). A garden variety of *P. monilifera.*

P. Korolkowi (Korolkow's). A synonym of *P. alba pyramidalis.*

P. monilifera Eugenii (Eugene Simon's). A tree of giant size. It "carries its limbs and shoots perpendicularly, forming a columnar head. It grows faster than other varieties, and is well adapted for planting as a solitary tree in parks or in groups, but not by roads or streets" (C. Mathieu, in R. G., Dec. 1, 1887).

P. monticola (mountain-loving). A form of *P. Tremula.*

P. ontariensis (Ontario). A synonym of *P. balsamifera candicans.*

P. pyramidalis (pyramidal). A variety of *P. nigra.*

P. salicifolia (Willow-leaved), of Rafinesque. A synonym of *P. angustifolia.*

P. Steiniana (Stein's). A garden hybrid, not in general cultivation. 1888. (R. G. 1888, p. 173, f. 37-8.)

P. tomentosa is a variety of *P. alba.*

P. trichocarpa (hairy-fruited). *fl.* having the ovary densely tomentose. *l.* ovate-lanceolate, cordate at base, 8in. long, 5in. broad, serrated, glabrous, pale beneath; petioles about 1½in. long, marked with red. Branches divaricate, reddish when young. California.

P. Viadri (Viadri's). This is something in the way of *P. nigra,* but branches lower down the trunk; the leaves are more cordate and paler beneath, the branches are more curved and more branched, and the tree is more fertile. Germany, 1890.

POROCARPUS. A synonym of **Timonius** (which *see*).

PORPHYROSTACHYS. A synonym of **Stenoptera** (which *see*).

PORRECT. Directed outwards or forwards.

PORTEA. According to the latest classification, *P. Legrelliana* and *P. tillandsioides* are transferred to **Ortgiesia** (which *see*), under the same specific names.

PORTENSCHLAGIA (named in honour of F. V. Portenschlag-Ledermeyer, an Austrian botanist, who died in 1821). ORD. *Umbelliferæ.* A monotypic genus. The species is a tall, much-branched, hardy perennial, slightly pubescent or almost glabrous. It thrives in any good garden soil, and may be propagated by seeds or by divisions.

P. ramosissima (much-branched). *fl.* yellowish-white, polygamous, produced in compound, many-rayed umbels; involucral bracts numerous, often membranous at the margins; petals hairy. *fr.* shortly hairy. *l.* ternately to pinnately decompound; ultimate segments ¼in. to 1in. long, filiform. Dalmatia, 1888.

PORTENSCHLAGIA (of Trattinick). Included under **Elæodendron** (which *see*).

PORTULACA. To the species described on p. 202, Vol. III., the following should be added:

P. grandiflora compacta (compact). Under this name is known a strain of compactly habited, brilliantly flowered varieties.

Portulaca—*continued.*

P. g. Regeli (Regel's). *fl.* of a peculiar salmon-buff tint, with a yellow centre, solitary. 1885. (R. G. 1209.)

P. Thellusonii. The compilers of the "Index Kewensis" regard this as a distinct species.

PORTULACARIA. This genus now embraces two species, but only one has been introduced to cultivation.

POSOQUERIA. To the species described on p. 203, Vol. III., the following should be added. One or two plants formerly included hereunder are now referred to **Randia.**

P. latifolia (broad-leaved). The correct name of *P. reroluta.*

P. macropus (large-footed).* *fl.* pure white, very sweet-scented, many in a corymb; corolla glabrous, the tube five times the length of the limb, the segments slightly acute. *l.* somewhat coriaceous, oblong, acute, rounded at base; petioles above 1in. long; stipules long, triangular, membranous. Brazil, 1896. Plant slightly hairy. (B. M. 7467.)

POSTERIOR. That side which adjoins the axis or main stem.

POT. *See* **Pots and Potting.**

POTHERBS. The cultivation of herbs is not so general as it should be, or as it was years ago. Usually any out-of-the-way spot in the garden is devoted to their culture, and the consequence is that they are rarely seen in good form. While a very rich soil is not desirable, one that is fairly good is the best. To have the flavour of the herbs properly developed, the plants should have the benefit of all the sun and light possible. Many herbs are easily propagated by seeds, and answer best raised in that way—Basil, Borage, Chervil, Fennel, Marjoram, Pot Marigold, Parsley, Savory, and even Sage, for instance. A few that succeed best propagated by cuttings or division are Mint, Thyme, Chives, Tarragon, Sorrel, &c.

POT MARIGOLD. *See* **Calendula officinalis.**

POTATO. To the varieties described on pp. 209-10, Vol. III., the following should be added:

Kidney-Shaped. NINETY-FOLD, an early variety and immense cropper; flesh white and very floury when boiled. RELIANCE, a new mid-season or late variety, of beautiful shape, full eyes, and of fine table quality. RINGLEADER, probably the earliest Potato in cultivation; flesh white and of excellent quality immediately the tubers are large enough to use. SIR JOHN LLEWELYN, tubers large, handsome, white, very floury and of good flavour when boiled; eyes prominent; enormous cropper, and good disease-resister; a most promising new mid-season variety. SUPREME, a new variety of great promise, being large, handsome, a great cropper, and of excellent quality. THE BRUCE, somewhat after the form of MAGNUM BONUM; a great cropper, fine quality, excellent disease-resister, and a long keeper. WINDSOR CASTLE, a popular variety of great merit; a great cropper, good keeper, handsome, and high quality.

Round. EPICURE, tubers large, white, and very floury when boiled; eyes shallow, and a great cropper; a mid-season variety. FLOURBALL, tubers large and handsome, and a very good keeper, also resisting disease well; of excellent quality, and a great cropper; mid-season or late. HARBINGER, tubers medium, white, and of excellent quality; a splendid early variety, and very prolific. SATISFACTION, tubers large, handsome, and fine for exhibition; a heavy cropper, and of first-class quality. TRIUMPH, tubers handsome and of high quality; a long keeper, and excellent for general crop.

POTATO SCAB. Though popularly associated with the Potato, this disease attacks other vegetable crops and particularly Beet. Of recent years, many investigations have been made in respect thereto in America. Amongst the preventive measures suggested is the use of corrosive sublimate in solution for steeping the seed in prior to planting. This dangerous poison, however, calls for such great care on the part of the operator that its use is hardly likely to become popular. Dr. Halsted says that ordinary flowers of sulphur dusted in the rows, at the rate of 200lb. to the acre, give excellent results; while Dr. Arthur, of Indiana, advocates a weak solution of formalin, 1 pint to 30 gallons of water. *See also* **Potato—Fungi,** Vol. III.

POTATO-STALK WEEVIL. *See* **Potato—Insect Pests.**

POTENTILLA. Including *Sanguisorba.* To the species described on pp. 211-2, Vol. III., the following should be added:

P. alchemilloides (Alchemilla-like). *fl.* white; petals roundish-obcordate, scarcely longer than the calyx. May to July.

Potentilla—*continued.*

l., radical ones palmately five- to seven-cleft; cauline ones three-lobed, the lobes oblong, scarcely toothed at apex. Stem firm, sub-erect. *h.* 1ft. Pyrenees.

P. aurea (golden). *fl.* saffron-yellow, loosely sub-corymbose; petals obovate; peduncles filiform. Summer. *l.*, radical ones palmately five-cleft, obscurely pilose, the lobes broadly obovate, toothed, cuneate; stipules lanceolate. Stem bending downwards. Alps.

P. a. ambigua (ambiguous). *fl.* larger than the type. *l.* ternately palmatisect; segments three-toothed. Stems ascending, few-flowered. Plant hairy.

P. colorata (coloured). A synonym of *P. nepalensis.*

P. davurica (Dahurian). A form of *P. fruticosa.*

P. davurica-fruticosa (hybrid). This is described in the "Kew Bulletin" as a hybrid "between the two species named"; but as, according to the "Index Kewensis," *P. davurica* is synonymous with, or a form of, *P. fruticosa*, the hybrid named is apparently a form of the latter species. 1896. It has the lobes of the leaves ternately or quinately pinnatisect.

P. flagellaris (whip-like). *fl.* yellow, solitary on axillary peduncles; petals obovate, entire. June. *l.* all five-cleft; leaflets lanceolate, acute, argutely serrated. Runners filiform, pubescent. *h.* 2in. Siberia, 1820.

P. Friedrichseni (Friedrichsen's). A garden hybrid between *P. fruticosa* and its form *davurica.*

P. Hippiana (Hipp's). *fl.* as in *P. pennsylvanica.* July. *l.*, leaflets narrow-oblong, approximate but scarcely crowded, silky above, silvery-canescent beneath, pinnatifid-serrated; stipules entire or somewhat toothed. *h.* 1½ft. North-west America. Formerly classed as a form of *P. pennsylvanica.*

P. hirta (hairy). *fl.* pale yellow, paniculate, more or less distant. *l.* palmately cleft into five to seven obovate, more or less toothed or pinnatifid lobes, the lateral ones pedate or cuneiform, three-toothed at apex. Stems ascending. South Europe.

P. micrandra (small-anthered). *fl.* dark yellow. *l.* pinnate. Japan, 1896. A bush about half as tall as *P. fruticosa.*

P. multifida (much-cleft). *fl.* yellow, as large as those of *P. verna*, corymbose. July. *l.* somewhat palmately bipinnatisect; lobules oblong-linear, revolute, hoary-tomentose beneath; stipules entire. *h.* 6in. Switzerland, Siberia, &c., 1759.

P. nepalensis pallida (pale). A variety with pale flowers, introduced by Messrs. Paul in 1890.

P. nitida. Of this plant there are many varieties, including *atrorubens*, with large rosy-purple flowers; *grandiflora*, with flowers more than 1in. across and of a soft pink; and *rosea*, deep rose-coloured flowers, darker towards the centre.

P. palustris (marsh-loving). The correct name of *P. Comarum.*

P. parvifolia (small-leaved). *fl.* yellow. July and August. Siberia, 1896. A dwarf, much-branched shrub.

P. recta (erect). *l.* palmately cleft; lobes broad, acutely toothed; stipules broad, coriaceous, more or less deeply toothed. Otherwise like *P. hirta.* *h.* 1ft. South Europe, 1648.

P. rupestris (rock-loving). Rock Potentil. *fl.* pure white, few, rather large, forming a loose, irregular corymb. May and June. *l.* chiefly radical, pinnate; leaflets five or rarely seven, ovate, toothed. *h.* 6in. to 10in. Europe (Britain), &c.

P. splendens (splendid). *fl.* having the sepals broader. *l.*, leaflets ternate or quinate, broader, and silky-pilose above. Otherwise like *P. alba.* France.

P. Valderia (Valderia). *fl.* yellowish-white; petals obovate, shorter than the calyx. Summer. *l.*, radical ones palmately five- to seven-cleft, with obovate-cuneiform, toothed tomentose lobes; cauline ones five-cleft; floral ones clustered-corymbose. Stem sub-erect, few-flowered. Alps of Piedmont.

Varieties. Many beautiful hybrids, Single, Double, and Semi-double, are now procurable. They vary through the shades of yellow to the darkest crimson. The following are noteworthy:

ARC EN CIEL, ATROSANGUINEA, BIGARRURE, CALIFORNICA, CANDIDAT, CAPELLA, CARNIVAL, CENDULLON, CHROMATELLA, CONGO, DRAP D'OR, ETNA, HOPWOODIANA, IMBRICATA, LA NUIT, LE VESUVE, MARS, MONT D'OR, PURPUREA PLENA, ROSEFLORA, ST. BLAISE, WILLIAM ROBINSON.

POTERIUM. *P. caudatum* and *P. spinosum* are now classed under **Bencomia** (which *see*).

POTHOS. To the species described on p. 213, Vol. III., the following should be added:

P. angustatus (narrowed). A synonym of *Anthurium angustatum.*

P. argenteus (silvery).* *l.* ovate, acuminate, inequilateral, of firm texture; upper surface silvery-grey, with an irregular band of deep green extending nearly the whole length of the midrib, and an irregular margin of the same colour. Borneo, 1887.

Pothos—*continued.*

P. argyræus is synonymous with *Scindapsus pictus.*

P. bifarius (bifarious). The correct name of *P. celatocaulis.* SYN. *P. flexuosus* (of gardens).

P. crassinervius (thick-nerved). A synonym of *Anthurium Hookeri.*

P. elongatus (elongated). *l.* ovate-elongated, 12in. to 14in. long, 6in. to 10in. broad, coriaceous, dark, shining green. 1885. This is useful for covering walls, &c. Probably a species of *Scindapsus.*

P. Enderianus (Ender's). *l.* of a sombre metallic black. Borneo, 1884.

P. flexuosus (bent). *l.* alternate, oblong, with an acuminate, deflexed apex, and a few alternate, elongated ribs. Stems flattened, rooting. 1884. This species is now classed under *Anthurium.*

P. flexuosus (of gardens). A synonym of *P. bifarius.*

P. Loureiri (Loureiro's). *l.* very variable, from ovate-acuminate to lanceolate; petioles leaf-like, linear-lanceolate to oblanceolate, 1½in. to 6in. long. Philippines and China. A glabrous climber.

P. nigricans (blackish). *l.* spreading, 5in. to 6in. long, shining blackish-green. 1886. An ornamental climber, suitable for covering pillars or trellis-work.

P. nitens (shining). *l.* ovate, acute, slightly and unequally cordate at base, dark, shining bronzy-purplish-green. Stems terete. Eastern Archipelago, 1887.

P. rubrinervis (red-nerved). A synonym of *Anthurium rubrinervium.*

P. scandens (climbing). *l.* very variable, 2in. to 4in. long, ½in. to 2in. broad, obovate or lanceolate, acute, apiculate, or acuminate, cuneate or rounded at base; petioles 1in. to 3in. long, the base half-amplexicaul. Stem as thick as the little finger, much-branched. India, 1821.

POTHUAVA. Included under **Æchmea** (which *see*). *P. nuilicaulis glabriuscula* (R. G., t. 1096) is a glabrous variety of *Æ. nudicaulis.*

POURRETIA. *P. nivosa* and *P. surinamensis* are garden names for *Tillandsia tectorum* and *T. pulchra* respectively.

PRAIRIE DOCK. *See* **Silphium terebinthaceum.**

PRAIRIE ROSE. *See* **Rosa setigera.**

PREMNA. *Gumira* is synonymous with this genus.

PREMORSE. *See* **Præmorse.**

PRESCOTTIA. The following changes in nomenclature from that adopted on p. 216, Vol. III., may be noted:

P. plantaginifolia (Plantain-leaved). The correct name of *P. plantaginea.*

P. stachyodes (spike-like). The correct name of *P. colorans.*

PRESTOEA CARDERI. The correct name of **Geonoma Carderi** (which *see*). (B. M. 7108.) *P. trinitensis* is grown at Kew, but is not in general cultivation.

PRICKLY CEDAR. *See* **Cyathodes acerosa.**

PRICKLY DATE PALM. *See* **Acanthophœnix.**

PRICKLY RHUBARB. *See* **Gunnera.**

PRICKLY THRIFT. *See* **Acantholimon.**

PRICKWOOD. *See* **Cornus sanguinea** and **Euonymus europæus.**

PRIESTLEYA. *P. ericæfolia* is referred by modern botanists to the genus **Amphithalea** (which *see*), under the same specific name.

PRIMULA. Those specially interested in Primroses should consult the "Report of the Primula Conference," forming Vol. VII., No. 2, of the "Journal of the Royal Horticultural Society," 1886. The most important of recent monographs, however, is the excellent one of Dr. Pax, of Breslau (1888), entitled "Monographische Uebersicht über die arten der Gattung Primula."

P. admontensis (Admont). *fl.*, calyx coloured, pubescent; corolla lobes lilac, cordate; scape erect, twice as long as the leaves, few-flowered. May. *l.* spathulate-ovate, dentate-serrate on the margins, glandular-pilose. Roots tufted. Styrian Alps, 1883. A hybrid between *P. Auricula* and *P. Clusiana*, found on limestone rock with its parents. SYNS. *P. Churchillii*, *P. Clusiana dentata.*

P. algida (cold). *fl.* purplish, shortly pedicellate; corolla salver-shaped, with deeply bifid, cordate lobes; scape three- or

Primula—*continued.*

four-flowered. Spring. *l.* ovate-lanceolate, glabrous, argutely serrated; petioles dilated. Caucasus.

P. alpina (alpine).* *fl.* brilliant violet-purple, large, in a many-flowered bunch. May. *l.* broadly spathulate or obovate, slightly toothed, covered, as well as the scape, with farina. Grisons. A hybrid between *P. Auricula* and *P. viscosa*, of great beauty, resembling the former in habit and distribution of the flowers. It is suitable for either the rock-garden or the flower-border. SYNS. *P. intermedia* (of gardens), *P. rhætica.*

P. amethystina (amethystine). *fl.* red-purple, three to six in an umbel; lobes entire or emarginate. June. *l.* resembling those of a Daisy, ovate-oblong; petioles winged, short, attenuated. Prairies, Yunnan, China. Plant glabrous, slightly farinose.

P. Arctotis (bear's-ear). *fl.* white or lilac-purple, smaller than in *P. pubescens* (to which this plant is closely allied), densely glandular-hairy. *l.* broadly spathulate-obovate, obtuse, toothed, green. 1886. "A pretty hybrid between *P. Auricula* and *P. hirsuta* (Kerner)." (It. G. 1193B.)

P. Auricula bellunensis (Belluno). *fl.* golden-yellow, large, on longish scapes, handsome, free. May and June. *l.* broadly ovate, obtuse; veins prominent; margins deeply and evenly serrated or indented, densely ciliated; petioles winged. Alps of Belluno.

P. A. dolomitica (Dolomite).* *fl.* of a uniform bright lemon-yellow, having a cylindrical tube and a broadly funnel-shaped limb of obovate, deeply emarginate segments; umbel eight- to ten-flowered; scape 2in. to 3in. long, terete, green. *l.* six to eight, broadly oblong, sessile, dull green, minutely hairy, forming a basal rosette, the margins white and minutely ciliated. Tyrol, 1884. A beautiful, alpine species

P. Balbisii (Baldo).* *fl.* shining golden-yellow, large, almost scentless; throat white, hairy. April and May. Baldo, and the Alps of South Tyrol, Styria, &c. This is distinguished from its near ally, *P. Auricula*, by its smaller, rounder, and more glossy leaves, which are entirely free of farina, so conspicuous in this section.

P. bella (handsome).* *fl.* violet-purple, two or three on a scape, sub-sessile, very large. Summer. *l.* long-petioled, ovate or sub-orbiculate. Habit of the Himalayan *P. uniflora*, but differing in the narrow, deep lobes of the leaves, in the shape of the calyx, and in the corolla, which has bifid lobes, the throat being closed with whitish hairs. Summit of Mount Tsang-Chan, Yunnan, 1884.

P. Berninæ (Bernina).* *fl.* rosy-purple, large, very free. April and May. *l.* smaller than in *P. viscosa*, with slightly crenated margins, entirely glandular-hairy, broad-clasping at base. Rocks, rich vegetable soil, Alps, growing with its parents. A natural hybrid between *P. v. hirsuta* and *P. viscosa*, of rare beauty.

P. biflora (two-flowered).* *fl.* pretty, deep rose, large, produced in pairs on short scapes, in great abundance. Spring. Tyrol. Habit and appearance of *P. minima*, but with larger leaves, sheathing at base, and distinctly serrated. The whole plant is not more than 1in. or so in height; a lovely little subject for the rockery, exposed. Sandy peat and loam. A hybrid between *P. Florkeana* and *P. minima.*

P. blattariformis (Blattaria-formed). *fl.* lilac, numerous, scattered; corolla lobes broadly obcordate; raceme 8in. to 12in. long. *l.* ovate or obovate, deeply crenate. Yunnan. A distinct and handsome species, clothed with short, papilliform hairs.

P. Boveana. The correct name is *P. verticillata.*

P. bracteata (bracted). *fl.* yellow, large; lobes obcordate, emarginate; calyx densely pubescent. March. *l.* petioled, rugose-oblong, obtuse, with attenuated base; petioles long, narrowly winged. Rhizome thick and woody, very characteristic. Shaded clefts of the limestone rocks, Lankong, Yunnan. Related to *P. bullata*, but differing chiefly in the absence of powder, in the shorter pubescence, and in the glandular hairs which cover the entire plant (absent in *P. bullata*).

P. bullata (inflated).* *fl.* golden-yellow, large; tube narrow at the throat, but broadening towards the calyx, half as long again as the limb; scapes tall, many-flowered. April. *l.* petiolate, lanceolate, firm, covered underneath with golden dust, reticulated and slightly inflated above; margins doubly dentate or crenate; petioles winged. Rhizome thick, woody, covered with scars above, divided at the base. Calcareous rocks, Yunnan. A very beautiful species, almost entirely covered with golden farina.

P. calliantha (beautiful-flowered). *fl.* intense violet-purple, five to ten in an umbel, large; calyx campanulate, the teeth narrow, purplish on the outside; bracts lanceolate, acuminate. June. *l.* oblong or obovate-oblong; petioles short, winged and attenuated. Rhizome short and thick. Shady places under Fir-trees on Mount Tsang-Chan, Tali, Yunnan. A charming species, nearly allied to *P. secundiflora*, differing in its more coriaceous leaves, covered underneath with a fine, golden powder, and finely crenulate instead of serrulate.

Primula—*continued.*

P. carniolica (Carniola).* *fl.* pale to deep blue, with a silvery-white throat; scape 3in. to 4in. high, with from three to ten flowers. April and May. *l.* 2in. long, ovate-lanceolate, tapering to the base, but again broadening at the clasping point, glabrous, shining on the upper surface. Rosettes large, loose. Alps of Carinthia, and Carniola. SYNS. *P. Freyeri, P. Jellenkiana. P. c. multiceps* has larger and deeper-coloured flowers.

P. cashmeriana (Kashmir). A form of *P. denticulata. See also* **P. kashmiriana.**

P. cernua (drooping). *l.* broadly ovate, short, petiolate; margins crenulate. Nearly allied to *P. capitata* and *P. erosa*, from which it differs in the flowers (produced in July) being stalked instead of sessile, and in the shape of its leaves and calyx. Chalky alpine pastures north of Tali, Yunnan, 1883.

P. Churchillii (Churchill's). A synonym of *P. admontensis.*

P. ciliata (ciliated). A variety of *P. viscosa.*

P. Clusiana dentata (toothed). A synonym of *P. admontensis.*

P. commutata (changed). A variety of *P. viscosa.*

P. confinis (neighbour). A variety of *P. viscosa.*

P. cortusoides grandiflora (large-flowered). A synonym of *P. c. Sieboldii.*

P. cridalensis (Cridala).* *fl.* rosy-purple, large. *l.* ovate, broadening again at base, slightly ciliated, and rough on the upper surface. Tyrol, 1884. A very distinct hybrid between *P. tyrolensis* and *P. Wulfeniana.* It is a fine plant for exposed rockeries.

P. daonensis (Val Daone). *fl.* pale rose, with a white centre, very large. May and June. *l.* obovate, glandular-hairy on both sides; margins serrated. Tyrol and Eastern Swiss Alps (6500ft. to 9800ft.), 1854. A small and very pretty plant; it does well on exposed places on rockery. SYN. *P. œnensis.*

P. decora (comely), of Sims. A form of *P. viscosa hirsuta.*

P. Delavayii (Delavay's). *fl.* intense purple, large, slightly hairy on the outside; peduncles eventually 1ft. or more high. August. *l.* broadly ovate or sub-orbicular, cordate. Damp situations in clayey soil (16,000ft.), Yunnan, China. A very interesting new species, constituting a new sub-genus on account of the large, laterally compressed seeds, and by the flowers appearing before the leaves, borne singly on bractless peduncles.

P. denticulata alba (white). A white-flowered variety, requiring the same treatment as the type. 1886.

P. d. pulcherrima (very pretty). *fl.* lilac-purple, in spherical heads 3in. or more across. February to April.

P. d. variegata (variegated). A garden variety, having the leaves bordered with white. 1889.

P. digenea (two-natured, *i.e.*, hybrid). A hybrid between *P. elatior* and *P. vulgaris*, nearly allied to the former. It is not distinct enough for general collections. Alps.

P. Dinyana (Dinyan's). *fl.* deep purple, handsome, produced in great abundance; corolla lobes narrow-obcordate; scapes 3in. to 6in. high, disposed in rather large heads of four to ten flowers. Spring. *l.* 4in. long, ovate-lanceolate, with ciliated and slightly dentate margins. Bavaria. A hybrid between *P. integrifolia* and *P. viscosa*, most nearly allied, however, to the first parent, from which it takes its habit. It is a very useful plant for the rockery, doing best in rather shady nooks, in rich, vegetable soil.

P. discolor (two-coloured).* *fl.* lilac or violet-purple, with silvery eye, large; scape 3in. to 4in. high, covered with farina. April. *l.* ovate, with dentate margins, sparingly covered with glandular hairs. Western and South Tyrolese Alps (in fissures of granite rocks, 6000ft. to 7000ft.). A hybrid between *P. Auricula* and *P. daonensis*, resembling the former in habit. It is a charming plant, easily managed in the open border. A possible parent of the garden Auriculas.

P. dolomitica (Dolomite). A variety of *P. Auricula.*

P. dryadifolia (Dryas-leaved). *fl.* violet, three to five in an umbel, sub-sessile; calyx campanulate; bracts broadly ovate. July. *l.* ovate or sub-cordate; petioles short, winged. Rhizome long, slender. Glacier of Li-Kiang, Yunnan. Habit much resembling that of *Dryas octopetala*, well characterised by its leaves and the shape of its bracts.

P. Dumoulinii (Dumoulin's). *fl.* deep rose-coloured, large for the size of the plant; corolla lobes obcordate; scapes not more than 2in. high, producing numerous flowers, in compact bunches. Spring. *l.* more spreading, larger, and broader than in *P. minima* (which this plant resembles in habit), with numerous small pits on the upper surface. Collected on the Mountain Trate, Indicarien, Austria, 1877. A robust-growing, free-flowering hybrid between *P. minima* and *P. spectabilis*, with the characters of both parents distinctly shown in robust specimens. It is pretty for rockeries, doing well wherever *P. minima* grows. Sandy peat, in rather dry positions.

P. elatior calycantha (calyx-flowered). A pretty, garden form, having a large, leafy, frilled and lobed calyx, which is coloured like the corolla. 1886. (R. G. 1886, p. 242, *t.* 17.)

Primula—*continued.*

P. e. intricata (perplexing). A very distinct, Continental form of our wild Oxlip, but not worth adding to general collections.

P. elliptica (elliptic). *fl.* four to twelve in a loose umbel, violet or bluish-purple, with broad, deeply-cleft lobes; tube variable in length. June and July. *l.* not mealy, 2in. long, ovate or ovate-oblong, narrowed into a broad petiole, with sharply-toothed margins, dark green and shiny above. *h.* 6in. to 12in. Near Thibet, Cashmere, &c. (8000ft. to 12,000ft.). Habit of *P. rosea.*

P. Elwesiana (Elwes').* *fl.* dark purple, solitary, very large; calyx five-parted, the segments ovate-lanceolate; scape 6in. to 7in. high. *l.* 2in. to 3in. long, oblanceolate, acute, entire; petioles broadly winged. Rootstock stout, with broad, fleshy, leafy scales. Sikkim-Himalaya. A remarkable and beautiful species. (G. C. n. s., xxi., p. 645.)

P. Escheri (Escher's). *fl.* rose or lilac-purple, large; scapes 2in. to 3in. high, bearing several flowers. April. *l.* 1in. to 2in. long, half as broad, ovate-lanceolate, the margins cartilaginous, serrated. 1880. Whole plant glandular-hairy. Habit of *P. integrifolia*, in close, dense, tufty rosettes of numerous leaves. A hybrid between *P. Auricula* and *P. integrifolia*, growing with its parents.

P. Facchinii (Facchin's).* *fl.* rosy-purple, rather large, two or three to each scape. May and June. *l.* spathulate, gracefully curved, and usually deeply crenated at apex, bright green; rosettes compact. Granite region, Southern Tyrol. An extremely graceful and useful plant, hybrid between *P. minima* and *P. spectabilis*, most nearly allied to *P. minima*. It is the easiest to manage of the newer hybrids, and a profuse blossomer.

P. farinosa alba (white).* A white-flowered but scarce variety.

P. farinosa *var.* (of Scopoli). A synonym of *P. longiflora.*

P. finmarchica (Finmark). A variety of *P. sibirica.*

P. floribunda grandiflora (large-flowered).* A variety having much larger flowers than in the type. 1896. (R. G. 1424.)

P. Florkeana (Förke's).* *fl.* deep lilac or lilac-purple; corolla lobes obovate, deeply bifid; scape 2in. high, bearing several flowers, surrounded by a leafy involucre. Spring. *l.* cuneate or tongue-shaped, broad at the apex, dentate or serrated, about 1in. long. Growing with its parents on the Swiss and Tyrolean granite Alps (7000ft.). A charming little hybrid between *P. glutinosa* and *P. minima*; very free and vigorous. SYN. *P. minima hybrida.*

P. Forbesii (Forbes's).* *fl.* pale lilac, with a yellow throat, in three to six whorls; scape 16in. to 20in. long. *l.* small, petiolate, oblong or ovate, toothed, pubescent. Yunnan, China, 1883. A Primrose midway between *P. cortusoides*, which it resembles in the leaves, and *P. farinosa*, which it resembles in the flowers. Half-hardy, and best treated as an annual. (B. M. 7246; G. C. 1883, xix., p. 113, f. 17; R. H. 1893, f. 67.)

P. Forsteri (Forster's). *fl.* deep rose-coloured, with white throat, large, produced two or three on each scape, and usually twice in the year—early spring and autumn—rarely failing. *l.* three to four times larger than in *P. minima*, deeply and sharply serrated at apex, hairy on the margins and upper surface. Padaster in Gschnitz Valley, Central Tyrol, 1880. A hybrid between *P. minima* and *P. viscosa hirsuta.* Habit and leaves resembling *P. minima*, but very robust, and having the hairs of the latter parent.

P. Freyeri (Freyer's). A synonym of *P. carniolica.*

P. frondosa (leafy). *fl.* of a pleasing blue; pedicels very slender, lax, over 1in. long; scape 2in. to 6in. high, erect. June. *l.* numerous, cuneate-oblong or obovate, lanceolate or oblong, sometimes 9in. long, narrowed to the petioles. Thracia. Plant highly glabrous.

P. Gambeliana (Gambel's). *fl.* purple, the mouth annulate; corolla lobes round, emarginate; scape few-flowered. *l.* 1in. in diameter, orbicular-cordate, toothed, glabrous. Buds mealy. Temperate Himalayas. Similar to *P. rotundifolia*, but with fewer and larger flowers. (G. C. n. s., xxi., p. 545.)

P. geraniifolia (Geranium-leaved). *fl.* many, in a solitary, terminal umbel, with sometimes a whorl below the umbel, spreading and drooping; corolla pale purple, glabrous, the tube a little longer than the pubescent calyx, rather inflated and contracted at the yellow, annulate mouth; scape erect, 6in. to 10in. long, softly hairy. May. *l.* spreading, 1in. to 1½in. in diameter, orbicular and deeply cordate, pale yellow-green, membranous, hirsute on both surfaces, eleven- to fourteen-lobulate. Rootstock short. Eastern Himalaya, 1837. (B. M. 6984.)

P. glacialis (glacial).* *fl.* violet, three to five in an umbel. June. A charming little species, distinguished by its long calyx, divided four-fifths of its entire length into very narrow lobes, and by its corolla, with narrow, quite entire divisions. Nearest *P. nivalis* (of Pallas, not of gardens) and *P. Fedschenkoi.* It differs in its larger, more deeply-lobed calyx. Clefts of rocks on the Glacier of Li-Kiang, Yunnan, China.

P. Heerii (Heer's). *fl.* purple, large, several on a scape. April. Habit low, close, and tufty, like that of *P. integrifolia*, from which the leaves differ in being 1in. to 2in. long, ovate-lanceolate, slightly toothed and hairy. A hybrid between *P. viscosa hirsuta* and *P. integrifolia*, growing with its parents.

P. hirsuta (hairy). A variety of *P. viscosa*

P. Hornemanniana (Hornemann's). A synonym of *P. stricta.*

P. Hugueninii (Huguenin's). *fl.* fine, deep purple, large; scape 2in. to 3in. high, bearing several flowers. April and May. *l.* 1in. long, obovate- or ovate-lanceolate, toothed from the middle of the blade to the apex; margins covered with short hairs, slightly glutinous. 1880. Habit tufty, like that of *P. integrifolia*; rosettes close and large. A hybrid between *P. glutinosa* and *P. integrifolia*, growing with its parents.

P. humilis (dwarf). A synonym of *P. pusilla*, of Wallich.

P. Huteri (Huter's).* *fl.* deep violet; limb shorter than the tube; scape glutinous, with three or four oblong bracts. May. *l.* long-spathulate, with eleven to fifteen short, broad, triangular teeth, thickened at the tips like small bladders. Tyrol, &c. A pretty little hybrid between *P. Florkeana* and *P. glutinosa*; habit of the latter, not more than 1in. high.

P. imperialis (imperial). *fl.* of a rich Cowslip-yellow, tinged with orange; scape erect, 3ft. to 4ft. high. *l.* 1½ft. long, 5in. broad. Java, 1891. Greenhouse. (B. M. 7217; Gn. 1891, t. 823; J. H. 1891, xxiii., f. 1.) This, the true *P. imperialis*, differs specifically from the Himalayan Primrose figured in B. M. 6732 as *P. prolifera.*

P. intermedia (intermediate). A garden synonym of *P. alpina.*

P. involucrata cærulea (blue). A variety with bluish flowers.

P. Jæschkiana (Jæschke's), of Kerner. A synonym of *P. Stuartii purpurea.*

P. japonica splendens (splendid).* A beautiful variety with crimson flowers, best grown as a semi-aquatic.

P. Jellenkiana (Jellenk's). A synonym of *P. carniolica.*

P. kashmiriana (Kashmir). A form of *P. sibirica. See also* **P. cashmeriana.**

P. Kerneri (Kerner's). *fl.* of a reddish-violet colour, with a yellowish-white throat; calyx campanulate; teeth twice as long as broad, elliptic, and pointed; scapes stout, 2in. to 4in. high, bearing several flowers. April and May. *l.* bright green, slender, broadly spathulate-obovate, dentate-serrate. Styria and Eisenhut, near Turrach, in Stieirmark, in company with *P. Goblii.* Habit of *P. viscosa*, the entire plant covered with black, glandular hairs. A hybrid between *P. Auricula* and *P. villosa.*

P. Kitaibeliana (Kitaibel's). A variety of *P. spectabilis.*

P. latifolia (broad-leaved). A variety of *P. viscosa.*

P. Lebliana. *fl.* rose-purple, large and fine; scape 3in. to 4in. high, three- to eight-flowered. April and May. *l.* ovate-lanceolate, 1in. to 2in. long, in close rosettes; upper surface glabrous, shiny; margins cartilaginous, dentately serrated. 1880. Habit of *P. Wulfeniana*, which it most nearly resembles, although the traces of the other parent are most distinct both in leaves and flowers. A hybrid between *P. Auricula* and *P. Wulfeniana*, growing with its parents.

P. longiflora (long-flowered).* *fl.* brilliant violet or purple, over ½in. in diameter, enveloped in farina; tube three times longer than the calyx divisions, the latter triangular, pointed; scapes 1ft. to 1½ft. high, stout, the bracts surrounding the umbel larger and broader than in *P. farinosa.* May and June. *l.* only slightly farinose underneath, 1in. to 2in. long, ovate-oblong, pointed, irregularly notched or toothed, slightly dilated at base. Grassy regions of the high Alps (5000ft. to 7000ft.). Somewhat resembling *P. farinosa* in habit and general appearance. SYN. *P. farinosa* var. (of Scopoli). *P. l. Krattli* is said to be a hybrid between *P. farinosa* and *P. longiflora*, found in 1876.

P. longobarda (Lombard). *fl.* rose-purple, large, several on a scape; calyx campanulate; teeth short and obtuse. April. *l.* not glutinous, obovate-lanceolate, acute, hardly punctured. Calcareous and granite regions, South Tyrol, Lombardy. A very distinct plant, nearest to *P. calycina*, of which it may turn out to be a variety; habit much the same.

P. magiassonica (Mount Magiassone). *fl.* large, like those of *P. spectabilis.* May. *l.* ovate or obovate, 1in. long and about as broad, glabrous; upper surface closely pitted; margins cartilaginous, slightly serrated. 1880. Habit and disposition of *P. spectabilis*; rosettes close, tufty. A hybrid between *P. spectabilis* and *P. minima*, growing with its parents.

P. marginata grandiflora (large-flowered).* *fl.* of a rich plum-purple, with white mealy eye. A fine variety.

P. minima hybrida (hybrid). A synonym of *P. Florkeana.*

P. m. pubescens (downy), of Josch. A synonym of *P. Sturii.*

P. minutissima (very minute).* *fl.* bright purple, ¼in. to ½in. in diameter (large for the size of the plant); lobes bifid; scape hardly rising above the leaves, bearing one to three flowers. June. *l.* densely crowded, dark green, oblanceolate-acute or obtuse, toothed, mealy beneath. Alpine Himalaya. A pretty little species, forming large patches of rosettes, each ½in. to 1in. in diameter.

Primula—*continued.*

P. mistassinica is a form of *P. farinosa.*

P. multiceps (many-headed). A variety of *P. carniolica.*

P. Mureti (Muret's). A synonym of *P. Muretiana.*

P. Muretiana (Muret's). *fl.* rich, deep purple, many in a head, large, opening earlier than those of *P. integrifolia.* April and May. *l.* broader than in *P. Dinyana,* entire or slightly toothed, viscous-hairy. High Alps. Closely allied to *P. Dinyana,* and also a hybrid between *P. integrifolia* and *P. viscosa,* taking more after the latter than the former parent. Rich, deep loam, in a cool position. SYN. *P. Mureti.*

P. muscoides (Moss-like). *fl.* purplish, small, solitary; corolla segments deeply two-lobed. *l.* sessile, obovate, oblong, or sub-spathulate, dilated at the base; margins coarsely toothed. Sikkim-Himalaya. Plant densely tufted, small, not mealy. (G. C. n. s., xxi., p. 545.)

P. m. tenuiloba (slender-lobed). *fl.*, corolla tube narrower, slightly hairy; lobes very narrow, deeply cleft, with narrow lobules.

P. Nelsoni (Nelson's). A variety of *P. viscosa.*

P. nivalis (snowy), of Pallas. *fl.* lilac-purple; calyx tube oblong or broadly lanceolate, shorter than the oblong capsule; corolla lobes oblong or oval, entire, three to four lines long, the tube funnel-formed; umbels consisting of two to ten flowers on scapes 3in. to 18in. high. Spring. *l.* 1in. to 6in. long, thickish, perfectly glabrous and often mealy on the under-surface; margins often entire but usually closely denticulate. Caucasus, &c., 1790. (R. H. 1878, p. 12.) The description of *P. nivalis* given on p. 221, Vol. III., is that of *P. pubescens alba* (SYNS. *P. nivalis* and *P. nivea,* of gardens), and should be replaced by the above.

P. nivalis (of gardens). A synonym of *P. pubescens alba.*

P. nivea (snowy), of gardens. A synonym of *P. pubescens alba.*

FIG. 640. PRIMULA OBCONICA.

P. obconica. The following are varieties of the useful and well-known type (see Fig. 640): *fimbriata,* with a fringed corolla; and *rosea,* a rose-coloured form. 1897.

P. obovata (obovate). *fl.* pale rose or purple, several on a stout scape. April and May. *l.* 1in. long, ovate, obtuse, glandular-hairy above; margins evenly and distinctly serrated, glandular-hairy. Valmenon. A hybrid between *P. tyrolensis* (of which it is a near ally) and *P. Balbisii,* growing with its parents.

P. Obristii (Obrist's). A hybrid between *P. Balbisii* and *P. Auricula*; very near the former, but more robust.

P. obtusifolia (obtuse-leaved). *fl.*, calyx dark brown when not mealy, campanulate; corolla claret or almost port-wine coloured, rarely yellow, the mouth orange-yellow, the lobes broadly obcordate; scape 6in. to 10in. high. May and June. *l.* variable, 2in. to 5in. long, usually obtuse, the under-surface naked or mealy. Himalayas, 1837. (B. M. 6956.) There is a good variety of this, *Gammieana.*

P. œnensis (a mistake for Val Daone). A synonym of *P. daonensis.*

P. Olgæ (Olga's).* *fl.* pretty rosy-lilac or purple, resembling those of *P. sibirica*; corolla lobes obcordate, bifid; scape 3in. to 4in. high, terminating in a few-flowered umbel. Spring. *l.* ovate-oblong, tapering to a narrow, winged petiole, glabrous, shiny on both sides. Turkestan, 1887. Said to be nearly allied to *P. nivalis* (of Pallas), and a great acquisition.

P. pallida (pale). A very slight form of *P. viscosa hirsuta.*

P. pedemontana (Piedmont). A form of *P. viscosa.*

P. petiolaris nana (petiolate, dwarf). *fl.* lilac-purple, 1in. in diameter, with a white and yellow eye; corolla lobes obcordate, entire or toothed; scape very short. *l.* almost sessile, obovate, oblong, or spathulate. Himalayas, 1839. Half-hardy. A dwarf variety of an exceedingly variable species. (B. M. 7079B.)

P. Peyritschii (Peyritsch's). A hybrid between *P. Auricula* and *P. viscosa.* It may be treated as a very robust form of the latter species. Alps. SYN. *P. viscosa major* (of English gardens).

P. pinnatifida (pinnatifid). *fl.* violet; tube long, cylindrical; lobes entire. July. *l.* long-petiolate, winged, ovate or oblong, the base entire, cuneate, pinnatifid. Glacier of Li-Kiang, Yunnan, China. The flowers of this species recall those of *Erinus alpinus,* but are, of course, larger.

P. Plantæ (Planta's). *fl.* rose-purple, rather large. April and May. *l.* ovate, pointed, finely serrated from the middle to the apex, entirely covered with brown, glandular hairs. 1880. Habit robust, like that of *P. viscosa hirsuta*; rosettes close and tufty. A hybrid between *P. viscosa hirsuta* and *P. daonensis,* growing with its parents.

P. Poissoni (Poisson's).* *fl.* rich purple, ½in. to ¾in. in diameter, disposed in whorls. July to September. *l.* narrowly oblong, with a broad, dilated, clasping base; margins serrated. *h.* 4ft. to 6ft. Yunnan, China, 1889. Allied to *P. pralifera.* (B. M. 7216; Gn. 1891, 827; R. H. 1891, 491.) A very free species.

P. Portæ (Porta's). *fl.* wine-red, large, several on a scape. April and May. *l.* small, viscous, obovate, serrated only on the upper half. South Tyrol, 1873. A hybrid between *P. Auricula* and *P. daonensis.* It is allied to *P. discolor,* but it differs in the glandular-hairy scape and in the absence of farina on the calyx and corolla. A useful little plant for rockeries.

P. pubescens alba (white). *See* description under **P. nivalis,** on p. 221, Vol. III. This plant has been long known in English gardens under the names of *P. nivalis* and *P. nivea,* and has been supposed to be a variety of *P. viscosa.* It is, however, not viscid, and is usually mealy, which not only excludes it from *P. viscosa,* but also from *P. v. hirsuta,* under which it is often quoted.

P. pulchra (beautiful). *fl.* purple, large for the size of the plant (1in. in diameter); tube funnel-shaped. *l.* oblong or ovate-oblong, glaucous beneath; base round or cordate; margins wavy. Sikkim-Himalaya. Plant glabrous, not mealy. (G. C. n. s., xxi., p. 545.)

P. pumila (dwarf).* *fl.* rosy-purple, large, free; calyx tubular-campanulate, the teeth ovate; scape about 1in. high, glandular-hairy, two- or more-flowered. April and May. *l.* cuneate, ½in. to ¾in. long, half as broad, with seven to nine large, triangular teeth at the apex; margins covered with small, sessile glands. Southern Tyrol, &c. (6000ft. to 7000ft.). This hybrid between *P. minima* and *P. daonensis* is well named, being amongst the smallest of its class. It is nearly allied to *P. minima* in habit and general appearance.

P. purpurea (purple), of Royle. A variety of *P. Stuartii.*

P. pusilla (weak), of Wallich. *fl.* violet-purple, sessile, about 1in. in diameter; calyx hoary; tube short, terete; lobes oblong, obtuse or acute; scape slender, one- to four-flowered. Spring. *l.* ½in. to 1in. long, spathulate-oblanceolate, pinnatifidly toothed. Central and Eastern Himalayas (13,000ft. to 16,000ft.). Plant densely tufted, hoary. (B. M. 7079A.) This must not be confounded with *P. pusilla,* of Goldie. SYN. *P. humilis.*

P. Reidii (Reid's).* *fl.* ivory-white, fragrant, very shortly pedicellate, nodding; calyx ample, glandular-ciliate; corolla tube as long as the calyx, the lobes broadly oblong, connivent in a globe, bilobed at apex; scape rigid, many-flowered. May.

Primula—*continued.*

l. oblong or oblong-oblanceolate, deeply lobulate-toothed or crenate, narrowed into the petioles, bullate, loosely silky-villous. Sikkim-Himalaya, 1886. (B. M. 6961; G. C. n. s., xxvi., p. 691.)

P. reticulata (netted). *fl.* yellow; corolla tube funnel-shaped, the much-exserted mouth not annulate; scape 6in. to 12in. high. Late spring. *l.* oblong-cordate, obtuse, doubly crenate, reticulated, glaucous beneath, on long petioles. Central and Eastern Himalayas (11,000ft. to 15,000ft.), 1837. Plant glabrous, mealy or not. A close ally of *P. sikkimensis.*

P. rhætica (Rhetian Alps). A synonym of *P. alpina.*

P. rosea grandiflora (large-flowered). A large-flowered form having bright rose flowers. *h.* 9in.

P. rotundifolia (round-leaved). *fl.* pale purple or pink, with a yellow throat; corolla tube twice as long as the calyx; limb flat, 1in. in diameter; inflorescence puberulous and mealy; scape 8in. to 12in. high. June. *l.* 1in. to 4in. in diameter, orbicular-cordate, crenately toothed; petioles 6in. to 12in. long. Buds in resting season densely covered with sulphurous meal. Temperate Himalayas (12,000ft. to 14,000ft.).

P. Rusbyi (Rusby's). *fl.* deep purple, with a yellow eye; calyx mealy-white at base, the meal running up between the lobes in acute, tooth-like patches; corolla lobes obcordate; umbels six- to ten-flowered; scapes 5in. to 10in. high. Spring. *l.* oblong-spathulate, denticulate. New Mexico, 1881. A distinct species. (B. M. 7032.)

P. salisburgensis (Salzburg). *fl.* reddish-purple, rather large, several in a head; bracts oblong, as broad as the calyx teeth; scape not viscous. April and May. *l.* cuneate, the upper quarter of their margins set with seven to nine acute, triangular teeth, the tips blunt. A hybrid between *P. glutinosa* (which it resembles in habit) and *P. minima*, growing with its parents. It should be grown in peaty soil, sphagnum, &c.

P. scotica is a form of *P. farinosa.*

P. secundiflora (side-flowering).* *fl.*, calyx purplish, the lobes deltoid, lanceolate, acute; corolla intense violet, the tube cylindrical, the lobes broadly obovate, entire. July. *l.* papery, covered with golden dust, oblong or ovate-oblong; margins equally serrulate; petioles broadly winged, attenuated. Glacier of Li-Kiang, Yunnan, China. Plant glabrous, allied to *P. sikkimensis.* It is one of the most beautiful of the Primulas.

P. septemloba (seven-lobed). *fl.*, calyx campanulate, glabrous or nearly so, divided to the middle into equal, lanceolate, acute divisions; corolla purple, 1in. long, the limb concave, the lobes obovate, emarginate. July. *l.* nearly round, deeply cordate at base, deeply seven-lobed; lobes broadly ovate, obtuse. Rhizome slender, horizontal. Forests at the base of the Glacier Li-Kiang, Yunnan, China. Entire plant covered with soft, pliant, jointed hairs. Nearly allied to *P. mollis.*

P. serratifolia (serrate-leaved). *fl.* golden-yellow, five to ten in an umbel, large; scapes longer than the leaves. June. *l.* thin, papery, oblong or obovate towards the long and winged petioles; margins acutely denticulate or erose. Prairies, Yunnan. This is a near ally of *P. obtusifolia*, entirely glabrous, and without meal. It must not be confounded with the obscure European *P. serratifolia*, a hybrid between *P. minima* and *P. Wulfeniana.*

P. sibirica finmarchica (Finmark).* *fl.* dark lilac; corolla tube short; pedicels much longer than those of *P. farinosa.* *l.* lanceolate, not farinose beneath. Mountains of Scandinavia, 1892. A pretty rockery plant.

P. Sieboldii (Siebold's). A form of *P. cortusoides.*

P. similis (like).* A hybrid between *P. Balbisii* and *P. Auricula*, apparently about intermediate between them. It is a fine, robust plant for the rockery or flower-border. April and May. Indicarien and Petrasch, Styria.

P. soldanelloides (Soldanella-like). *fl.* white, large, nodding; scape one-flowered; corolla lobes obcordate. *l.* ¼in. to ½in. long, petioled, ovate, runcinate-pinnatifid. Sikkim-Himalaya. Plant quite glabrous, not mealy. (G. C. n. s., xxi., p. 545.)

P. sonchifolia (Sonchus-leaved). *fl.* violet. June. *l.* glabrous, oblong or obovate-oblong, obtuse, attenuated, sinuate, resembling those of *Sonchus asper*; petioles broadly winged. Slopes of the mountain Tsang-Chan, China. Nearly allied to *P. obtusifolia*, but distinguished by its almost runcinate leaves.

P. spectabilis Kitaibeliana (Kitaibel's).* *fl.* rosy-purple, larger than in the type, several on each scape, produced in abundance. April and May. *l.* ovate, pointed, serrated, densely covered with short, white hairs. Sub-alpine stations in Croatia. Habit of *P. spectabilis.* A charming plant for the rock-garden, on sunny, exposed places. It requires rich, loamy soil.

P. spicata (spiked). *fl.* violet, spicate, resembling those of *P. uniflora.* June. *l.* papery, pale green, ovate or ovate-oblong, obtuse, attenuated at base, doubly crenate; petioles narrowly winged. Elevated pastures of Tsang-Chang, above Tali, Yunnan, 1884. A very remarkable species, with unilateral, spicate flowers, a form of inflorescence unique amongst Primulas.

Primula—*continued.*

P. stricta (erect). *fl.* pink; corolla lobes obcordate. April. *l.* ovate-lanceolate or lanceolate, undulated or rarely loosely crenate, obtuse, highly glabrous. Otherwise like *P. farinosa.* Scandinavian Mountains, 1822. SYN. *P. Hornemanniana.*

P. Stuartii purpurea (purple). *fl.* pale or deep purple, often in two whorls; lobes obcordate or bifid, entire. Summer. *l.* rarely toothed, broad, white or yellow beneath. Sub-alpine and Alpine Himalayas. Habit and leaves resembling *P. Stuartii.* SYN. *P. Jæschkiana* (of Kerner).

P. Sturii (Stur's). *fl.* rose-purple, large and free. April and May. *l.* about 1in. long, wedge-shaped, glandular-hairy, coarsely toothed at the almost truncate apex. Steiermark, near Eisenhut, 1856. A hybrid between *P. minima* and *P. viscosa*, with the habit and general appearance of the former, but freer and more robust. SYN. *P. minima pubescens* (of Josch).

P. tenella (tender). *fl.* bluish-white, large, solitary, erect; corolla lobes obcordate. *l.* numerous, mealy all over, cuneate and entire below the middle, toothed above. Eastern Thibet. Whole plant 2in. to 2½in. high, glabrous. (G. C. n. s., xxi., p. 545.)

P. tenuiloba (slender-lobed). A variety of *P. muscoides.*

P. Traillii (Traill's).* *fl.* blush, tinted with white, borne on tall, slender scapes. Himalayas, 1897. A new species, very closely allied to *P. involucrata.* (G. C. 1897, xxii., p. 263, f. 80.)

P. uniflora (one-flowered).* *fl.* pale lilac, larger than the whole rosette of leaves; corolla lobes shallow, unequally toothed; scape slender, one- or two-flowered. *l.* few, ½in. long, orbicular or broadly ovate, pinnatifidly crenate. Sikkim-Himalaya. A charming little species. (G. C. n. s., xxi., p. 545.)

P. Venzoi (Venzo's). *fl.* pale purple, one to three to a scape, 1in. in diameter, very pretty; petals deeply cut. April. *l.* 1in. to 1½in. long, ovate-lanceolate, pointed; margins rough, cartilaginous, slightly indented; surface hairy and densely pitted. Tyrol, &c. Habit tufty, in dense rosettes. A hybrid between *P. tyrolensis* and *P. Wulfeniana*, nearly allied to the latter.

P. verticillata is the correct name of *P. Boveana.*

P. vinciflora (Periwinkle-flowered). *fl.* purplish-violet, 1½in. in diameter; tube long, pubescent, swollen at the base; corolla lobes obcordate; scape hairy, one-flowered. *l.* cuneate-oblong, ciliated, covered with reddish, sessile glands. Yunnan, China. (G. C. 1887, i., p. 575, f. 108.)

P. viscosa ciliata (fringed). A very robust form, with larger flowers, produced in greater abundance than in the type.

P. v. commutata (changed). *fl.* bright rose, large. May and June. *l.* broadly ovate or obovate, viscous-hairy; margins entire or slightly toothed. Porphyritic region, Eastern Alps.

P. v. confinis (neighbour). *fl.* bright, deep rose, large, very handsome, approaching those of *P. v. ciliata*, but larger and more vigorous. May and June. *l.* small, obovate, toothed, viscous-hairy. Alps.

P. v. hirsuta (hairy).* *fl.* pale lilac, with a bright silvery eye, large. Spring. Eastern Switzerland, Tyrol, &c. (6000ft. to 7000ft.). A charming variety, forming large rosettes of ovate or obovate leaves, deeply and sharply toothed, and densely covered with soft hairs. *P. decora*, of Sims (B. M. 1922), is very nearly allied to this variety, as also is *P. pallida.*

P. v. iberica (Iberian). A variety with lilac flowers. 1885.

P. v. major (larger). A garden synonym of *P. Peyritschii.*

P. v. Nelsoni (Nelson's). *fl.* pale purple or pink, many on a scape. April and May. *l.* obovate, entire or slightly serrated; margins glandular-hairy. Habit of *P. viscosa*; rosettes neat. Originated in English gardens.

P. v. purpurea (purple).* A beautiful spring-flowering variety, bearing clusters of crimson-purple flowers.

P. Wulfeniana (Wulfen's).* *fl.* deep purple-violet, large. April and May. *l.* not punctate as in *P. spectabilis*, lanceolate-spathulate, shiny green; margins rough, cartilaginous. Alps. A good and very free rockery plant, requiring calcareous soil. In Vol. III., p. 222, it is placed as a variety of *P. spectabilis*, but it is quite entitled to specific distinction.

P. yunnanensis (Yunnan).* *fl.* violet-purple; corolla tube narrow, twice as long as the calyx; limb concave, bilobed, the lobes ovate, entire. July. *l.* ovate-oblong, crenulate, mucronate; petioles short, narrowly winged, glabrous. Clefts of limestone rocks at foot of Li-Kiang Glacier, China. A very fine species, closely allied to *P. uniflora.*

Varieties. The number of garden varieties in the various sections into which the genus is split up by florists is very great. For the convenience of the reader we give some of the best in each class:

Chinese Primulas (*P. sinensis*). BRAID'S SEEDLING, BRIDESMAID, BRIGHTNESS, EYNSFORD PINK, FERN-LEAVED DOUBLE BLUE, GIANT ROSY QUEEN, HER MAJESTY, IMPERIAL WHITE, KENTISH PURPLE, MISS EVA FISH, MISS INEZ, PEACH BLOSSOM, PINK QUEEN, PRINCESS, PURITY, ROSY QUEEN, and SWANLEY MAUVE.

Primula—*continued.*

Japanese Primroses (*P. cortusoides*). ARTHUR, BEAUTY, BLUSHING BRIDE, BRILLIANT, BRUCE FINDLAY, CHARMER, DISTINCTION, GEM, GENERAL GORDON, MISS NELLIE BARNARD, MRS. RYDER, NOVELTY, PEARL, PURITY, PURPLE KING, QUEEN OF THE WHITES, RUBY QUEEN, VICTOR, and WARE'S WHITE.

Primroses (*P. acaulis*). ARTHUR DUMOULIN, BLUE GEM, CLOTH OF GOLD, COVENANTER, CROUSSII FLORE PLENO, DOUBLE CRIMSON, ELIZABETH BRODIA, EVELYN'S ARKWRIGHT, G. F. WILSON, HARBINGER, JACK IN THE GREEN, JAMES NIMMO, MARY ERSKINE, MISS MASSEY, MRS. WILSON, OAKWOOD BLUE, QUAKERESS, QUEEN OF WHITES, RED GAUNTLET, THE MIKADO.

PRIMULINA (a diminutive of *Primula*; in allusion to the resemblance). ORD. *Gesneraceæ*. A monotypic genus. The species is a small, hardy perennial Alpine, with the habit of a Primula, and exhaling a powerful Tobacco-like odour. It is allied to *Klugia* and *Rhynchostylis*, but has a salver-shaped corolla, with nearly equal lobes, and the disk is highly-developed as two large, cuneately-quadrate, fleshy bodies at the base of the ovary. The plant is very difficult to rear in this country.

P. sinensis (Chinese). A synonym of *P. Tabacum*.

P. Tabacum (Tobacco). Shekin (Rock Tobacco). *fl.* disposed in loose corymbs; corolla limb ¼in. to ⅜in. broad, unequally five-lobed, the lobes white, with very broad purple borders. July. *l.* all radical, crowded, rather fleshy, orbicular, 2in. to 5in. across, obtusely lobulate; cordate at base; petioles 1in. to 3in. long, broadly winged. China, 1887. (G. C. 1889, vi., f. 52.) SYN. *P. sinensis* (B. M. 7117).

PRINOS INTEGRIFOLIUS. A synonym of **Nemopanthes canadense** (which *see*).

PRIONOPHYLLUM. A synonym of **Encholirion** (which *see*).

PRITCHARDIA. To the species described on p. 224, Vol. III., the following should be added:

P. filamentosa (thread-like). A synonym of *Washingtonia filifera*.

P. grandis. This name is also applied to *Licuala Veitchii*.

P. macrocarpa is synonymous with *P. Gaudichaudii*.

P. Thurstoni (Thurston's).* *fl.* borne in compact panicles at the apices of the slender stems; stems longer than the leaves, from the axils of which they rise. *l.* fan-shaped, palmatisect, large, forming a dense tuft at the top of the tall stem. Fiji, 1883. (R. G. 1887, p. 486-9, f. 123-4, 1-8.) A fine Palm.

PRIVET HAWK MOTH. *See* **Sphingidæ**, Vol. III.

PROCHYNANTHES (from *prochon*, an ewer, and *anthos*, a flower; in allusion to the shape of the perianth). ORD. *Amaryllideæ*. A small genus (two species have been described) of greenhouse, tuberous-rooted plants, natives of Mexico. Perianth sub-persistent, the tube sub-cylindrical at base, then abruptly geniculate and dilated, the segments broad, short, equal, erect; stamens inserted below the throat. Leaves linear-lanceolate or oblanceolate. Only one species is known to cultivation. It requires similar treatment to **Bravoa** (which *see*).

P. Bulliana (William Bull's). *fl.* brownish-green, quite sessile, in pairs, forming a very long, lax, simple spike; perianth tube abruptly decurved and dilated at the middle; peduncle erect, twice as long as the leaves, furnished with several reduced leaves. Summer. *l.* few, in a radical rosette, oblanceolate, acute, persistent, 1ft. or more in length, 2in. broad. 1883. (B. M. 7427.) SYN. *Bravoa Bulliana*.

PROPS. Strictly speaking, all supports of plants are "Props," but as usually understood, a Prop is a support for heavily-weighted branches that would otherwise break.

PROSOPIS. *P. juliflora* is the correct name of *P. Siliquastrum*.

PROSTRATE. Lying flat on the ground, but not rooting.

PROTEA. To the species described on p. 228, Vol. III., the following should be added. Several plants formerly included hereunder are now referred to **Aulax, Isopogon, Leucospermum,** and **Nivenia.**

P. amplexicaulis (stem-clasping). *fl.* purple, in a sub-sessile head the size of a small Apple; scales exceeding the flowers. February. *l.* sessile, cordate-amplexicaul, rigid, spreading, 1in. to 2½in. long, ovate or ovate-oblong, acute. Stem (or branches) 1ft. to 2ft. long, erect. 1802. SYN. *P. repens* (A. B. R. 453).

P. cynaroides (Cynara-like). *fl.* white, greenish below, in a large, obovate-globose, at length spreading head; scales pink at

Protea—*continued.*

apex. August. *l.* roundish-obovate or elliptic, 4in. to 6in. long (including the petiole). Stem dwarf, undivided. 1774. (G. C. 1895, p. 34, f. 3.)

P. humiflora (dwarf-flowered). A synonym of *P. humilis*.

P. humilis (dwarf). *fl.* purple, in a hemispherical head 1in. in diameter. *l.* linear, acute, flat, glabrous, 1in. to nearly 3in. long, very narrow. Plant erect. SYN. *P. humiflora* (A. B. R. 532).

P. imbricata (imbricated), of Thunberg. A synonym of *Sorocephalus imbricatus*.

P. magnifica is now regarded as distinct from *P. speciosa*.

P. Mundi is the correct name of *P. penicillata*.

P. nana (dwarf). *fl.* crimson, nodding, cup-shaped, 2½in. across, terminal; scales in three or four series. *l.* like those of a Pinus, crowded, erecto-patent, acicular, acute or acuminate. *h.* 2ft. 1889. A glabrous shrub. (B. M. 7095.)

P. patens (spreading). *fl.* blackish-purple at the summit; calyx white-woolly, 1½in. long; head sessile, as large a small fist, the inner scales dark purple-bearded. *l.* narrow-oblong, 4in. to 5in. long, slightly undulated. Branches woolly-tomentose, procumbent. SYN. *P. speciosa patens* (A. B. R. 543).

P. repens (creeping), of Andrews. A synonym of *P. amplexicaulis*.

P. rhodantha (rose-flowered). *fl.* rose-coloured, with orange stamens, disposed in a terminal head 3in. across, broadly turbinate; peduncle short. May. *l.* sessile, linear-oblong, rounded at apex. Stem short, swollen. *h.* 1½ft. 1886. (B. M. 7331.)

P. speciosa patens (spreading). A synonym of *P. patens*.

PROTEA (of Linnæus). A synonym of **Leucadendron** (which *see*).

PROTECTION. Tender plants that are not able to withstand the rigour of our winters need some kind of Protection, which is afforded in various ways. Dwarf Tea Roses are covered a few inches above the ground with a mound of Cocoa-nut fibre or similar material, so that if the winter kills all the exposed wood, that protected is safe. Standard and half-standard Tea Roses are greatly protected by Bracken Fern tied in the head. Mats are also largely used for the Protection of tender plants, and for covering frames, &c., in bad weather. In the early spring the blossoms of Peach, Nectarine, and Apricot trees on walls are protected until the flowers have all set by means of tiffany, cheap calico, netting, &c. Belts of hardy trees are also planted on the exposed side of fruit trees to break the force of cold winds; and the walls of gardens are erected as much for Protection as for the crops of fruit grown on them.

PROTIUM. Included under **Bursera** (which *see*).

PRUMNOPITYS (from *prumnos*, outermost; and *pituis*, a Pine-seed; in allusion to the fructification). SYN. *Stachycarpus*. ORD. *Coniferæ*. A small genus of greenhouse or hardy trees, formerly included under **Podocarpus** (which *see* for culture), but with the fruits on a loose spike instead of solitary on a fleshy stalk.

P. elegans (elegant). Plum Fir. The correct name of *Podocarpus andina*.

P. spicata (spicate). Black Pine; Matai; Mayi. *fl.*, male catkins sessile, ten to twenty in axillary spikes; females in loose spikes. *l.* mostly in two rows, ¼in. to 1¼in. long, needle-shaped or linear, imbricated. Branches and branchlets numerous, flexuous, ascending. *h.* (in New Zealand) 150ft. to 200ft. Greenhouse. *Dacrydium Mayi* is synonymous with this species.

PRUNELLA. To the species enumerated at p. 232, Vol. III., the following should now be added:

P. grandiflora alba (white). A snow-white variety, some 6in. high.

P. g. rubra (red). A variety with red flowers.

P. g. Webbiana (Webb's). A variety bearing rich purple flowers. *h.* 9in.

P. vulgaris laciniata (torn).* A handsome variety, with deep purple flowers.

PRUNUS. To the species and varieties described on pp. 235-7, Vol. III., the following should be added:

P. acida semperflorens (always flowering).* This is a splendid variety, of pendulous habit, with small white flowers, and small, dark, leathery leaves; bears flowers and fruit at the same time. It is frequently catalogued as *Cerasus semperflorens*.

P. alleghaniensis (Alleghany). *fl.* at first pure white, afterwards changing to pink. *fr.* bluish-purple, nearly globular,

Prunus—*continued.*

very handsome. *h.* 4ft. to 12ft. Pennsylvania, 1890. A shrub or small tree, allied to *P. insititia*. The fruits are used for preserves. (G. & F. 1890, p. 429, f. 53.)

P. Amygdalus. *See* **Amygdalus communis.**

P. angustifolia (narrow-leaved). A synonym of *Cerasus Chicasa.*

P. Armeniaca. *See* **Armeniaca vulgaris.**

P. baldschuanica (Baldschuan). *fl.* red; calyx tube ovate-cylindric. *l.* obovate-elliptic, coarsely and doubly serrated. Otherwise closely resembling *P. divaricata*. Baldschuan, Bokhara, 1890. Shrub or dwarf tree. (R. G. 1890, t. 613.)

P. candicans (whitish). A synonym of *Cerasus Chicasa.*

P. Capuli (Capollin). The correct name of *Cerasus Capollin.*

P. cerasifera is a form of *P. divaricata.*

P. Cerasus. *See* **Cerasus Caproniana.**

P. Chamæcerasus. *See* **Cerasus Chamæcerasus.**

P. Chicasa (Chicasaw Plum). *See* **Cerasus Chicasa.**

P. Cocomilia (Cocomilia). Febrifuge Plum. *fl.* white, borne on short, twin peduncles. *fr.* yellow, ovate-oblong, mucronate, somewhat acid. *l.* obovate, crenulate, glabrous, glandular. *h.* 20ft. Calabria, 1824.

P. communis (common). The name adopted by some botanists to include *P. domestica*, *P. insititia*, and *P. spinosa*, which are regarded by them merely as sub-species.

P. c. Pruneauliana (Pruneaul's).* *fl.* white, produced in such abundance as to quite cover the twigs. Of this fine variety there is a double form.

P. curdica. This is described as "intermediate between *P. spinosa* and *P. insititia*." Asia Minor, 1896.

P. Davidiana alba (white). This is a white variety of the species described in Vol. III. as *Persica Davidiana.*

P. divaricata atropurpurea (dark purple). The correct name of *P. Pissardii.*

P. d. contorta (twisted). This variety has the leaves spirally twisted, and is of more fastigiate habit than the type. 1895. SYN. *P. cerasifera contorta* (R. H. 1895, p. 201, f. 57).

P. domestica damascena (Damascene). Damson. *fr.* dark violet, small, oblong or slightly elongated, edible.

P. d. Plantierii (Plantier's). *fl.* pure white, semi-double, produced in abundance, and succeeded by black Plums of good flavour. 1885. Garden variety.

P. fruticans (shrubby). A form of *P. spinosa.*

P. glandulosa (glandular). A synonym of *P. japonica.*

P. humilis (dwarf). *fl.* ½in. across, solitary or in pairs on a short peduncle; petals white, with a short, red claw. *fr.* ½in. long, bright red, ovoid-globose. *l.* 1½in. to 2in. long, shortly petiolate, elliptic-ovate, serrulate. Branches slender, erect. *h.* 4ft. North China, before 1873. (B. M. 7335.) SYN. *P. japonica*, of Carrière (R. H. 1873, p. 457, f. 41). A rare species.

P. hybrida reptans (hybrid, creeping). *fl.* red. Branches prostrate, divaricate. 1886. Garden hybrid. (R. H. 1886, pp. 416-7.)

P. h. stricta (erect). *fl.* white. Branches erect. 1886. Garden hybrid. (R. G. 1886, pp. 416-7.)

P. Jacquemontii (Jacquemont's). *fl.* often in pairs, very shortly pedicellate; calyx tube ⅛in. to ¼in. long; petals pink, ¼in. broad, orbicular; stamens about twenty. May. *l.* 2in. to 2½in. long, ovate, ovate-lanceolate, elliptic, or nearly obovate, acute or acuminate, serrulate; petioles ¼in. long. *h.* 6ft. to 10ft. North-west Himalayas, 1886. Hardy shrub. (B. M. 6976.) A rare species.

P. japonica (Japanese). The correct name of *P. sinensis.* SYN. *P. glandulosa.*

P. j. sphærica (spherical). This form only differs from the type in its somewhat larger, spherical fruits. (R. H. 1887, p. 468, f. 136.) There is a garden seedling of this variety called *præcox*. (R. H. 1892, p. 488, f. 142-3.)

P. japonica (of Thunberg). A synonym of *P. humilis.*

P. juliana. St. Julian Plum. *fr.* dark violet, small. There is a pendulous form of this, introduced in 1889.

P. maritima pygmæa (pigmy). *fr.* red or purplish, smaller than in the type. *l.* softly pubescent or tomentose beneath. *h.* 4ft. to 5ft. North America, 1756.

P. Miqueliana (Miquel's). *fl.* pale pink or white, corymbose on short, leafy shoots; pedicels and calyx sparsely hairy. *l.* deeply and irregularly cut, having two orange glands at the base, and, as well as the petioles and young shoots, pubescent. Otherwise like *P. subhirtella*. Japan, 1888. (G. & F. 1888, pp. 196, 199, f. 37.)

P. Mume Alphandi (Alphand's). A variety having semi-double, rose-pink flowers. Japan, 1885. (R. H. 1885, p. 564.) SYN. *Armeniaca Mume Alphandi.*

Prunus—*continued.*

P. Myrobalana (Myrobalan). A synonym of *P. (divaricata) cerasifera.*

P. orthosepala (straight-sepaled). *fl.* white, with exserted, orange-coloured stamens. *fr.* globose, about 1in. in diameter, on a stout, rigid stalk about ½in. long; skin very dark blue or nearly black, with glaucous bloom; flesh of good flavour and quality, juicy, yellow. *h.* 4ft. to 5ft. Texas, 1894. A densely-branched, twiggy shrub. (G. & F. 1894, p. 184, f. 34.)

P. Padus. *See* **Cerasus Padus.**

P. pendula (pendulous).* *fl.* of a soft rose, freely produced. March and April. Japan. Of pendulous habit. It is closely allied to *P. subhirtella*. SYN. *Cerasus pendula rosea*, under which name it is generally found in commerce.

P. Pissardii is a variety (*atropurpurea*) of *P. divaricata.*

P. prostrata (prostrate). The correct name of *Amygdalus incana.* A nice shrub for a sunny rockery.

P. Pseudo-Cerasus. Of this there are several varieties with double flowers, the best of which are JAMES H. VEITCH, *fl. pl. luteo* (with yellow foliage), and *Watereri*. This is usually catalogued as a Cerasus.

P. Puddum (Puddum).* *fl.* rose-red or white, solitary, fascicled or umbellate; petals obovate or linear-oblong; peduncles ½in. to 1in. long. *fr.* oblong or ellipsoid, with red or yellowish, acid flesh. *l.* 3in. to 5in. long, ovate- or oblong-lanceolate, caudate-acuminate, sharply and often doubly serrated. Temperate Himalayas. A large tree, of brilliant appearance when in flower. SYN. *Cerasus Puddum.*

P. pygmæa (pigmy). A form of *P. maritima.*

P. serotina (late). The correct name of *P. salicifolia.* The fruits of this species are known as Capollins, Capoulinos, or Capulinos.

P. sibirica. *See* **Armeniaca sibirica.**

P. spinosa fruticans (shrubby). *fl.* arising before the leaves, solitary or twin. *fr.* reddish-yellow, pubescent-velvety, globular, sweet. *l.* ovate-sub-orbicular, slightly cordate at base and doubly toothed. France, &c. This variety is also known as *macrocarpa.*

P. subcordata (somewhat cordate). *fl.* resembling those of the ordinary Plum. *l.* roundish, finely serrated, slightly cordate at base. California, 1889. Shrub.

P. tomentosa (downy). *fl.* white, sub-sessile, solitary, or in fascicles of two to four. *l.* broadly elliptic, shortly cuspidate, with small serratures, the under-surface, as well as the new shoots, tomentose. Japan. (R. G., t. 853.)

P. virginiana. *See* **Cerasus virginiana.**

P. Watsoni (Watson's). *fr.* ⅜in. in diameter; skin thick, bright orange-red, without bloom; flesh juicy, bright yellow, edible and sometimes of good quality although slightly austere. Kansas, &c., 1894. A twiggy, dwarf Plum. (G. & F. 1894, p. 134, f. 25.)

PSAMMISIA. According to the compilers of the "Index Kewensis," *P. sclerophylla* is a distinct species, and not the same as *P. sarcantha.*

PSEUDO. False or spurious; *e.g.*, the Pseudo-bulb in Orchids.

PSEUDO-BOMBYCES. *See* **Moths.**

PSEUDO-CHÆNOMELES MAULEI. A synonym of **Pyrus Maulei** (which *see*).

PSEUDOCOCCUS ULICIS. *See* **Mealy Bug.**

PSEUDOGALTONIA (from *pseudos*, false, and *Galtonia*; in allusion to the resemblance). ORD. *Liliaceæ.* A monotypic genus. The species is a greenhouse, bulbous plant. For culture, *see* **Galtonia.**

P. Pechuellii (Pechuelli's). *fl.* greenish, 1½in. long, with obtuse segments, united in their lower two-thirds, and short stamens; raceme dense, sixty- to eighty-flowered; peduncle stiffly erect, overtopping the leaves. *l.* six to eight, fleshy, erect, lanceolate, above 1ft. long. Damara Land, 1886. Bulb large, crowned with bristles. SYN. *Lindnera fibrillosa.*

PSEUDOMONAS CAMPESTRIS. *See* **Black Rot of Cabbage.**

PSEUDOPHŒNIX (from *pseudo*, false, and *Phœnix*, alluding to the resemblance in general aspect to the kindred genus *Phœnix*). ORD. *Palmæ.* A monotypic genus. The species is a stove Palm, requiring similar culture to **Phœnix** (which *see*).

P. Sargentii (Sargent's). *fl.*, spadix panicled, about 3ft. long and broad. *fr.* bright orange or red, ⅜in. in diameter. *l.* pinnate, 4½ft. long; leaflets lanceolate, acuminate, 1ft. to 1½ft. long, glaucous beneath. *h.* 25ft. Florida, 1887. (G. C. 1888, iv., p. 409; G. & F., i., 1888, pp. 353, 355.)

PSEUDOTSUGA. To the species and varieties described on p. 238, Vol. III., the following should be added:

P. Davidiana (Abbé David's). A synonym of *Keteleeria Davidiana.*

P. Douglasii brevifolia (short-leaved).* *l.* green, polished. This somewhat resembles the Silver Firs; it is of pyramidal habit and slow growth.

P. D. glauca pendula (glaucous, pendulous).* *l.* dark green. Young growth glaucous-tinted. 1895. A tall variety.

P. D. glaucescens (glaucous). A very glaucous form. 1895. Other forms are: *denudata* (stem very simple), *dumosa* (dwarf, compact bush), *fastigiata* (pyramidal), and *stricta* (dwarf, erect-branched).

P. D. pumila (dwarf).* A distinct variety, of neat, compact habit.

P. D. Stairii (Earl Stairs').* *l.* nearly white in spring, gradually changing to pale green. A showy, free-growing form, less vigorous than the type.

PSIDIUM. To the species described on p. 239, Vol. III., the following should be added:

P. aromaticum is a form of *P. Guajava.*

P. Guajava is the correct rendering of *P. Guava.*

P. montanum (mountain-loving). The correct name of *P. cordatum.*

P. Passeanum (Passe's). *fl.* white, axillary. *fr.* pale green or yellowish, pear-shaped, about as large as a Plum, edible. *l.* opposite, ovate-lanceolate, acuminate, borne on short petioles. Stems slender, round. *h.* 3ft. to 6ft. Habitat not recorded, 1890. Shrub. (R. H. 1890, p. 233, f. 71.)

PSILA ROSÆ. *See* **Carrot Grubs.**

PSILOTUM. *P. mascarenica* and *P. nudum* are practically identical with *P. triquetrum.*

PSILURA DISPAR. *See* **Black Arches Moth.**

PSITTACOSCHŒNUS. A synonym of **Gahnia** (which *see*).

PSORALEA. *P. arborea* is now regarded as merely a form of *P. pinnata.*

PSYCHECHILUS. A synonym of **Zeuxina** (which *see*).

PSYCHOTRIA. To the species described on p. 239, Vol. III., the following should be added. Several plants formerly classed hereunder are now referred to **Palicourea.**

P. cyanocarpa (blue-fruited). The correct name of *P. cyanococca.*

P. leucocephala (white-headed). A synonym of *Rudgea macrophylla.*

P. pilosa (pilose). The correct name of *P. chontalensis.*

P. racemosa (racemose). The correct name of *Palicourea racemosa.*

P. sulphurea (sulphur-coloured).* *fl.* bright blue, Centranthus-like, borne in clusters. *fr.* sulphur-yellow. *l.* shining green. Fiji, 1887. A profuse and continuous flowering, small, climbing shrub.

P. tabacifolia (Tobacco-leaved). *fl.* ⅜in. long, shortly pedicellate; calyx pubescent, the lobes triangular; corolla pale yellow, tomentose, tubular, the lobes short, triangular, margined red; thyrse terminal or from one of the upper axils, 4in. to 7in. long, contracted. September. *l.* opposite, 5in. to 9in. long, 2in. to 3in. broad, elliptic-lanceolate or oblong, acuminate, rather membranous. Brazil. SYNS. *Palicourea discolor* (of gardens), *Palicourea nicotianæfolia* (B. M. 7001).

PSYLLA MALI. *See* **Apple-Sucker.**

PSYLLA PYRISUGA. *See* **Pear—Insects.**

PTERIDOPHYLLUM (from *Pteris*, a Fern, and *phyllon*, a leaf; the leaves are like Fern-fronds). ORD. *Papaveraceæ.* A small genus (two species) of herbs, with rather thick rhizomes, natives of Japan, and very closely allied to *Hypecoum.* Flowers in a simple or slightly-branched, terminal raceme: sepals two, scale-like; petals four, spreading, the outer ones elliptic-concave, the inner ones flat; scape naked. Leaves radical, pectinately pinnatisect. *P. zeylanicum* was introduced some thirty years ago, but it does not appear now to be in cultivation.

PTERIS. Pterises are not fastidious as regards soil: and a mixture of two parts peat, one part loam, and one part sand suits most of them. The majority of them thrive as well in a place exposed to strong light as in a shady one, but this does not apply to the beautifully-variegated *P. quadriaurita argyræa, P. cretica albo-lineata, P. asperi-caulis tricolor,* and *P. ensiformis Victoriæ,* all of which, either in their natural habitats or under cultivation, need a subdued light. The cause of these plants being frequently met with in a stunted condition and having a burnt appearance is generally attributable to the effects of strong light, and this is readily understood when we consider the natural conditions under which the plants flourish, being always found in the dense shade of forests where the annual rainfall is very heavy, and rarely if ever growing in Bamboo forests where the shade is partial only.

With the exception of a few species provided with creeping rhizomes, and which may be propagated by division, all Pterises are readily increased from spores, which are abundantly produced and germinate very freely.

The Bracken can rarely be grown successfully in pots for a long time; but it forms a noble ornament when planted in a deep, sandy soil, where the development of its fleshy rhizomes is not interfered with. In such a position it should be covered with old leaves every winter, or with its own if these are not required for other purposes. Its propagation takes place naturally by means of the spores, for it requires special care in transplanting, and can only be successfully moved when dormant in winter.

Although *P. e. Victoriæ* reproduces itself very freely from spores, some of the seedlings are thoroughly distinct. Among these we may particularly note *reginæ,* which has the variegation running in narrow stripes to the margins of the leaflets, and is of more vigorous growth than *Victoriæ*; and *cristata,* a form with very prettily and regularly crested fronds, which are also beautifully and distinctly variegated.

P. palmata possesses the peculiarity of reproducing itself from bulbils borne at the top of the stalk, just at the point of junction with the leafy portion. The quickest way of propagating it in quantities is by means of spores, which are freely produced; yet the bulbils will, if pegged down on the ground without being severed from the parent plant, make young plants in a very short time.

To the species and varieties described on pp. 240-5, Vol. III., the following should be added. Except where otherwise indicated, stove treatment is required.

P. adiantifolia (Adiantum-fronded). A synonym of *Pellæa adiantoides.*

P. adiantoides (Adiantum-like). A synonym of *Pellæa adiantoides.*

P. Bausei (Bause's). A variety of *P. semipinnata.*

P. biaurita argentea (silvery).* *fronds* deep shining green, with the bases of the pinnules greyish or whitish-green. 1894. A useful plant.

P. Boultoni (Boulton's). A form of *P. serrulata* showing a very distinct colour, this being a light pea-green.

P. Childsii (Childs'). *fronds* compound; pinnæ much sub-divided, "the tips and margins being percristate." Origin not stated. 1896. Greenhouse.

P. comans densa (dense). *fronds* spreading round an erect caudex. New Caledonia, 1880.

P. crassipes (thick-stalked). A synonym of *P. gigantea.*

P. cretica crispata (crisped). *fronds* beautifully crisped, bold, spreading, green, with a ½in. band of glaucous-grey down the centre. 1891.

P. c. Mayii (May's).* *fronds* variegated as in *P. c. albo-lineata,* but the plant is smaller, and all the pinnæ, whether barren or fertile, are crested. This form reproduces true from spores.

P. c. nobilis (noble).* *fronds* erect, beautifully crested. 1838. A dwarf variety.

P. c. sempervirens (evergreen).* A handsome crested variety, exceedingly useful for room decoration.

P. c. Summersi (Summers's). *fronds* much divided, having all the principal pinnæ heavily divided and crested at apex. 1898. This is described as "a particularly fine Pteris, of sturdy but elegant growth." (G. C. 1898, xxiii., p. 370, f. 139.)

P. c. Wimsetti (Wimsett's).* *fronds* from 1½ft. to 2ft. long, chestnut-striped; pinnæ variable.

P. Drinkwateri (Drinkwater's).* *fronds* 2ft. high; pinnæ dark green, ⅜in. wide. 1896. A beautiful Fern for the conservatory.

Pteris—*continued.*

P. Duvali (Duval's). A garden hybrid between *P. palmata* and *P. sagittifolia*. 1897. SYN. *Doryopteris Duvali* (R. H. 1897, p. 563, f. 168).

P. elegans (elegant). A garden name for *P. nobilis*.

P. ensiformis Victoriæ (Victoria's). *barren fronds* small, prostrate. *fertile fronds* upright, abundant, 1¼ft. to 1½ft. long; pinnæ about ¼in. broad, beautifully variegated throughout. SYN. *P. e. variegata*. There are two other forms—*cristata*, with beautifully variegated and crested fronds; and *reginæ*, having the variegation in narrower stripes than in *Victoriæ* and more vigorous in growth.

P. flabellata ascensionis (Ascension Island). A variety of smaller dimensions than the type, its lower leaflets sometimes showing several small, compound leaflets on each side. 1865.

P. gigantea (gigantic). *sti.* stout, erect, naked, 2ft. to 3ft. long. *fronds* coriaceous, tripartite; terminal pinna 1ft. long, 3in. broad, cut down to a broadly-winged rachis into numerous narrow, falcate lobes, which are slightly toothed when barren; lateral ones numerous, often 1½ft. long and 4in. broad; pinnules nearly 2in. long. *sori* falling short of the tips of the segments. West Indies, &c. SYNS. *P. crassipes*, *Litobrochia gigantea*.

P. glaucovirens (glaucous-green). A synonym of *P. quadriaurita*.

FIG. 641. FROND OF PTERIS GRIFFITHII.

P. Griffithii (Griffith's). *sti.* erect, wiry, 6in. to 8in. long. *fronds* somewhat coriaceous, broadly lanceolate, 6in. to 8in. long; upper lateral pinnæ simple, about ¼in. apart; lower ones 2in. to 3in. apart, divided to the midrib, their lowest pinnules often again divided. *sori* covered by a narrow involucre. Northern India. See Fig. 641. (H. S. F. ii., p. 170, t. 123A.)

P. internata (grown between). *fronds*, outer ones ovate, tripinnate; central ones longer, bipinnate. West Indies, 1830. Resembles *P. heterophylla*, of which it is perhaps a variety.

P. latifolia (broad-fronded). A synonym of *Pellæa adiantoides*.

P. longifolia Maricsii (Maries').* This differs from the type in having shorter fronds and narrower pinnæ. Penang, 1895. It reproduces itself true from spores.

P. l. nobilis (noble). *fronds* evergreen, 4ft. to 5ft. high; pinnæ linear, 8in. to 10in. long; rachis pale brown. *sori* continuous, linear, marginal. South Sea Islands, 1884.

P. ludens (sportive).* *rhiz.* wide-creeping. *fronds* dimorphous; barren ones on slender, black stipes 3in. to 4in. long, varying from triangular with two slightly-deflexed basal lobes to hastate, with entire margins; fertile ones on stipes often 1ft. long, 4in. to 6in. each way, cut into five narrow-lanceolate lobes, all or some of which (except the terminal one) are sometimes again forked. *sori* in a continuous line round the margin. Malaya and the Philippine Islands. See Fig. 642. SYN. *Doryopteris ludens*. A remarkable species.

P. nobilis (noble).* *sti.* naked, wiry, 1ft. or more in length. *fronds* very coriaceous; first-produced one cordate; later ones hastate and finally somewhat palmate, with the terminal and upper lateral pinnæ entire, the lower lateral ones divided into two or four lanceolate pinnules on their lower side, and all of them having a broad band of white in the centre. *sori* in a continuous line from base to apex. Southern Brazil. A very handsome species. SYNS. *P. elegans*, *Doryopteris nobilis*, *Litobrochia elegans*.

Pteris—*continued.*

P. n. Duvali (Duval's).* A variety with stout, palmate fronds. 1897.

P. n. variegata (variegated).* A handsome and robust form, well marked with silver. 1894.

P. nobilis (of gardens). A synonym of *P. palmata*.

P. Ouvrardi (Ouvrard's). A form intermediate between *P. cretica* and *P. umbrosa*. A beautiful Fern.

P. reginæ (Queen's). A garden form of *P. ensiformis*.

P. Rochfordi (Rochford's). A form of *P. serrulata*.

P. semipinnata Bausei (Bause's).* *sti.* deep chestnut-brown. *fronds* densely tufted, erect, 12in. to 13in. high; pinnæ about 2in. long, the lowermost bipinnate, consisting of four to six broadly linear, deep green pinnules. 1886. A useful, decorative, garden Fern, of very compact habit.

P. serrulata Boultoni (Boulton's). *fronds* long, with narrow, waved, crimped pinnæ. 1896. A stiff-growing variety.

P. s. Cowani (Cowan's). *sti.* branched. *fronds* broad-ended, with crested pinnæ. 1883.

P. s. cristata. This variety is very variable. The usual form is of upright habit, but many seedlings are more or less drooping. The varieties *compacta* and *densa* only differ from this in their close, dense habit and dwarf stature.

P. s. c. gigantea (gigantic). A very large form, probably of garden origin. 1893.

P. s. c. lacerata (torn). *fronds* 9in. to 12in. long, slender, the margins serrulate; each pinna divided into a tassel-like or corymbose, drooping bunch of lacerated segments. 1882. *nana* is a dwarf form.

P. s. gloriosa (glorious). *fronds* having each pinna many times divided at its summit, and each division terminating in a deeply-cut, fan-shaped crest. Habit pendulous.

P. s. gracilis (slender). *fronds* narrow, densely produced, of a pleasing green; pinnæ very narrow. 1892. A delicate and graceful variety. In the form *multiceps* the fronds are crested. 1894.

FIG. 642. PTERIS LUDENS.

P. s. Leyii (Ley's). A curious, depauperate form, with the pinnæ elongated by long, filiform extensions of their midribs. 1876.

P. s. pendula (pendulous). *fronds* so densely crested at the apex as to cause them to assume a pendulous position, the tassel of a paler green than the rest. 1891.

Pteris—*continued.*

P. s. plumosa (feathery).* A charming, tasselled form. 1889.

P. s. Pocockii (Pocock's). *fronds* drooping, having a short, dense crest at the end of each segment. 1884.

P. s. Rochfordi (Rochford's). A robust, crested form. 1898.

P. s. voluta (wreathed). *fronds* having the pinnæ decidedly curled, crested at apex. 1895.

P. Summersi (Summers's). A form of *P. cretica.*

P. tremula densa (dense). *fronds* so heavily crested as to almost resemble Parsley. 1892. A compact variety, smaller than the type.

P. t. elegans (elegant).* A very light and charming variety. 1896.

P. t. flaccida (flaccid). *fronds* bright and shining; pinnæ narrower than in the type; terminal pinnules much elongated and slightly twisted.

P. t. foliosa (leafy). *fronds* wavy, larger and broader than in the type. 1886.

P. t. grandiceps (large-crested). *fronds* semi-dependent, the apices divided into flattish, fimbriately-tasselled crests, made up of four or five principal divisions and numerous multifurcations; pinnæ and pinnules also terminating in narrow apices. 1887.

P. t. nivalis (snowy).* This variety is described as "a charming Fern, very graceful and silvery in colour, edged with green." 1892.

P. t. Smithiana (Smith's).* *fronds* 2ft. to 2½ft. high including the stalks, much divided and heavily crested, but variable. A very handsome variety.

P. t. variegata (variegated). *fronds* having a silvery band along the centre of the pinnæ and pinnules. 1892. A beautiful form.

P. umbrosa cristata (crested). *fronds* erect, with drooping pinnæ and pinnules; all the segments long-linear, much divided and crisped at the tips, deep green. 1879.

P. undulata (undulated). *sti.* dark chestnut-brown, 1½ft. long. *fronds* 2ft. long and broad, triangular or sub-pentangular, pinnate; pinnæ broadly lanceolate, pinnatifid throughout; segments 2in. to 2½in. long, the basal one decurrent, the rest connected by a ¼in. wing. *sori* not extending to the apex or sinus of the lobes. Fiji. SYN. *Litobrochia undulata.* This is now regarded as distinct from *P. comans.*

P. Victoriæ (Victoria's). A variety of *P. ensiformis.*

P. Wallichiana (Wallich's). *sti.* strong, chestnut-brown, glossy, 5ft. to 6ft. long. *fronds* large, thrice divided; central pinna 2ft. long, 1ft. broad, its many lanceolate, sessile pinnules cut nearly to the rachis into numerous oblong lobes nearly entire when barren; lateral pinnæ as large as the central one and again forked; all of a soft texture and pale green. *sori* disposed along the whole length of the pinnules. Japan, &c. Greenhouse. SYN. *Campteria Wallichiana.*

P. Wimsetti (Wimsett's). A variety of *P. cretica.*

PTERISANTHES (from *pteron*, a wing, and *anthos*, a flower; the flowers are borne on a broadly-winged axis). SYN. *Embamma.* ORD. *Ampelideæ.* A small genus (four species) of large, climbing or sarmentose, stove plants furnished with tendrils, closely allied to *Vitis*, natives of the Indian Archipelago. Flowers small, four- or five-parted, inserted on a flat, expanded, membranous, pedunculate rachis, unisexual. Fruit globose or ovoid, one- to four-seeded. Leaves alternate, simple or three- to seven-foliolate, digitate or pedate. For culture of *P. polita*, the only species introduced, *see* **Cissus.**

P. polita (elegant). *fl.* borne on a flattened rachis, the marginal ones stalked, the rest sessile. *l.* 4in. to 8in. long, elliptic-oblong or ovate, acute, sub-cordate, distantly and spinosely serrated or entire, membranous. Moulmein, &c., 1896. Habit like a Cissus. (B. M. 7561.)

PTEROCALLIS TILIÆ (Lime Aphis). *See* **Aphides.**

PTEROCARYA. *P. caucasica* is the correct name of *P. fraxinifolia.* *P. Spachiana* is a form of this species.

PTEROPHORINA. *See* **Moths.**

PTEROSTIGMA. A synonym of **Adenosma** (which *see*).

PTILOSTEPHIUM. Included under **Tridax** (which *see*).

PTYCHOCHILUS. A synonym of **Tropidia** (which *see*).

PTYCHOCOCCUS (from *ptyche*, a fold, and *kokkos*, a berry; in allusion to the wrinkled albumen). ORD. *Palmæ.* A genus of three species of Javan Palms, founded by Beccari, formerly included under *Ptychosperma.* It differs from that genus in the form of the fruit, which in *Ptychococcus* is obliquely attenuated into a beak at the apex, instead of being rounded. For culture, *see* **Ptychosperma.**

Ptychococcus—*continued.*

P. arecinus (Areca-like).* A very beautiful, pinnate-leaved Palm, which, in its native forests, attains a height of 60ft. or more.

P. paradoxus (paradoxical). *l.* sheathing at base; young ones two-lobed, the lobes oblong-cuneate, oblique at apex, with jagged margins; adult ones deeply pinnately-cleft, with lanceolate pinnæ 10in. to 12in. long, oblique at apex and jagged; petioles grooved. Stem erect, slender, 15ft. to 20ft. high. New Guinea, 1894. SYN. *Ptychosperma paradoxa* (of gardens).

PTYCHORAPHIS (from *ptyche*, a fold, and *raphis*, a needle; probably in allusion to the leaflets). ORD. *Palmæ.* A small genus (two species) of stove Palms, natives of Singapore, Johore, and the Nicobar Islands, closely allied to *Nenga.* Flowers spirally disposed, male only towards the tips of the branches, a female between two males towards the base; spathes two, complete, caducous; spadix intrafoliolar, paniculately branched. Fruit small, ovoid. Leaves pinnatisect; leaflets narrow, caudate-acuminate. For culture, *see* **Palms.**

P. augusta (splendid).* *fl.*, spadix decompound, 2½ft. to 3½ft. long. *fr.* scarlet, 1in. long, elliptic-oblong. *l.* 8ft. to 12ft. long; leaflets numerous, sessile, narrow-linear, 2ft. to 3ft. long, acuminate, three-ribbed; petioles very short. Trunk 80ft. to 100ft. high, 1ft. in diameter. Nicobar Islands, 1892. When young, this resembles *Cocos Weddeliana.* An elegant Palm in a young state. (G. C. 1892, xii., p. 397, f. 63.)

P. singaporensis (Singapore). *fl.* yellow; spadix about 1ft. long, branched from the base. *fr.* ⅜in. long, ovoid or elliptic-ovoid. *l.* 3ft. to 6ft. long; leaflets numerous, alternate, straight, 8in. long, 1½in. broad; petioles 2ft. to 2½ft. long. Stem 6ft. to 12ft. long, 1½in. in diameter, soboliferous. Singapore and Johore, 1884. SYNS. *Drymophlœus, Ptychosperma,* and *Rhopaloblaste singaporensis.*

PTYCHOSPERMA. To the species described on pp. 247-8, the following should be added:

P. angustifolia (narrow-leaved). A synonym of *Coleospadix oninensis.*

P. disticha (two-rowed). A synonym of *Pinanga disticha.*

P. elegans (elegant).* *fl.*, panicles lateral, 1ft. to 1½ft. long and broad, branching into numerous spikes, the ends very flexuous. *l.* several feet long; segments numerous, more or less toothed or irregularly jagged at the end. Australia. A low or very tall Palm. (B. M. 7345.) SYN. *Seaforthia elegans* (of R. Brown).

P. elegans (of gardens).* A synonym of *Archontophœnix Cunninghamiana.*

P. Normanbyi is now classed under *Areca.*

P. paradoxa (paradoxical). A garden synonym of *Ptychococcus paradoxus.*

P. Sanderiana (Sander's).* *fl.*, males in pairs, on a much-branched panicle; females on a separate panicle. *fr.* bright red, ½in. long, ovoid. *l.* 4ft. long, pinnate; segments alternate, linear, 1½ft. long, tapering to a long point. Stem 10ft. to 15ft. high; nodes 3in. apart. New Guinea, 1898. Young specimens are very elegant. (G. C. 1898, xxiv., pp. 330, 435, f. 126.)

P. Seemanni is now classed under *Balaka.*

P. singaporensis (Singapore). A synonym of *Ptychoraphis singaporensis.*

P. Warleti (Warlet's). *l.* pinnate, having the sheaths and stalks covered with coarse, purplish hairs; segments oblong-cuneate, erose at the margin, silvery beneath. Habitat not recorded, 1898. Only known in a young state. (G. C. 1898, xxiii., p. 242, f. 91.)

PUCCINIA ARENARIÆ. *See* **Carnation Rust.**

PUCCINIA HIERACII. *See* **Chrysanthemum Leaf Rust.**

PUCCINIA MALVACEARUM. *See* **Hollyhock Fungus.**

PUCCINIA PRINGSHEIMIANA. *See* **Gooseberry Fungi** and **Gooseberry Cluster Cups.**

PUCCOON, RED. *See* **Sanguinaria.**

PUDDLING. *See* **Muddling.**

PUERARIA. According to the "Kew Bulletin," 1892, *Pachyrhizus Thunbergianus*, *Dolichos hirsutus*, and *D. japonicus* are synonyms of *Pueraria Thunbergiana*. (R. H. 1891, p. 31, f. 8.)

PUKATERIA. A synonym of **Griselinia** (which *see*).

PULMONARIA. To the species described on p. 251, Vol. III., the following should be added:

P. arvernense. This is a garden name for a beautiful kind having deep blue flowers in clusters. There is also a white variety.

P. azurea is a variety of *P. angustifolia*.

P. grandiflora is a synonym of *P. saccharata*.

P. mollis (soft). *fl.* as in *P. officinalis*. June. *l.* softly pubescent; radical ones elliptic-lanceolate or lanceolate, decurrent into broadly winged petioles; cauline ones ovate-lanceolate, semi-amplexicaul. *h.* 9in. Pyrenees.

PULP. The soft, juicy inner part of a fruit.

PULTENÆA. To the species described on pp. 251-2, Vol. III., the following should be added:

P. Gunni (Gunn's). *fl.* golden-yellow, with brownish-purple stripes on the standard and a brownish-purple keel, small; heads three- to five-flowered, terminating the branchlets. *l.* very small, linear-lanceolate. Branches twiggy. 1885. (R. G. 1173 [1174 in text].)

P. linophylla (Linum-leaved). The correct name of *P. retusa*.

P. sylvatica (sylvan). A synonym of *Oxylobium ellipticum* (*Pultenææ*).

P. Ausfeldi has also been introduced.

PULVINARIA. A genus of very distinct Scales, so named on account of the cushion or pad of white wax which the female secretes at the hinder extremity of and beneath her body. The species of interest to the gardener are *P. ribesiæ*, found on Currants (*see* **Currant Scale**); *P. vitis*, on Vines; and *P. floccosa*, on Camellias. For remedies, *see* **Scale Insects.**

PUPALIA. *Syama* is synonymous with this genus.

PURPLE-FLOWERING RASPBERRY. *See* **Rubus odoratus.**

PURPLE LOOSESTRIFE. *See* **Lythrum Salicaria.**

PURPLE OSIER. *See* **Salix purpurea.**

PURSHIA. This genus now embraces a second species, in addition to that described on p. 253, Vol. III.

P. glandulosa (glandular). *fl.* yellowish-white, with a Cinnamon-like odour, small, numerous. North-west America, 1898. A dwarf shrub, resembling *P. tridentata*.

PUYA. J. G. Baker refers fourteen species to this genus. Several plants formerly included here are now classed under **Pitcairnia.** To the two species described on p. 255, Vol. III., the following should be added:

P. chilensis (Chilian). *fl.* greenish-yellow; petals twice as long as the calyx; panicle dense, rhomboid, 2ft. to 3ft. long, with crowded branches; lower bracts 1in. long; peduncle erect, much longer than the leaves. July. *l.* 100 or more in a rosette, ensiform, acuminate, 3ft. to 4ft. long, 1½in. broad, vertically lined on the back, armed with large, distant, horny spines. Caudex 6ft. to 10ft. long. Chili, &c., 1820. (B. M. 4715; F. d. S. 869-70; R. G. 225.) SYN. *P. coarctata*.

P. c. gigantea (gigantic). *l.* erect, with shorter and more robust prickles. Caudex 10ft. to 15ft. long.

P. coarctata (coarctate). A synonym of *P. chilensis*.

P. cœrulea. The correct name is *Pitcairnia cærulea*.

P. lanuginosa (woolly). *fl.* greenish-blue, borne in a dense, simple spike 1ft. long by 3in. in diameter, surmounting a stout peduncle 3ft. long; flower bracts lanceolate, acuminate, very woolly, whitish-brown on the back; sepals obtuse, much imbricated; petals oblong-obovate, the blade ¾in. broad. October. *l.* sixty to 100 in a dense rosette, ensiform, 2ft. to 2½ft. long, 1in. broad low down, tapering to a long point, green above, white below, beset with distant, ascending spines. Trunk 2ft. to 3ft. high, forked at the top, hidden by old, dead, reflexed leaves. This plant flowered for the first time at Kew in 1888.

P. Roezli (Roezl's). A synonym of *Pitcairnia megastachya*.

P. Thomasiana (Thomas's). A tall-growing species with bluish-green flowers. South-west Colombia, 1899. (B. H. 1899, p. 452.)

P. virescens is a synonym of *Caraguata virescens*.

P. Whytei (Whyte's). A synonym of *Pitcairnia cærulea*.

PYCNANTHEMUM (from *pyknos*, dense, and *anthemon*, a blossom; in allusion to the dense inflorescence). Mountain Mint. SYNS. *Brachystemum*, *Koellia*, *Tullia*. ORD. *Compositæ*. A genus embracing about seventeen species of mostly hardy, erect perennials, with a pungent, Mint-like flavour, confined to North America, and allied to *Origanum*. Flowers whitish or purplish, the lips of the corolla mostly dotted with purple; whorls many-flowered, dense, crowded with bracts, usually forming terminal heads or close cymes. Stems often corymbosely branched above. Only two species have been introduced. For culture, *see* **Perennials.**

P. lanceolatum (lanceolate). *fl.* in small, numerous, capitate clusters, villous-canescent; bracts ovate. Summer. *l.* lanceolate or almost linear, nearly sessile, entire, very numerous, obtuse at base. Stem somewhat pubescent.

P. muticum (curtailed). *fl.* white, in very dense clusters at the ends of the branches and in the uppermost axils. Summer and autumn. *l.* ovate, broadly ovate-lanceolate or lanceolate, rather rigid, acute, mostly sessile and minutely toothed. *h.* 1ft. to 2½ft. 1897. Plant minutely hoary, pleasantly aromatic. SYN. *P. pilosum*.

P. pilosum (pilose). A synonym of *P. muticum*.

PYRALIDINA. *See* **Moths.**

PYRETHRUM. To the species and varieties described on p. 257, Vol. III., the following should be added:

P. Decaisneanum (Decaisne's). *fl.-heads* pale yellow, radiate, larger than those of *C. marginatum*. Autumn. *l.* obovate, pinnatifid. *h.* 1ft. to 1½ft. Japan, 1887. SYN. *Chrysanthemum Decaisneanum*.

P. diversifolium (variable-leaved). A synonym of *Brachycome diversifolia*.

P. marginatum (margined). *fl.-heads* deep yellow, small, disposed in rounded corymbs. Autumn. *l.* cuneate-oblong, pinnatifid in the upper third, tomentose beneath and on the edge. Stems tomentose. Japan, 1837. SYN. *Chrysanthemum marginatum*.

P. Mawii (Maw's). *fl.-heads* 1in. to 1¼in. across, on rather long peduncles; rays about twenty, white, rose-coloured at back, broadly linear-oblong, three-toothed. August. *l.* scattered, about 1in. long, triangular to oblong, pinnatifid. Branches 1ft. to 1½ft. high. Rootstock woody. Greater Atlas, 1871. (B. M. 5997.)

P. multifidum (much-cleft). *fl.-heads* white, long-pedicellate, resembling Marguerites; corymb large, very many-flowered. Summer. *l.* petiolate, pinnatifid, finely cut. *h.* 1½ft. to 2ft. Orient. A branched, tufted, whitish-pubescent, hardy perennial. (R. H. 1896, p. 449, f. 152-3.)

P. parthenifolium aureum selaginoides (Selaginella-like). *l.* flat, shallowly lobed, so cut as to resemble a sprig of Selaginella, of a bright yellowish-green. 1832.

P. p. glaucum (glaucous). This variety differs from the type in having glaucous leaves. 1895.

P. Starckianum (Starck's). *fl.-heads* white, large. *l.* deeply cut. *h.* 1ft. Caucasus, 1897. A greyish-tomentose alpine.

Varieties. The beautiful varieties, both single and double, which florists have of recent years evolved, are superior to the species. They are amongst the finest of hardy perennials, and will flower a second time if cut down, say after the first display is over in June. They like a well-trenched, loamy soil, and plenty of water during dry seasons. A selection of the two sections is given below:

Single Pyrethrums. AGNES MARY KELWAY, APOLLYON, ASCOT, BEATRICE KELWAY, CASSIOPE, CLEMENCE, COMET, DECOY, FIREFLY, GENERAL FRENCH, JAMES KELWAY, KLEINHOLTZ, MARY ANDERSON, MERRY HAMPTON, MR. SANTLEY, OLIVER TWIST, PETER BARR, PRINCESS CHARLOTTE, PRINCESS MARIE, PRINCESS OF WALES, QUEEN OF THE MARKET, ROSETTA, YELLOWSTONE.

Double Pyrethrums. ALFRED, ALFRED HENDERSON, ANEMONÆFLORA, APHRODITE, CARL VOGT, EMPRESS QUEEN, FIGARO, FLORENTINE, KING OSCAR, LADY KILDARE, LEONARD KELWAY, LORD ROSEBERY, MAGICIAN, METEOR, MILTON, ORMONDE, PERICLES, PRIMROSE, QUEEN SOPHIA, SHOTOVER, SOLFATERRE, WILSON BARRETT.

PYROLA. *P. uniflora* is a synonym of *Moneses grandiflora*.

PYROSTRIA. A synonym of **Timonius** (which *see*).

PYRULARIA. *P. pubera* is the correct name of *P. oleifera*.

PYRUS. Including *Micromeles.* To the species and varieties described on pp. 258-62, Vol. III., the following should be added:

P. Achras (Achras). A form of *P. communis.*

P. alnifolia (Alder-leaved). *fl.* in a long-pedunculate corymb. *fr.* ovate, ½in. long. *l.* 2in. to 3in. long, ovate, acuminate, rounded at base, doubly serrated, glabrous, coriaceous, pale beneath; petioles rather thick, channelled, tomentose. Branches erecto-patent; branchlets short. Japan, 1892. (R. G. June, 1892, pp. 282-4, f. 61-2.) SYNS. *Micromeles alnifolia, Sorbus alnifolius.*

P. amygdaliformis (Almond-like). *fl.* white, corymbose; petals obovate, hairy to the claw. May and June. *fr.* globose, usually crowned by the calyx. *l.* oblong or linear-elliptic, obtuse, cuneate at base, often obsoletely crenulate, floccose-pubescent beneath when young. Branches spiny; buds pubescent. *h.* 15ft. South Europe, 1810. This is sometimes classed as a variety of *P. nivalis.* It is also known as *P. parviflora.*

P. Aria chrysophylla (yellow-leaved). A garden form with yellow leaves. 1891.

P. A. discolor (discoloured). A small tree. 1891.

P. A. intermedia (intermediate). A synonym of *P. A. scandica.*

P. Aucuparia. Rantry; Rhoddon, Roan, or Roddon Tree. The following additional varieties may be noted:

P. A. atropurpurea (dark purple). *fl.* produced in large corymbs. *fr.* very dark red, very large. 1889.

P. A. foliis-aureis (golden-leaved).* *l.*, leaflets rather thick, tomentose, marked with yellow, which deepens with age. 1886. An ornamental, garden variety.

P. A. rossica fructudulci (Russian, sweet-fruited). A form of the Mountain Ash with sweet fruits. Russia, 1896.

P. Bollwylleriana. *P. auricularis* is the correct name.

P. cardinalis (cardinal-red).* *fl.* of a clear cardinal-red, thickly produced, very large and of good substance. 1893. A garden form.

P. Conwentzii (Conwentzi's). A hybrid of which *P. Aria* is one of the parents. Pomerania, 1899.

P. coronaria flore-pleno (double-flowered). This is a double-flowered form of the typical *P. coronaria*; but its introduction was announced in 1893 under the name of *P. angustifolia flore-pleno.*

P. cratægifolia (Hawthorn-leaved).* *fl.* white, showy, disposed in terminal corymbs; calyx campanulate; petals orbicular. *fr.* red, elliptic. *l.* ovate, acute, lobulate, pubescent, resembling those of *P. torminalis* in outline, but thinner. Northern Italy. Bush or small tree. (B. M. 7423.)

P. crenata (crenate), of Lindley. A synonym of *P. vestita.*

P. Cydonia (Cydonia). *See* **Cydonia vulgaris.**

P. discolor (two-coloured). A form of *P. Aria.*

P. fennica. According to the "Index Kewensis," *P. pinnatifida* is the correct name.

P. floribunda Halliana (Hall's). This is a variety with semi-double flowers; it is also known in gardens as *P. Parkmanni.*

P. f. Scheideckeri (Scheidecker's). *fl.* pink, flushed with rose, produced in great abundance all along the growths. 1896.

P. germanica (German). *See* **Mespilus germanica.**

P. Halliana (Hall's). A variety of *P. floribunda.*

P. heterophylla (variable-leaved). *l.* very variable, some smooth on the margin, some slit and almost filiform, but the majority almost intermediate between these two extremes. High mountains of Eastern Turkestan, 1890. (G. C. 1890, vii., p. 115, f. 18.)

P. intermedia (intermediate). Swiss Beam-tree. *fl.* white, racemosely corymbose; petals flat, spreading; corymbs flat. May. *l.* ovate, incised-lobed, toothed, appressedly white-tomentose beneath. *h.* 40ft. Europe, 1789. Allied to *P. Aria.* There are two varieties, *angustifolia* (narrow-leaved) and *latifolia* (broad-leaved).

P. japonica Moerlezii is described under *Cydonia.*

P. Kaido (Kaido). A form of *P. spectabilis.*

P. Malus armeniæfolia (Apricot-leaved). *l.* tomentose, resembling those of a Plum rather than those of an Apricot. A variety of Oriental origin. SYNS. *Malus armeniæfolia, M. dasyphylla.*

P. M. aurea (golden). *l.* yellow with the exception of a green patch in the centre. 1890. (R. G., t. 1425.)

P. M. austera (austere). A synonym of *P. M. acerba.*

P. M. flore-pleno (double-flowered). *fl.* at first pale rose, afterwards almost white, semi-double. SYN. *Malus Reevesii.*

P. M. John Downie. A very hardy free-flowering variety, producing large clusters of oval fruit of a brilliant red on the exposed side, and soft yellow on the shaded side. One of the best and most ornamental sorts.

Pyrus—*continued.*

P. M. paradisiaca. Paradise Apple. *fl.* pinkish-white, with a cottony calyx. April and May. *fr.* small, spherical, insipid. *l.* acuminate, very cottony when young, eventually glabrous above and pubescent beneath. *h.* 15ft. to 18ft. Central Russia.

P. Medwietzkyana (Medwietzky's). All parts of this tree, with the exception of the old leaves, are red, even the bark and wood. The pulp of the fruit, which has a fine flavour, is of a dark rosy colour. Siberia, &c., 1891.

P. melanocarpa (dark-fruited). A form of *P. arbutifolia*

P. microcarpa (small-fruited). A form of *P. americana.*

P. nepalensis (Nepaul). A synonym of *P. vestita.*

P. nivalis salvifolia (Sage-leaved). The correct name of *P. salvifolia.*

P. occidentalis (Western). An alpine Mountain Ash, recently introduced to American gardens. Washington, Oregon, &c. (G. & F. 1897, p. 86, f. 11.)

P. Parkmanni (Parkmann's). A synonym of *P. floribunda Halliana.*

P. parviflora (small-flowered). A synonym of *P. amygdaliformis.*

P. Pashia (Pashia). *fl.* white and pink, 1in. across; inflorescence very variable, usually corymbose with a very short peduncle and woolly, sometimes fascicled or umbellate. May. *l.* ovate or ovate-lanceolate, 2in. to 4in. long, acuminate, sometimes caudate, serrulated and three-lobed when young, glabrous when old. Temperate Himalaya, 1825. Tree. SYN. *P. variolosa.*

P. prunifolia pendula (pendulous). A weeping variety of the Siberian Crab.

P. Pyraster (Pyraster). A form of *P. communis.*

P. Ringo is now regarded as a species and not as a variety of *P. Toringo.*

P. salicifolia (Willow-leaved). *fl.* white, shortly pedicellate, disposed in few-flowered corymbs. May and June. *fr.* turbinate-globose. *l.* linear-lanceolate, acute, quite entire, very shortly petiolate, silvery-tomentose beneath. Branches spiny; buds white-tomentose. *h.* 20ft. Russia, &c., 1780.

P. sikkimensis (Sikkim). *fl.* pale pink, in many-flowered corymbs at the tips of the long peduncles; petals orbicular, velvety. *fr.* dark red, with white spots, obconical-pyriform, "very good stewed." *l.* ovate-lanceolate, acuminate, toothed, tomentose beneath. Sikkim Himalaya. Allied to *P. baccata.* (B. M. 7430.)

P. sinaica (Mount Sinai). *fl.* corymbose. *fr.* sub-globose. May. *l.* ovate-oblong, very minutely crenulate, sub-acute, glabrous above, whitish-pubescent beneath, tardily deciduous. Mount Sinai. Plant much-branched, diffuse; allied to *P. amygdaliformis.*

P. Sorbus is the correct name of *P. domestica.*

P. spectabilis magnifica (magnificent). A perfectly hardy variety, bearing fine bold trusses of lovely, deep rosy-pink blossoms. An improvement on *P. spectabilis.*

P. spuria (spurious). *l.* pinnate; leaflets ovate, crenate, hairy beneath, the terminal one larger; petioles glandular. *h.* 20ft. Origin unknown; a supposed hybrid between *P. Aucuparia* and *P. arbutifolia.*

P. thianschanica (Thianschan). A tree or small shrub, very similar to *P. Aucuparia*, but having the buds tomentose and the young leaves villous. Central Asia, 1890.

P. tomentosa (downy). *fl.* white. May and June. *l.* ovate-lanceolate, slightly crenulate, shortly petiolate, white-tomentose beneath. Branchlets tomentose. *h.* 20ft. Siberia, 1810.

P. Tschonoskii (Tschonosky's). *fr.* yellow, solitary or in groups of two or three, obovate, 1¼in. long. *l.* ovate, acuminate, dark green. *h.* 30ft. Japan, 1894. This is the indigenous Pear-tree of Japan, where *P. sinensis*, a common cultivated fruit tree in all parts of the empire, has occasionally become naturalised. (G. & F. 1894, p. 54, f. 9.)

P. ussuriensis is a form of *P. sinensis.*

P. variolosa (somewhat variable). A synonym of *P. Pashia.*

P. vestita (clothed). Himalayan Beam-tree. *fl.* white, in umbelliform corymbs, with a downy rachis. May and June. *l.* oblong-lanceolate or elliptic-acuminate, most densely woolly beneath and on both surfaces when young. *h.* 10ft. to 18ft. Temperate Himalayas. A pyramidal tree. SYNS. *P. crenata*, of Lindley (B. R. 1655), *P. nepalensis.*

PYTHIUM DE BARYANUM. *See* **Damping Off.**

PYTHONIUM. A synonym of **Thomsonia** (which *see*).

QUADRIALA. A synonym of **Buckleya** (which *see*).

QUENOUILLE. A form of fruit tree usually trained against a wall, and having a central stem, with the branches trained from it on each side in horizontal tiers, the lowest being the longest. The tree thus forms a perfect pyramid form. Fortunately this shape is seldom seen now; it has little to recommend it, as there is a great loss of wall space between the upper parts of the trees, while the natural tendency of such trees is to make strong growth at the top, which must frequently be checked by root-pruning.

QUERCUS. To the species and varieties described on pp. 263-6, Vol. III., the following should be added. Most of the common names are those used in North America.

Q. acroglandis (sharp-glanded). A synonym of *Q. agrifolia.*

Q. acuminata (taper-pointed). A variety of *Q. Prinus.*

Q. alnifolia (Alnus-leaved). Golden Oak. *fl.* rare. *fr.*, cup hemispherical, velvety-scaly, ½in. long; nut ½in. to 1¼in. long, obovoid-oblong. *l.* oval or roundish, 1in. to 1½in. long, entire or shortly toothed to the middle, shining above, densely golden-tomentose beneath. Cyprus, 1880. An evergreen, arborescent shrub, hardy only in very favoured localities. (Gn. 1880, xviii., p. 486.)

Q. americana aurea (golden). A synonym of *Q. rubra aurea.*

Q. a. splendens (American, splendid).* *l.* beautifully tinted with bronze and red. A graceful, garden variety.

Q. angustifolia (narrow-leaved). A garden synonym of *Q. acuta.*

Q. apennina (Apennine). *fl.* borne on a peduncle 2½in. to 4in. long. *l.* ovate, obtusely lobed, shortly petiolate, pubescent and rather cottony beneath, not falling till the end of the winter. Italy and Central France. Some authorities consider this to be a variety of *Q. Toza*, but the "Index Kewensis" refers it to *Q. Robur.* There is a golden-leaved form, *aurea.* 1885.

Q. apennina (of gardens). A synonym of *Q. Cerris.*

Q. aquatica. The Kew Hand-list places this as a synonym of *Q. nigra*: according to the "Index Kewensis," it is a distinct species.

Q. a. nana (dwarf). A garden synonym of *Q. heterophylla.*

Q. arcoglandis. A misprint for *Q. acroglandis.*

Q. austriaca sempervirens is synonymous with *Q. Turneri.*

Q. Ballota* is classed by some botanists as a variety of *Q. Ilex*; but it is distinct enough for specific rank.

Q. bambusæfolia. According to the Kew Hand-list, this is a form of *Q. acuta.* The "Index Kewensis" accords it specific rank.

Q. Brantii (Brant's). *fr.* solitary; cup 1¼in. long, greyish-velvety, hemispherical; nut slightly exceeding the cup. *l.* ovate or oblong from an often cordate base, more or less crenate-toothed, pubescent beneath, 3in. to 4in. long, 1½in. to 2in. broad; young ones dentate-serrated; petioles four to seven lines long. Kurdistan.

Q. californica (Californian). A synonym of *Q. Kelloggii.*

Q. castaneæfolia (Sweet Chestnut-leaved).* *fl.* solitary or ternate on short peduncles. *fr.* solitary or twin; cup hemispherical, silky-scaly, ¾in. broad; nut glabrescent, 1¼in. long. *l.* petiolate, 3in. to 6in. long, oblong or oblong-lanceolate, rounded or cordate at base, sparsely pilose above, pale or whitish-green and more pilose beneath, deeply and irregularly toothed. Branchlets and petioles minutely velvety. *h.* 60ft. Asia Minor, &c., 1846. A handsome, deciduous species.

Q. Cerris. Other varieties are *argentea variegata, cana major, c. minor, laciniata,* and *longifolia nova.*

Q. chrysolepis (golden-scaled). Californian Live Oak; Maul Oak. *fl.*, catkins 2in. to 4in. long, slender. May and June. *fr.* usually solitary, sessile or short-stalked; cup hemispheric or turbinate; nut light chestnut-brown, oval or ovate, ½in. to 2in. long. *l.* oblong-ovate to elliptical, 1in. to 4in. long, ½in. to 2in. broad, cordate, rounded, or cuneate at base, acute or cuspidate at apex, entire on old trees, often toothed or sinuate-toothed on young ones, glabrous above, fulvous-tomentose and ultimately bluish-white beneath; petioles rarely ½in. long. *h.* 40ft. to 50ft. California, &c. Evergreen. Rather tender.

Q. coccinea. Of the several garden varieties may be mentioned: *macrophylla* (large-leaved) and *pendula* (drooping). *Q. tinctoria* (which has been classed hereunder as a variety) is synonymous with *Q. velutina.*

Q. crispula (slightly crisped). *l.* almost sessile, elliptic- or obovate-oblong, obtuse or sub-cordate at base, acutely, deeply, and unequally serrate-lobed, 2in. to 7in. long, ¾in. to 3½in. broad, slightly pilose when young; lobes ovate, acute, slightly toothed. Japan. Evergreen. There is a variety *grosseserrata* (deeply serrated).

Quercus—*continued.*

Q. cuneata (wedge-shaped). According to the Kew Hand-list, this is the correct name of *Q. falcata*; the "Index Kewensis" keeps up the latter name.

Q. cyclophylla (round-leaved). A synonym of *Q. Ballota.*

Q. Daimyo (native name). A synonym of *Q. dentata.*

Q. dentata (toothed).* *fl.* in dense catkins 1½in. or more in length. *l.* sub-sessile, 3in. to 10in. or more in length, 2in. to 6in. broad, obovate or obovate-oblong, obtuse at both ends, lobed or crenate in a great variety of ways, stellate-pilose when young, glabrous above when old; petioles ½in. long; stipules ½in. long. Japan. A very fine, deciduous species, of free growth. SYN. *Q. Daimyo.*

Q. d. pinnatifida (pinnatifid). *l.* pinnatisect, attaining about 1ft. in length. 1888.

Q. discolor (two-coloured). A synonym of *Q. velutina.*

Q. Douglasii (Douglas's). Blue Oak; Mountain White Oak. *fl.*, catkins hairy; females in short, hairy spikes. February to April. *fr.* sessile or short-stalked, solitary or twin, very abundant; cup thin and shallow, green; nut broadly ovate, acute, ½in. to 1in. long. *l.* oblong, lobed, spinescent, or entire, bluish-green and pubescent, 2in. to 5in. long, very variable in shape; petioles stout, ½in. to ½in. long. *h.* 50ft. to 90ft. California. Deciduous.

Q. echinacea (prickly). A synonym of *Q. densiflora.*

Q. Farnetto is the name adopted by the "Index Kewensis" for *Q. conferta*, but the Kew Hand-list keeps up the latter name.

Q. fastigiata (pyramidal). A variety of *Q. pedunculata.*

Q. ferruginea is, according to the Kew Hand-list, a synonym of *Q. marilandica.*

Q. Fontanesii (Fontanes'). A synonym of *Q. Pseudo-suber.*

Q. Gambellii (Gambell's). White or Shin Oak. *fl.*, catkins slender, hairy; females bright red. May and June. *fr.* sessile or stalked; cup enclosing one-third of the nut, which is usually ovate, rusty-pubescent, ½in. to 1in. long. *l.* broadly obovate to oblong-lanceolate, 3in. to 5in. long, yellowish and pubescent below, variously lobed or pinnatifid, turning scarlet or orange in the autumn, the lobes entire, emarginate, or lobed; petioles persistent. *h.* 3ft. to 20ft. (according to locality). Colorado, &c.

Q. Garryana (Garry's). White Oak. *fl.*, catkins hairy. *fr.* sessile or shortly stalked; cup cup-shaped or turbinate; nut ovate or slightly obovate, 1in. to 1½in. long, sweet. *l.* obovate or oblong, cuneate or rounded at base, coarsely pinnatifid-lobed, thick and firm, 4in. to 6in. long; lobes seven to nine, the terminal one sometimes three-lobed; petioles stout, pubescent, ½in. to nearly 1in. long. *h.* 50ft. to 100ft. (in exposed places reduced to a shrub). North-west America.

Q. georgiana (Georgian). *fr.* abundant, shortly pedunculate; cup smooth and shining, saucer-shaped, enclosing one-third of the ovate-globose nut, which is ½in. long. *l.* 3in. to 4in. long, smooth, somewhat obovate, cuneate at base, with deep or shallow open sinuses, and three to five triangular-lanceolate, entire, acute or obtuse lobes, turning scarlet in autumn. *h.* 6ft. to 8ft. Georgia, 1888. A low, spreading bush.

Q. glandulifera (of Masters). A synonym of *Q. Turneri.*

Q. heterophylla (variable-leaved). Bartram's Oak. *fl.*, catkins hairy, 2in. to 3in. long. May. *fr.* sessile or short-stalked, sparingly produced; cup light reddish-brown, enclosing half the nut, which is ½in. long, light yellow or reddish-brown. *l.* lanceolate or oblong-obovate, entire, sinuately spinulose-toothed, coarsely serrated, or with entire, bristle-pointed lobes. *h.* 30ft. to 40ft. United States. Deciduous. SYNS. *Q. aquatica nana* (of gardens), *Q. Phellos-velutina.*

Q. hispanica (Spanish). A synonym of *Q. Pseudo-suber.*

Q. hungarica (Hungarian). A synonym of *Q. conferta.*

Q. Ilex. Other varieties are *diversifolia* (variable-leaved), *Genabii, macrophylla* (large-leaved), *rotundifolia* (round-leaved), *Smilax,* and *undulata* (wavy-leaved).

Q. I. Ballota. *See* **Q. Ballota.**

Q. imbricaria-palustris (hybrid). A hybrid between the species indicated in the name is grown in the Kew Arboretum.

Q. Kelloggii (Kellogg's). *fl.*, catkins hairy, 4in. to 5in. long. April and May. *fr.* stoutly pedunculate, solitary or clustered; cup light brown, cup-shaped; nut oblong to obovate, 1in. to 1½in. long. *l.* oblong or obovate, 3in. to 6in. long, glabrous or pubescent below, pinnatifid-lobed, the lobes tapering and acute or broad and obovate, repand-toothed or entire, turning yellow or brown in autumn; petioles slender, 1in. to 2in. long. *h.* (in favourable situations) 100ft. Oregon and California. SYNS. *Q. californica, Q. nigra Barroni.*

Q. kermesina (crimson). A garden synonym of *Q. coccifera.*

Q. lanceolata (lanceolate). *fr.* often twin, sub-sessile or shortly pedunculate; cup ½in. long, reflexed-scaly; nut half-exserted. *l.* elliptic-lanceolate, acute or obtuse at base, bristly-acuminate to obtuse at apex, entire or toothed,

Quercus—*continued.*

scarcely persistent. Mexico (where it attains 30ft. to 50ft.). A rather tender tree, only assuming the dimensions of a shrub in our Southern districts.

Q. lanuginosa (woolly). *l.* not large, sometimes sub-sinuate, sometimes pinnate or pinnatifid, above sparsely pilose, at length glabrous, pale-tomentose beneath; petioles ¼in. to ½in. long. Europe and Western Asia. Deciduous. Formerly classed as a form of *Q. Robur*, to which it is related.

Q. laurifolia (Laurel-leaved).* Water Oak. *fl.*, catkins 2in. to 3in. long. March and April. *fr.* sessile or sub-sessile, generally solitary; cup saucer-shaped, reddish-brown, hairy-pubescent; nut ½in. long, nearly ovoid. *l.* oblong-oval or oblong-obovate, sometimes falcate, narrowed and acute or rarely rounded at base, acute or bristly at apex, entire, usually 3in. to 4in. long and ¾in. broad, changing to yellow in autumn; those on vigorous branches sometimes unequally lobed; petioles ½in. long. *h.* sometimes 100ft. North America, 1786.

Q. Leana. Lea's Oak. By its characters and by the foliage of the second generation, Dr. Asa Gray considers that this is pretty clearly a hybrid between *Q. imbricaria* and *Q. coccinea tinctoria*. North America. Deciduous.

Q. lobata (lobed). Valley Oak. *fl.*, catkins hairy, 2in. to 3in. long. April. *fr.* solitary or in pairs, sessile or sub-sessile; cup ½in. to nearly 1in. long, pale-tomentose; nut conical, 1½in. to 2½in. long, with a thick umbo at apex. *l.* thin but firm, 2½in. to 4in. long, oblong or obovate, deeply lobed, pale and pubescent beneath; lobes seven to eleven, the terminal one somewhat three-lobed; petioles broad, hairy, ½in. to ¾in. long. *h.* sometimes 100ft. California. Deciduous.

Q. lusitanica (Portuguese). *fr.* sessile or shortly pedunculate, solitary or few; nut twice to four times exceeding the greyish-velvety cup. *l.* sometimes persistent, obovate-oblong or obovate, very variably toothed or lobed. *h.* 40ft. Mediterranean region, 1824. A very polymorphous, rather tender species.

Q. l. Boissieri (Boissier's). *l.* oblong, rarely entire, often regularly and deeply crenate-serrate, the lobes obtuse or sub-acute; petioles ½in. to ¾in. long.

Q. l. petiolaris (prominently-petiolate). *l.* usually few-toothed or entire; petioles ½in. to 1in. long.

Q. macedonica (Macedonian). *fr.* large, sessile, solitary or in twos and threes; cup hemispherical, pubescent; nut included or shortly exserted, edible. *l.* 2in. to 3in. long, somewhat coriaceous, glabrous, rounded or truncate-subcordate at base, denticulate or crenate-repand; petioles very short. Orient, 1892. Deciduous.

Q. marilandica (Maryland). Black Jack; Jack Oak. *fl.*, catkins hairy, 2in. to 4in. long. May. *fr.* solitary or in pairs, usually on stout stalks; cup enclosing one-third to two-thirds of the nut, which is oblong, light yellowish-brown, about ¾in. long. *l.* 3in. to 8in. long, 2in. to 8in. broad, broadly obovate, dilated and often three- or rarely five-lobed at apex, rusty-pubescent below, turning brown or yellow in autumn; petioles stout, yellow, ½in. to ¾in. long. *h.* 20ft. to 50ft. United States. SYN. *Q. ferruginea*.

Q. Michauxii (Michaux').* Basket Oak; Cow Oak. *fl.*, catkins slender, hairy, 3in. to 4in. long. May. *fr.* solitary or in pairs, sessile or nearly so, stout-stalked; cup hoary-tomentose, enclosing one-third of the nut, which is bright brown, sweet, 1in. to 1½in. long. *l.* 6in. to 8in. long, broadly obovate or oblong-obovate, cuneate or rounded at the broad or narrow base, undulate-lobed, tomentose or pubescent and often silvery-white beneath, turning rich crimson in autumn; petioles ½in. to 1½in. long. *h.* sometimes 100ft. Southern United States.

Q. minor (lesser). A synonym of *Q. stellata*.

Q. Mirbeckii (Mirbeck's). *l.* rarely acute at base, usually obovate or elliptic, obtuse or acute, often 3in. long and 1½in. to 2in. broad, crenate or toothed. This is usually regarded as a variety of *Q. lusitanica*. SYN. *Q. Sang*.

Q. nigra Barroni (Barron's). A synonym of *Q. Kelloggii*.

Q. palustris Reichenbachi (Reichenbach's). In this variety the leaves are red from their first opening. 1896.

Q. pedunculata argenteo-variegata (silver, variegated). A pretty variegated variety of the type.

Q. p. asplenifolia (Asplenium-leaved). A synonym of *P. pedunculata ilicifolia*.

Q. p. atropurpurea (dark purple). A synonym of *Q. p. purpurascens*.

Q. p. comptoniæfolia (Comptonia-leaved). *l.* cleft into numerous short divisions. It is also known in gardens as *Fennesii*.

Q. p. Doumeti (Doumet's). *l.* cut to the midrib into elongated lobes, more or less undulated and twisted. 1894. (R. H. 1894, f. 3.)

Q. p. elegantissima (most elegant). A synonym of *Q. p. variegata*.

Q. p. Fennesii (Fennes'). A synonym of *Q. p. comptoniæfolia*.

Quercus—*continued.*

Q. p. foliis-aureis (golden-leaved). A synonym of *Q. p. Concordia*.

Q. p. nigra (black). *l.* blackish or wine-red, glaucous and pruinose.

Q. p. pectinata (comb-like).* *l.* deeply cut, graceful, light and elegant. Also known as *pinnata*.

Q. p. pinnata (pinnate). A synonym of *Q. p. pectinata*.

Q. p. pubescens (downy). *l.* more or less pubescent beneath. Branches velvety. France.

Q. p. salicifolia (Willow-leaved). *l.* elongated, lanceolate, entire.

Q. p. scolopendrifolia (Scolopendrium-leaved). *l.* resembling the fronds of a tiny Hartstongue Fern.

Q. p. umbraculifera (umbrella-bearing). A variety of broadly globose habit, raised from acorns of *Q. p. fastigiata*. 1896.

Q. Phellos-velutina (hybrid). A synonym of *Q. heterophylla*.

Q. phillyræoides (Phillyræa-like). *fr.*, cup whitish-tomentose, saucer-shaped, much shorter than the nut. *l.* elliptic or obovate-oblong, 1½in. long, obtuse at base, entire or serrated towards the apex, coriaceous; nerves and petioles fulvous-velvety. Branches secund. Japan. Evergreen. SYN. *Q. rotunda* (of gardens).

Q. platanoides (Platanus-like). A synonym of *Q. bicolor*.

Q. pontica (Pontic). *fl.*, catkins borne below the leaves, long, pendulous. *fr.* small; nut sub-globose, twice as long as the scaly cup. *l.* 5in. to 6in. long, elliptic, coarsely toothed, glabrous above, paler beneath. Branchlets highly glabrous. Pontic Mountains, Asia Minor, 1891. A deciduous, dwarf shrub or tree. (R. G. 1891, p. 509, f. 95.)

Q. prinoides (*Prinus*-like). Chinquapin Oak. *fl.*, catkins hairy, 1½in. to 2½in. long. May. *fr.* sessile or short-stalked, profusely borne; cup hoary-tomentose, enclosing half to two-thirds of the sweet, chestnut-brown nut, which is ½in. to ¾in. long. *l.* 3in. to 6in. long, usually obovate-oblong, cuneate at base, undulate-toothed, softly pubescent and often silvery-white below, turning bright orange and scarlet in autumn; petioles stout, ½in. to ¾in. long. United States.

Q. Prinus acuminata (taper-pointed). Yellow Chestnut Oak. *fr.*, cup hemispherical, thin, of small, appressed scales; nut seven to nine lines long. *l.* Chestnut-like, slender-petiolate, often oblong or even lanceolate, usually acute or pointed, obtuse or rounded at base, sharply toothed. North America, 1822. A medium-sized tree.

Q. pseudo-coccifera (False Kermes Oak). *fr.*, cup hemispherical; nut ovoid, often ¾in. to 1½in. long. *l.* oval or elliptic, acute, spiny-toothed, cordate at base, very shortly petiolate, glabrous above, larger than those of *Q. coccifera* (to which this species is closely allied). *h.* 15ft. to 18ft. Central and South Europe. According to C. S. Sargent, this evergreen species is the most abundant tree of Syria. To it belongs the famous Oak of Mamre, known as David's Oak. (G. & F. ii., p. 602, f. 153.)

Q. pumila (dwarf). Running Oak. *fl.*, catkins villous, 2in. to 3in. long. April. *fr.* sessile or nearly so, usually solitary; cup red-brown-scaly, saucer- or cup-shaped; nut sub-globose, dark chestnut-brown, about ½in. long. *l.* 1in. to 4in. long, oblong, elliptic, lanceolate, or oblong-obovate, usually entire, coated below with pale pubescence, falling in the spring; petioles rarely ¼in. long. *h.* 10ft. to 12ft. North California, &c. A shrub, spreading by underground stolons and forming huge thickets in its native places.

Q. rotunda (round). A garden name for *Q. phillyræoides*.

Q. rubra. There are two varieties—*aurea* (golden-leaved) and *pendula* (drooping).

Q. Sang (Sang). A synonym of *Q. Mirbeckii*.

Q. Schochiana (Schoch's). A hybrid between *Q. Phellos* and *Q. palustris*. 1892.

Q. sclerophylla is identical with *Q. Turneri*.

Q. serrata. Of this species there is a drooping variety, *pendula*.

Q. sessiliflora. The following forms are in cultivation, though some are rare: *afghanistensis, alnoides* (Alder-leaved), *Devoniana, dschorochensis, falconbergensis, iberica, laciniata* (deeply cut), *mespilifolia* (with pretty, narrow, Willow-like leaves; should be grown in a moist soil), *pendula* (drooping), and *variegata* (variegated). The form *cucullata* is identical with *cochleata*.

Q. Tauzin. A synonym of *Q. Toza*.

Q. texana (Texan). Red Oak. *fl.*, catkins slightly pubescent, 2in. to 3in. long. May. *fr.* sessile or short-stalked, usually solitary; cup light-brown-scaly, tomentose; nut oval, abruptly narrowed and rounded at base, light brown, sometimes striated, ½in. to 1½in. long. *l.* 2½in. to 6in. long, obovate, truncate or cuneate at base, deeply pinnatifid-lobed with broad, rounded sinuses, the lobes sinuate-toothed at the usually broad apex, usually turning dark vinous-red in autumn; petioles reddish, 1in. to 2in. long. United States. (G. & F. 1894, p. 514, f. 81-2.)

Quercus—*continued.*

Q. tinctoria. The correct name is *Q. velutina.*

Q. Toumeyi (J. W. Toumey's). *fr.* sessile, solitary or twin; cup shallow; nut oval or acute, ½in. to ¾in. long. *l.* thin but firm, light bluish-green, ½in. to ¾in. long, ovate or ovate-oblong, entire or remotely spinose-toothed, puberulous beneath, probably falling with the new growth in spring; petioles stout, ½in. long. *h.* 25ft. to 30ft. Arizona, 1894. (G. & F. 1895, viii., p. 92, f. 13, 14.)

Q. Turneri (Turner's). *fl.* borne on short peduncles. *fr.* clustered, ripening the first year; cup hemispherical, densely covered with small, obtuse, ciliolate scales; nut ellipsoid, acute, rather more than twice the length of the cup. *l.* oblong, obtuse, distantly toothed. A pyramidal, evergreen tree, of garden origin—perhaps a hybrid between *Q. Ilex* and *Q. pedunculata* or *Q. Cerris.* SYNS. *Q. austriaca sempervirens, Q. glandulifera,* of Masters (G. C. 1880, xiv., pp. 714-5, f. 134), *Q. sclerophylla.*

Q. undulata (wavy). Scrub or Shin Oak. *fl.*, catkins tomentose, 1in. to 2in. long. *fr.* solitary or twin, on stout stalks; cup hoary-tomentose; nut oval, ¾in. to 1in. long. *l.* 1in. to 3in. long, oblong, sinuate-toothed, entire, pinnatifid, lobed, or spiny, bluish-green, pubescent; petioles stout, ½in. to nearly 1in. long. *h.* 2ft. to 25ft. Western North America. Deciduous.

Q. velutina (velvety). The correct name of *Q. tinctoria.* SYN. *Q. discolor.*

Q. Wislizeni (Wislizen's). *fl.*, catkins hairy, 3in. to 4in. long. Early spring. *fr.* sessile, short-stalked, or occasionally spicate; cup shallow or tubular and 1in. deep; nut slender, ¾in. to 1¼in. long, light chestnut-brown, often striate. *l.* ½in. to 5in. long, usually oblong-lanceolate, entire, serrated or sinuate-toothed, dark green and lustrous, falling the second year; petioles ½in. to 1in. long. *h.* 70ft. to 80ft. California.

The following are also grown in botanical establishments: *Q. Dalechampii, Q. infectoria, Q. macrantha, Q. mongolica,* and *Q. variabilis.*

QUESNELIA. SYN. *Lievena.* According to J. G. Baker, about a dozen species, natives of Brazil and Guiana, are now referred to this genus, which differs from *Billbergia* in its usually spicate inflorescence, shorter and less spreading petals, and alternate stamens attached to the top of the claw of the petals. To the species described on p. 266, Vol. III., the following should be added:

Q. cayennensis (Cayenne). The correct name of *Billbergia Quesneliana* (F. d. S. 1023; R. G. 1875, tt. 834, 836). SYN. *Q. rufa* of E. Morren (B. H. 1882, p. 115, tt. 4-6).

Q. columbiana (Columbian). *fl.*, petals violet, twice as long as the calyx; spike few-flowered, lax, simple, erect, 2in. to 3in. long; peduncle hidden by the connivent bases of the leaves. March. *l.* about a dozen in a rosette, lorate, arcuate, 1½ft. to 2ft. long, 1½in. to 2in. broad, brown at back, the marginal prickles close and minute. Columbia, 1882. SYN. *Ronnbergia columbiana.*

Q. Enderi (Ender's). *fl.*, petals violet, twice as long as the sepals; spike dense, oblong, few-flowered; bracts tinged with red, the lower ones 1ft. long; peduncle slender, above 1ft. long. *l.* eight to ten in a rosette, lorate, 2ft. long, 2in. broad, rounded to a cusp at apex, the prickles hooked. South Brazil. (R. G. 1888, p. 195, tt. 41-3.) SYNS. *Billbergia Enderi* (R. G. 1217), *Q. lateralis.*

Q. lateralis (lateral). A synonym of *Q. Enderi.*

Q. princeps (chief), of gardens. A synonym of *Q. rufa.*

Q. roseo-marginata (rosy-margined). A synonym of *Q. rufa.*

Q. rufa (red). The correct name of *Billbergia roseo-marginata.* SYNS. *Lievena princeps* (R. G. 1024), *Q. princeps* (of gardens), *Q. roseo-marginata* (B. H. 1881, p. 82, t. 4; R. H. 1880, p. 70), *Q. Skinneri* (of gardens). *Q. rufa* of E. Morren is synonymous with *Q. cayennensis.*

Q. Skinneri (Skinner's). A garden synonym of *Q. rufa.*

Q. strobilispica (cone-spiked). *fl.* in a dense, ovate-oblong spike; sepals white-woolly, elliptic-oblong; petals at first violet-rose, at length reddish-brown, oblong, erect, cucullate-obtuse towards the apex; bracts elliptic-oblong, imbricated; scape red, white-woolly, one-third shorter than the leaves. *l.* coriaceous, channelled, ligulate, acuminate, 2½ft. to 3ft. long, 2½in. broad, dark green and glabrous above, dark green with silvery-lepidote horizontal zones beneath, the margins shortly spiny-toothed. Brazil, 1835. SYN. *Billbergia Glaziovii* (R. G. 1203).

Q. Van Houtteana.* The correct name of the very beautiful *Q. Van Houttei.*

Q. Wittmackiana (Wittmack's). *fl.*, calyx red; petals blue; raceme dense, few-flowered; bracts very small; peduncle much shorter than the leaves. *l.* ensiform, rigid, nearly erect, 3½ft. to 4ft. long, 1½in. broad, fasciated with white on the back, the marginal teeth minute. Probably South Brazil, 1888. (R. G. 1888, t. 1281, f. 2.)

QUICK. A popular name for *Cratægus Oxyacantha* when employed for making a living hedge.

QUILLWORT. *See* **Isoetes.**

QUIN-. A Latin prefix meaning five.

QUINA, QUINO, or **QUINQUINA.** *See* **Cinchona.**

QUINCUNX. The planting of vegetables or fruit trees in rows with the plant or tree midway between the two plants in the next row, or, as gardeners term it, "planting alternately," is the old name employed to distinguish this system of arranging the plants or trees.

QUININE. *See also* **Remijia pedunculata.**

QUIVISIA. *Q. chilosantha* is the correct name of *Turræa rigida.*

RABBIT BERRY. *See* **Shepherdia argentea.**

RACEMULOSE. In small racemes; resembling a small Raceme.

RADISH. The following additions to the list of varieties in Vol. III. are worth recording:

DEEP SCARLET OLIVE-SHAPED EXTRA EARLY (Vilmorin), one of the earliest and best varieties in cultivation, coming into use very quickly, and of mild flavour; a very short top, and excellent for forcing. THE SUTTON, roots long; flesh very white, tender, and good, and withstands drought well. WHITE OLIVE-SHAPED EXTRA EARLY (Vilmorin), a splendid variety, of mild and excellent flavour, and, like the Scarlet Olive-shaped, is one of the earliest; excellent for forcing or sowing outside.

RAFNIA includes *Vascoa.*

RAG. A gardener's word for the core and membranes in the Orange and allied fruits.

RAGS. Within recent years waste material from cloth and Rags has been utilised to make a very useful manure known as "Shoddy." The waste from cloth factories, tailors', and other places is cut up or shredded into small pieces and sold at a cheap rate to hop growers, fruit and vegetable farmers, and is applied by them in various quantities per acre—about 5cwt. is the usual quantity per acre—and the effect on some land is very marked by the healthy growth of the crops, especially where the "Shoddy" has been put on heavy land. Hops particularly seem to appreciate this manure.

RAGWORT, SEA. *See* **Cineraria maritima.**

RAILINGS. Iron fencing or Railing has practically ousted the old post and rail oak fence. Yet, when well put up, and the posts charred or tarred at the base before they are bedded in the soil, the latter has much to recommend it. It is strong, durable, rustic-looking, and excellently adapted for keeping cattle out of plantations, or to protect young fences of Quick, Holly, &c., until they are able to take care of themselves. For dividing parks and similar open expanses, iron Railings are preferable, as they are practically invisible in the distance, and thus do not obstruct the view, as would be the case with wooden Railings.

RAJANIA. A synonym of **Brunnichia** (which *see*).

RAMIFORM. Branch-like.

RAMONDIA includes *Jankæa. R. serbica Nathaliæ** is a variety having deeper and brighter coloured flowers than the type.

RAMOON-TREE. *See* **Trophis.**

RAMTILLA. A synonym of **Guizotia** (which *see*).

RANDIA. *Canthium chinense* and *C. coronatum* are synonymous with *R. dumetorum.*

RANTRY or ROWAN-TREE. *See* **Pyrus Aucuparia.**

RANUNCULUS. As a florist's flower the Ranunculus has gone out of favour. Occasionally, however, one finds a bed of these, and the effect is very fine (Fig. 643). The dwarf species are oftener seen, as they make capital subjects for the rockery.

Ranunculus—*continued.*

To the species described on pp. 273-5, Vol. III., the following should be added. *R. aconitifolius*, *R. amplexicaulis*, *R. anemonoides*, *R. asiaticus*, *R. cortusæfolius*, *R. gramineus*, and *R. parnassifolius* are perennials.

R. aconitifolius grandiflorus (large-flowered). A beautiful variety with very large flowers.

R. affinis validus (related, true). The correct name of *R. cardiophyllus*.

R. anemonoides. This is a form of *Callianthemum rutæfolium*.

R. Buchanani (Buchanan's). *fl.* pure white, 2in. or more in diameter; scape 6in. to 12in. high, one-flowered. *l.* two or three times trifidly divided. New Zealand (up to 7000ft.), 1890.

R. bulbosus flore-pleno (double-flowered).* Cuckoo Bud. A very fine double-flowered variety.

R. bullatus (blistered). *fl.* orange-yellow, large, scented; scape naked, one-flowered. May. *l.* all radical, petiolate, ovate, toothed. Root tuberous. *h.* 1ft. South Europe, 1640. Not very hardy, but a good border species.

R. cardiophyllus. The correct name is *R. affinis validus*.

R. carpaticus (Carpathian).* *fl.* golden-yellow, 2in. in diameter. May. *l.* nearly orbicular in outline, palmate, crenate. Stem 1ft. high. Rootstock creeping. Eastern Hungary, 1892. A distinct and showy perennial. (B. M. 7266.)

R. crenatus (crenate). *fl.* white, large; calyx glabrous; petals five, obovate, almost entire, crenate at apex; scape one-flowered, 3in. to 4in. high. June and July. *l.* roundish-cordate, crenate at apex. Hungary, 1818.

FIG. 643. A BED OF RANUNCULUS.

R. Ficaria flore-pleno. A beautiful double variety of the Lesser Celandine.

R. fumariæfolius is a form of *R. millefoliatus*.

R. hybridus (hybrid). *fl.* yellow; scape one- to three-flowered. May. *l.* highly glabrous; radical ones long-petiolate, reniform, crenate-lobed; cauline ones two, shortly petiolate, lobed at apex. Root tuberous. *h.* 9in. Austrian Alps, 1820.

R. illyricus (Illyrian). *fl.* yellow; calyx slightly reflexed. May. *l.* silky-woolly; the first ones entire, linear-lanceolate; the rest tripartite, with entire or tripartite linear lobes. Stems erect, many-flowered. Root tuberous. *h.* 1½ft. South Europe, 1596. (J. F. A., t. 222.)

R. isopyroides. The correct name is *Callianthemum rutæfolium*.

R. nyssanus.* *fl.* of a shining citron-yellow, large and numerous. May. A showy plant.

R. polyanthemos (many-flowered). *fl.* yellow; calyx hairy; peduncles sulcate. *l.* palmately three- to five-parted, with the lobes somewhat linear. Stems erect, many-flowered, and, as well as the spreading petioles, pilose. Root fibrous. Central Europe.

R. pyrenæus (Pyrenean).* *fl.* white; scape or peduncle tomentose at apex, one- or several-flowered. June to August. *l.* linear or lanceolate, entire. *h.* 1ft. Alps and Pyrenees, 1807. A beautiful subject when freely planted.

Ranunculus—*continued.*

R. Seguieri (Seguier's).* *fl.* white, ¾in. in diameter; petals five, entire, orbicular, longer than the calyx. June and July. *l.* three-parted, with acute or bluntish, entire, trifid partitions; floral ones small, sessile, entire or trifid. Stem one- to three-flowered. *h.* 3in. Alps, 1819. (R. G. 1192, f. 1 [1194, f. 1, in text]).

R. Sonnieri (Sonnier's). *fl.* bright yellow, large. *l.* large, deeply cut. Caucasus, 1897.

R. speciosus (showy). A good form of *R. bulbosus*.

R. Thora (Thora). *fl.* yellow, two or three on a glabrous scape. May. *l.* highly glabrous; radical ones petiolate; cauline ones sessile, reniform, crenate. Root tuberous. *h.* 9in. Jurassic Alps, 1710.

R. Traunfellneri (Traunfellner's).* A pretty form of *R. alpestris*.

RAPE (Edible-rooted). This vegetable is seldom grown, probably owing to the small size of the root, which is long, white, Carrot-shaped, and about the thickness of the thumb. Seed should be sown in January on rather poor ground, not recently manured, otherwise the roots will be forked. From this sowing, roots will be ready for use in May. For later supplies seed may be sown in a cooler position, where the plants would get shade during the hottest part of the day, as they enjoy comparative coolness and moisture. As the seedlings advance they ought to be thinned to about 10in. apart. To prepare the roots for use, the skin is scraped off, and they are boiled like Turnips.

RAPHANUS. To the species described on p. 276, Vol. III., the following should be added:

R. caudatus is a form of *R. sativus*.

R. isatoides (Isatis-like). *fl.* yellow, in racemes terminating the side branches. *l.*, radical ones lyrate-pinnatisect; cauline ones ovate-lanceolate, amplexicaul, thick, glaucous. 1886. A garden variety of Radish, with the general aspect of *Isatis tinctoria*. (R. H. 1886, p. 372, f. 101.)

RAPHIA. *R. pedunculata* is the correct name of *R. Ruffia*; and, according to the "Index Kewensis," *R. tædigera* is identical with *R. vinifera*. *R. Hookeri* is in cultivation at Kew.

RAPHIDOPHORA (of Hassk.). A synonym of **Epipremnum** (which *see*).

RAPHIDOPHYLLUM. A synonym of **Sopubia** (which *see*).

RAPHIOLEPIS is the correct spelling of *Rhaphiolepis*.

RASPAILIA. A synonym of **Polypogon** (which *see*).

RASPBERRY. The most serious diseases of fungoid origin affecting Raspberries are the Rust described in Vol. III.—*Phragmidium Rubi-Idæi*—and Raspberry Anthracnose (*Gloeosporium venetum*), a very formidable pest in America. The latter, as the popular name suggests, is chiefly characterised by a spotting, alike of the foliage and the canes. The spots are minute and reddish when they are first noticed on the canes in summer, but later they increase in size and coalesce. They then have white centres, with dark purple margins. The spores are distributed, and the disease, unless controlled, assumes alarming proportions. The mycelium is perennial, and the second season usually proves fatal to the canes. At least, this is the opinion of Miss Detmers and others who have made the disease a special study.

For this, as well as for the Rust already named, weak Bordeaux Mixture is the best fungicide to employ. The time for the application in the case of Raspberry Anthracnose is, says Mr. W. J. Green, first, in spring, before the leaves have expanded; secondly, when the young canes begin to push; thirdly, fourteen days after

Raspberry—*continued.*

the latter spraying, paying special attention to the young canes; and lastly, just prior to the flowering period. As Raspberry foliage is somewhat susceptible, care should be taken to test the Bordeaux Mixture before spraying in quantity. About quarter strength has been found to be effective and non-injurious to the plants. All the old canes should also be removed and burned as a precautionary measure.

The following are additional varieties to those given in Vol. III.:

Norwich Wonder. Fruit large, deep red, of excellent flavour. A vigorous grower, and very free bearer. Much esteemed by market growers.

Semper Fidelis. Fruit large, red, somewhat acid in flavour. A great and continuous bearer, fruiting after most of the summer varieties are over.

Superlative. Fruit very large, conical, deep red, and of fine flavour. Footstalks long, canes stout, and very fruitful. A new variety of great excellence that has rapidly become popular.

White Magnum Bonum. Fruit medium, sweet and agreeable flavour. A superior variety to the YELLOW ANTWERP.

RASPBERRY BRAND, or **RASPBERRY RUST.** *See* **Raspberry—Fungi,** Vol. III.

RASPBERRY-BLACKBERRY. Under the name of Mahdi, a hybrid has reen raised by crossing the common Blackberry with Raspberry Superlative. The credit for this is due to Messrs. J. Veitch and Sons, Chelsea. The growth somewhat resembles that of the Blackberry, but shows distinct traces of Raspberry blood. The fruit is large, produced in clusters, dark purplish-red in colour, and intermediate between its parents in flavour.

RAT'S TAIL CACTUS. A very appropriate common name for *Cereus flagelliformis.*

RATTLESNAKE FERN. *See* **Botrychium virginianum.**

RAUWOLFIA. To the species described on p. 279, Vol. III., the following should be added:

R. canescens (hoary). *fl.* reddish, small; cymes axillary, few-flowered. *l.* quaternately whorled, elliptic, ovate, or obovate, acute at both ends, the larger ones 2in. to 3in. long, tomentose beneath; petioles ¼in. long. Branches somewhat tomentose. *h.* 7ft. West Indies, 1759. SYN. *R. hirsuta. R. tomentosa* is a white-flowered form of this species.

R. hirsuta (hairy). A synonym of *R. canescens.*

R. tomentosa (downy). A form of *R. canescens.*

RAVENSARA (from the Malagasy words *raven,* leaf, and *sara,* good; in reference to the strong clove-like odour of the leaves). Madagascar Nutmeg. SYNS. *Agathophyllum, Evodia* (of Gærtner). ORD. *Laurineæ.* A small genus (three or four species) of highly aromatic, glabrous, stove trees, only found in Madagascar. Flowers small; perianth tube turbinate or obovoid, the limb of six nearly equal segments; perfect stamens nine; panicles few-flowered, pedunculate in the upper axils. Leaves sparse, leathery, penniveined. *R. aromatica,* the only species known to cultivation, is described as *Agathophyllum aromaticum* on p. 36, Vol. I.

RAXOPITYS. A synonym of **Cunninghamia** which *see*).

REA. A synonym of **Dendroseris** (which *see*).

RED ADMIRAL BUTTERFLY. *See* **Vanessa.**

RED BAY. *See* **Persea carolinensis.**

RED CURRANT. *See* **Currant.**

RED GUM. *See* **Eucalyptus resinifera.**

RED MAHOGANY. *See* **Eucalyptus resinifera.**

RED PUCCOON. *See* **Sanguinaria.**

RED SPIDER (*Tetranychus telarius*). This mite inflicts the greatest injury upon plants under glass, and is especially destructive to Vines. Sulphur in some form is still the best remedy to employ, but to be of the greatest service Vineries and such-like places must have a moist atmosphere. A dry atmosphere is very favourable to the development of the pest, and must be guarded against. Outside, one of the preparations containing sulphur in some form should also be employed, using the syringe freely whenever possible. As stated in

Red Spider—*continued.*

Vol. III., the Red Spider is neither an insect nor a Spider proper, though it approximates to the latter. The illustration (Fig. 644) gives an excellent idea of these minute and much-dreaded pests of gardens and glass-houses. *See also* **Tetranychus telarius,** Vol. III.

Ventral View.

FIG. 644. RED SPIDER (magnified 130 diameters).

RED-FOOTED BEETLE (*Luperus rufipes*). Both Apple-trees and Pear-trees at times suffer from the attacks of this small, unattractive-looking beetle (Fig. 645), which appears on the newly-opened leaves. It is about 4mm. to 5mm. in length, and of a shining black except the feet, which, as the specific name indicates, are red. There is little difficulty in recognising its presence, for the leaves on which it has been feeding are pierced with innumerable small holes, looking as if they had been penetrated by fine shot. On their first appearance in spring numbers of the pests may be found upon a single leaf, and as they continue in the perfect state a long time, they must be regarded as decidedly inimical to the trees on which they elect to dwell. Old and young trees alike suffer from their depredations, though for the latter they seem to have the greater partiality. Contrary to the custom of many beetles feeding upon fruit trees, the female of the one under notice deposits her eggs in the soil beneath the food-plants. As the presence of the depredator is so easily detected there ought not to be much difficulty in dislodging it by shaking the trees in early spring over a white cloth or by spraying them with an insecticide, Paris Green for instance; while soot or lime "pointed" into the soil in autumn and again early in the new year would probably be of some service.

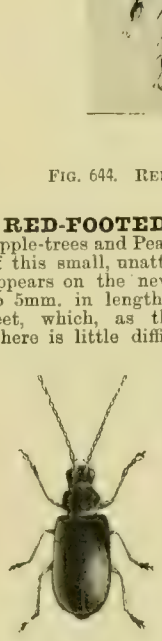


FIG. 645. RED-FOOTED BEETLE.

RED-LEGGED GARDEN WEEVIL. *See* **Apricot Weevil.**

REHMANNIA. To the species described on p. 282, Vol. III., the following should be added:

R. chinensis (Chinese). The correct name of *R. glutinosa.*

R. rupestris (rock-loving). *fl.* white, tinged with rose, tubular. July. *l.* ovate, fleshy, toothed, covered with long silky hairs. Central stem erect; lateral ones all drooping. *h.* 1ft. to 1½ft. Western China, 1890. An interesting, half-hardy species. (B. M. 7191.)

REICHARDIA (of Roth, 1787). A synonym of **Picridium** (which *see*).

REICHARDIA (of Roth, 1821). A synonym of **Pterolobium** (which *see*).

REMIJIA (named in honour of Dr. Remijo, who, according to Auguste de Saint-Hilaire, was the first to make known in Brazil the valuable febrifugal property of the bark of these plants). SYN. *Macrocnemum*. ORD. *Rubiaceæ*. A genus embracing about thirteen species of stove shrubs or small trees, allied to *Cinchona*, natives of tropical America. Flowers white or pink, scented, pubescent, silky, or villous, in axillary, interrupted, often long-pedunculate racemes; stamens five, inserted below the middle of the tube. Leaves opposite or ternately whorled, sometimes large and very coriaceous; stipules intrapetiolar, often large. Only one species has been introduced. *R. pedunculata* requires a warm, moist atmosphere. It should be planted in fresh, spongy, Heath soil coarsely broken up, and this should be kept moist by frequent waterings. According to the "Revue Horticole," however, it might grow stouter and more branching if kept in a temperate house near the glass. It may be propagated as recommended for **Cinchona** (which *see*).

R. pedunculata (long-pedunculate). *fl.* pink; peduncles as long as the leaves. *l.* opposite, shortly petiolate, about 6in. long, ovate, acute, strongly nerved. Andes of Colombia, 1837. Shrub. (Gn., April 13, 1839, p. 343; R. H. 1837, f. 84.)

REMOTE. Separated by unusually large intervals.

RENANTHERA. With the exception of *Renanthera Lowii*, the members of this genus require to be grown in a strong light to induce them to flower in a satisfactory manner. Exposure to the full power of the sun's rays, with a hot, humid condition of the atmosphere, are essential during the active season of growth, with cooler and drier treatment during the resting season. The most free-flowering of these, and one of the most handsome, is *R. Storeii*. *R. Imschootiana* is a small plant, and is most suited for basket culture. Renantheras require ample drainage, and a potting compost consisting of good living sphagnum pressed moderately firm.

To the species described on p. 233, Vol. III., the following should be added. One or two species are transferred to **Arachnanthe.**

R. Imschootiana (Imschoot's).* *fl.* reddish-vermilion and yellow, simply racemose, somewhat resembling those of *R. coccinea*, but having shorter perianth segments. Assam, 1892. There is a variety *superba*. 1899.

R. matutina breviflora is synonymous with *R. elongata*.

R. Rohaniana (Prince Camille de Rohan's). *fl.* yellow and crimson; peduncle black-hispid, flexuous, slender. Borneo, 1891. (W. O. A., t. 435.) According to the Kew authorities, this is a form of *R. Hookeriana*.

RENDLE'S TANK SYSTEM OF HEATING. The system advocated by Wm. Rendle was fixing a large tank in the centre of a house heated by hot-water pipes from the boiler passing to the tank to heat the water. The tank was covered to prevent excessive escape of steam, and tan was used around the tank to plunge plants in. For heating purposes the plan had little to recommend it, and never became popular; but probably it gave the idea of having hot-water tanks in propagating houses. These are usually shallow, cemented tanks, with flow and return hot-water pipes through them to heat the water, which is covered with slabs. On the slabs cocoanut fibre is placed, and pots or pans filled with compost. Cuttings or seeds plunged in this material quickly germinate or root through the genial bottom-heat thus afforded.

RESERVE GARDEN. In almost all gardens it is advisable to have a portion set apart for growing on or nursing trees and hardy plants for future use. Such plants are extremely useful for filling up gaps, adding to existing collections, and, in the case of forcing plants, for lifting and potting as required for bringing on under glass.

REST. *See* **Resting.**

RESTREPIA. The various members of the *Restrepia* family are best grown in shallow pans or baskets so that they may be suspended near the roof-glass of the cool Orchid-house. They require a similar potting compost to that advised for Masdevallias.

Restrepia—*continued.*

To the species described on p. 284, Vol. III., the following should be added:

R. guttulata (slightly striped). This is very like *R. maculata*, but larger in all its parts and destitute of tendrils at the base of the lip. Ecuador.

R. maculata is the correct name of *R. antennifera*.

R. ophiocephala (snake's-head). *fl.* whitish-pink, solitary, nearly 1in. across, shortly gibbous at base; dorsal sepals large, tongue-shaped, scurfy-puberulous; petals scarlet-striated; lip straight, entire. *l.* fleshy, coriaceous, ovate-lanceolate, shortly three-toothed at apex. Mexico. SYN. *Pleurothallis ophiocephala*.

R. pandurata (fiddle-shaped). *fl.* several produced in succession; lateral sepals whitish, spotted crimson-purple; lip pandurate, the anterior blade very broad, transversely oblong, covered with warts, hairy, whitish, with numerous port-wine-coloured spots; column having two orange spots at the base. September. *l.* 2½in. to 4in. long. Stems 1in. to 2in. high. Colombia, 1884.

R. punctulata (slightly dotted). A garden synonym of *R. elegans*.

R. sanguinea (blood-coloured). *fl.* crimson; peduncle 2in. long. *l.* elliptic, 2in. long. Otherwise like *R. pandurata*. Colombia, 1896.

R. striata (striated). This differs from other species of the genus in having striped instead of spotted sepals; they are united for more than half their length. Otherwise it is not unlike *R. elegans*. Colombia, 1891. (B. M. 7233.)

RETARDING. With the aid of specially constructed Retarding chambers, such as those made for Messrs. Rochford, Turnford, Herts, flowers of Lilies, Spiræas, *Azalea mollis*, &c., are produced all the year round. The retarded plants, crowns, or bulbs are brought out of the cool chambers into heat, and the results achieved are highly satisfactory. The gardener, not having such convenience for Retarding, is obliged to purchase such crowns, &c., from nurserymen or other specialists. At the same time much may be done to retard various subjects under his charge, and thus prolong the ordinary season of production. By disposing flowering plants in different parts of the garden in varying aspects, the season of beauty may be extended. Gooseberries and Currants planted behind a north wall and kept dry overhead will furnish fruit until November. In fact, the skilful gardener, with the necessary means at his command, accomplishes much in Retarding and prolonging supplies of fruit, flowers, and vegetables.

RETTBERGIA. A synonym of **Chusquea** (which *see*).

RHAMNUS. To the species described on p. 286, Vol. III., the following should be added:

R. Alaternus aurea (golden). *l.* larger than in *R. A. variegata*, speckled with yellow.

R. alnifolia (Alder-leaved). *fl.* green, solitary or aggregated, produced on the lower part of the young shoots. May and June. *fr.* black, three-seeded. *l.* ovate, acuminate, serrated, 1in. to 3in. long, acute at base, pubescent on the veins beneath. *h.* 2ft. to 4ft. North America, 1778.

R. hybrida (hybrid). *fl.* axillary, always sterile. *l.* oblong, acuminate, finely denticulate, persistent till the second winter. Supposed to be a hybrid between *R. Alaternus* and *R. alpina*. SYN. *R. sempervirens* (of gardens).

R. Pursh iana (Pursh's). *fl.* green; umbels axillary; peduncles longer than the petioles. May. *fr.* black, the size of Peas. *l.* broadly elliptic, denticulate-serrated, 3in. to 5in. long, strongly pubescent beneath. *h.* 10ft. to 20ft. North America, 1826.

R. sempervirens (evergreen). A garden synonym of *R. hybrida*.

RHAPHIDOPHYLLUM. A misspelling of **Rhapidophyllum** (which *see*).

RHAPHIODON. A synonym of **Hyptis** (which *see*).

RHAPHIOLEPIS [*Raphiolepis* is the correct spelling]. To the species described on p. 287, Vol. III., the following should be added:

R. ovata (ovate).* Japanese Hawthorn. *fl.* pinkish-white, disposed in compact umbels. Spring. *l.* ample, rounded, dark green, forming rosettes at the tips of the branches. Japan, about 1870. A beautiful shrub. (R. H. 1870-71, p. 343.) There is a form with variegated leaves.

RHAPIS. *R. Kwanwortsik* (misspelled Kwamwonzick in I. H. 1887, t. 13) is a synonym of *R. flabelliformis*.

RHAZYA (from the Arabic name). ORD. *Apocynaceæ*. A small genus (two species) of hardy, glabrous, erect shrubs or under-shrubs, closely allied to *Vinca*, natives of Greece, Western Asia, and Arabia. Flowers densely cymose, corymbose, or somewhat thyrsoid at the tips of the branches. Leaves alternate, rather thick. One species has been introduced. It requires similar treatment to the hardy species of **Vinca** (which *see*).

R. orientalis (Oriental). *fl.* varying from bright blue to dark violet; corolla seven lines long; cyme terminal, not exserted from the uppermost leaves. Summer. *l.* 2in. long, membranous, shining, ovate-lanceolate, acuminate, sub-sessile. Branches simple, short, erect, thickly leafy. Orient, 1839. (R. G. 1891. t. 1346.)

RHEUM. To the species described on p. 288, Vol. III., the following should be added:

R. australe is regarded by Sir J. D. Hooker as probably synonymous with *R. Emodi*.

R. Collinianum (Collin's). *fl.* crimson, in spikes 5ft. to 6ft. high. June and July. China.

R. compactum (compact). *fl.* white and green; panicle branches nodding (erect in fruit). May. *l.* broadly ovate, rather thick, obsoletely undulated or flat, seven-nerved, very obtuse, highly glabrous above, slightly pilose beneath. Stems tall, sulcate. Siberia, &c., 1758. SYN. *R. nutans*.

R. hybridum Florentini (Florentin's hybrid). A garden hybrid between *R. Collinianum* and *R. officinale*. It has an inflorescence 6ft. to 9ft. high, the flowers being excessively numerous. 1899.

R. Moorcroftianum (Moorcroft's).* *fl.* bright red, disposed in a dense, pyramidal inflorescence less than 2ft. high; racemes pubescent. *l.* oblique, nearly glabrous. Kumaon, 1885. A very decorative, probably hardy species. (G. C. 1895, xvii., p. 765, f. 115.)

R. nutans (nodding). A synonym of *R. compactum*.

R. palmatum tanghuticum.* This differs from the type in having much longer and more deeply-lobed leaves. It makes an excellent lawn plant.

R. Ribes (Ribes-like). *fl.* white and green; pedicels fascicled. May. *l.* glaucescent, coriaceous, sub-cordate-orbicular or reniform, 4in. to 12in. long, 6in. to 2ft. broad, minutely denticulate, often papillose-scabrid beneath. Stems tall, thick, leafy below, leafless above and forming a large, much-branched, fastigiate panicle. Orient, 1724. This is unfortunately not hardy. (B. M. 7591.)

RHEXIA. Several species formerly included hereunder are now referred to *Tibouchina*. *R. Acisanthera* is synonymous with **Acisanthera quadrata** (which *see*).

RHINACTINA. A synonym of **Jungia** (which *see*).

RHINCHOGLOSSUM. *See* **Rhynchoglossum.**

RHIPSALIS. Mistletoe Cactus. To the species and varieties described on p. 290, Vol. III., the following should be added. Several others have lately been introduced, but are chiefly of botanical interest, the flowers being mostly small and unattractive. Sixteen new species and varieties were described in the "Revue Horticole" in 1892, but they do not appear to be in general cultivation. Some of them, however, are listed by German specialists in Cactaceous plants. Rhipsalis species succeed best when grown in a moist stove.

R. aculeata (prickly). *fl.* whitish, small. *fr.* dark wine-red. Stems cylindrical, trailing, slightly eight- to ten-angled, and clothed with tufts of slender white spines. Argentina, 1892

R. cavernosa (cavernous). This is something in the way of *R. communis*, but has flat (not three-angled), toothed stems, the axils of the teeth having a large cavity filled with woolly hairs. South Brazil, &c., 1890. There are also white and pink varieties of this. SYN. *Lepismium cavernosum* (R. G. 1890, p. 151, f. 38).

R. cristatum purpureum (purple). A variety with larger, broader joints, bronzy-purple in colour.

R. dissimilis (unlike). Stems stout, cylindrical, jointed, some of them smooth, while others are covered with tufts of bristles about ¼in. long. South Brazil, 1890. SYN. *Lepismium dissimile* (R. G. 1890, p. 148, f. 36-7; 1891, p. 634, f. 21). The form *setulosa* has five-angled stems.

R. floccosa (woolly). Stems as in *R. Cassytha* (of which this is probably a variety), but thicker, longer, and with the branchlets in compact clusters on the ends of the long, arching branches. Warm-house.

R. hadrosoma (thick-bodied). *fl.* white, hyaline. Stems cylindrical, bright green. Brazil, 1897.

R. Knightii (Knight's). *fl.* white, small. Stems and joints as in *R. communis*; wings of joints usually broad, with red margins, the hair in the notches in a dense tuft nearly 1in. long, pure white, silk-like. *h.* 1ft. Brazil. A straggling species. SYNS. *Cereus Knightii, Lepismium Knightii*.

Rhipsalis—*continued*.

R. Mittleri (Mittler's). The correct name of *R. communis*.

R. Myosurus (mouse-tail).* *fl.* yellow, tinged with red, small, borne from the notches. July. Stems dependent, several feet long, branching freely, jointed, with three or four wings or angles; angles reddish, notched, with tufts of white hairs between the notches. Brazil, 1839. Warm-house. SYN. *Lepismium Myosurus*.

R. penduliflora laxa (loose). A variety having branches curving and more pendulous than in the type.

R. pulvinigera (cushion-bearing). *fl.* white and yellowish green. Branches dark green, terete, having the areolæ in regular spirals, and bearing small, rounded, rudimentary leaves or scales of a reddish-brown. Brazil, 1839. Similar to *R. floccosa*. (R. G. 1839, p. 182, f. 33, 34.)

R. Regnelli (Regnell's). *fl.* white, small. Branches broad, flat, coarsely toothed. South Brazil, 1890. Similar to *R. Houlletii*. (R. G. 1890, p. 118, f. 29, 31-3.)

R. salicornoides stricta (erect). Joints all pointing upwards. Plant much more compact than the type.

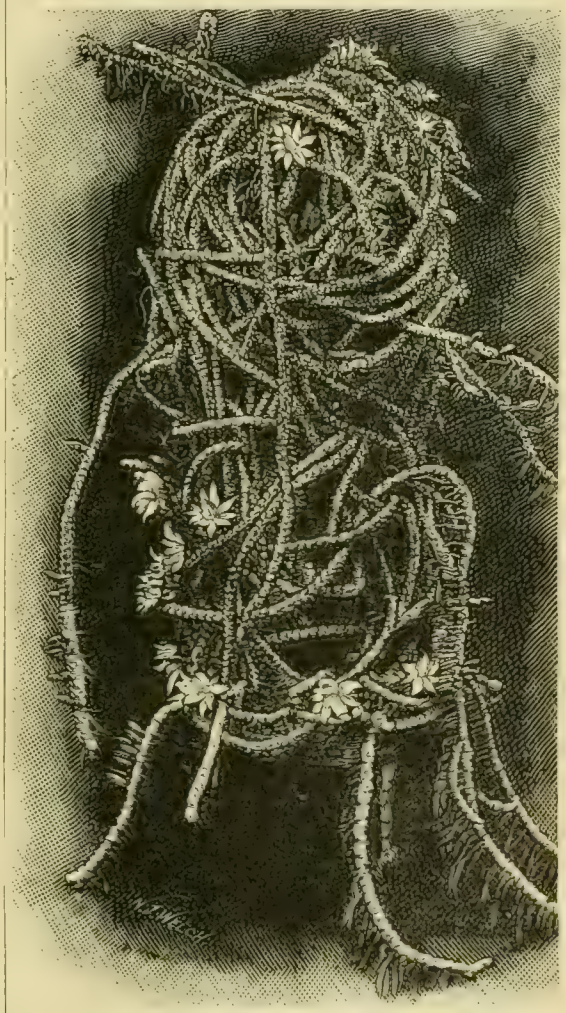


FIG. 646. RHIPSALIS SARMENTACEA.

R. sarmentacea. This species (described in Vol. III.) should be grown in a basket of peat-fibre, or, better still, on a piece of soft Fern-stem. See Fig. 646, for which we are indebted to the *Gardeners' Chronicle*.

R. trigona (three-angled). *fl.* white, small, borne in the notches of the angles. Spring. *fr.* white. Branches usually in forks, ¼in. in diameter, three-angled; angles wavy or slightly notched, greyish-green. Brazil. A thin, straggling, stove species.

RHIZOGLYPHUS ECHINOPUS. The scientific name of the well-known "Bulb Mite," so difficult to deal with on account of its mode of feeding. *See* under **Galanthus.**

RHIZOMORPHA FRAGILIS. *See* **Vine Fungi,** Vol. IV.

RHIZOMORPHA SUBCORTICALIS. *See* **Vine Fungi,** Vol. IV.

RHIZOPUS NECANS. *See* **Lilium—Pests.**

RHODDON-TREE. *See* **Pyrus Aucuparia.**

RHODODENDRON. Including *Vireya*. **Rhodora** (which *see*) is also included hereunder by modern authorities. To the species and varieties described on pp. 292-8, Vol. III., the following should be added. One or two of them belong to the section **Azalea** (which *see*), as indicated by the synonyms. In the enumeration given are many of the finer hybrids and varieties of garden origin. Others will be found at the end.

R. afghanicum (Afghan). A synonym of *R. Collettianum.*

R. albescens (whitish). *fl.* white, scented, large, the upper segments marked at the base with sulphur-yellow. *l.* glabrous, the under-surface silvery-white. 1887. Garden hybrid.

R. Albrechtii (Albrecht's). *fl.* purple, smaller than in *R. Schlippenbachii* (to which this species is allied); corolla rotate-campanulate, with a very short tube. *l.* smaller and slenderer, deciduous, broadly elliptic or oblong. Branches slender, flexuous. Japan. Probably hardy.

R. Andersoni (Anderson's). *fl.* bright carmine. Himalayas. A garden name for what is probably a form of *R. arboreum.*

R. Apoanum (Apo). *fl.* red, small, tubular, about ½in. long, with spreading lobes; trusses few-flowered. *l.* narrowly elliptic, acute at both ends, green above, rusty beneath. Philippine Islands, 1885. A small shrub. (R. G., t. 1196 [1195 in text].)

R. arboreum. *R. nilagiricum* and *R. Windsori* are forms of this species.

R. assamicum (Assam). A garden name of *R. formosum.*

R. Aucklandii. The correct name is *R. Griffithianum.*

R. Batemani (Bateman's). A form of *R. campanulatum.*

R. blandfordiæflorum is identical with *R. cinnabarinum.*

R. brachycarpum (short-fruited). *fl.* pale yellow or cream-colour, dotted with green at the base of the upper lobes of the corolla, 1½in. to 1¾in. in diameter, disposed in large, terminal clusters. *l.* oblong, obtuse, shortly mucronate, clothed beneath with rusty-silky pubescence. Japan, 1833. A tall, hardy, wide-branching shrub, resembling *R. catawbiense* in general appearance. (G. & F. 1883, p. 292, f. 46.)

R. calophyllum is a variety of *R. Maddeni.*

R. Campbelliæ (Lady Campbell's). A synonym of *R. arboreum.*

R. catawbiense. Of this very hardy species there are a number of varieties, principally of garden origin. The best are: *album elegans*, white, with yellow spots; *delicatissimum*, blush-rose; *Everestianum*, lilac, daintily spotted; *fastuosum flore-pleno*, lilac, a fine double; and *purpureum elegans*, rich purple.

R. ciliicalyx (having a ciliated calyx). *fl.* pure white when fully expanded, 2½in. long, 4in. in diameter, odorous; calyx segments rounded, edged with white ciliæ; corolla tube short, the lobes crisped. *l.* obovate-lanceolate, coriaceous, 3in. to 4in. long, shining green above, brownish-scaly beneath. Yunnan, 1895. A remarkable species, allied to *R. Veitchianum.*

R. Collettianum (Major Collett's).* *fl.* white, in dense, terminal corymbs, shortly pedicellate, surrounded with broad, ciliated scales; sepals five, obtuse; corolla nearly 1in. long, funnel-shaped; stamens ten. May. *l.* 2in. to 3in. long, very coriaceous, elliptic-oblong or -lanceolate, acute at both ends, opaque above, lepidote-scaly beneath; petioles ¼in. to ½in. long. Branchlets furfuraceous-pubescent. *h.* 8ft. to 10ft. Afghanistan. Hardy. (B. M. 7019; G. C. 1883, iv., p. 297.) SYN. *R. afghanicum* (of gardens).

R. Curtisii (Curtis'). A synonym of *R. multicolor.*

R. dilatatum (dilated).* *fl.* twin; corolla bright rose-colour, fading to white towards the base within, deeply two-lipped; inflorescence terminal, clothed with glabrous bracts. April. *l.* ternate, 1½in. to 2in. long, rhombic-ovate, bright green clouded with blood-red above, very pale beneath. Japan, 1885. A small, beautiful, hardy, much-branched shrub. (B. M. 7681.) SYN. *Azalea dilatata* (of gardens).

R. Falconeri-niveum (hybrid). A garden hybrid between the two species indicated in the name. 1896.

R. ferrugineum. Of this species *atrococcineum* (dark scarlet), *erectum* (erect), *hybridum* (hybrid), *myrtifolium* (Myrtle-leaved), and *variegatum* (variegated) are desirable varieties.

R. flavum (yellow). *See* **Azalea pontica.**

R. Fordii (Ford's).* *fl.* white, about 2in. in diameter, disposed in few-flowered corymbs. *l.* dark green, obovate, cuneate at base, coriaceous, 3in. long. China, 1894. Allied to *R. Fortunei* and *R. brachycarpum.*

R. formosum. *R. Gibsonii* and *R. Johnstoni* are merely forms of this species.

R. Forsterianum (Forster's). A garden hybrid between *R. Veitchianum* and *R. Edgeworthii.* 1832.

R. Gibsonii (Gibson's). A form of *R. formosum.*

R. grande roseum (rosy).* *fl.* of a lively rose-colour, with darker veins on the lobes, and obscure spots on the tube within. Sikkim, 1887. (B. M. 6948.)

R. graveolens (strongly-scented).* *fl.* pure white, fragrant. A dwarf and free-flowering hybrid between *R. formosum* and *R. Sesterianum.*

R. Griffithianum is the correct name of *R. Aucklandii* (R. G. 1856, t. 517; R. H. 1855, t. 5).

R. Halopeanum (Halopé's). A garden hybrid between *R. Griffithianum* and *R. arboreum.* 1896. (R. H. 1896, pp. 359, 423.)

R. Harrisii (Harris's).* *fl.* deep rose-crimson, with a few dark spots on the upper segments, in a dense head as in *R. arboreum.* Autumn. *l.* oblong-ovate, 5in. long, pale beneath; petioles 1in. long. A hybrid between *R. arboreum* and *R. Thomsonii.* Hardy.

R. hirsutum album (white). A white-flowered form, of compact habit.

R. indico-javanicum (hybrid). A garden hybrid between *Azalea indica* and *R. javanicum.* 1839.

R. intermedium (intermediate). A natural hybrid between *R. ferrugineum* and *R. hirsutum.*

R. irroratum (bedewed). *fl.* many, in terminal heads, very shortly pedicellate; corolla 1¼in. long, the tube white, with faint spots, the five short, recurved lobes suffused with rose. September. *l.* spreading and deflexed, 3in. to 4in. long, oblong to oblanceolate, with recurved margins. *h.* 3ft. or more. China, 1890. A glabrous shrub. (B. M. 7361.)

R. jasminiflorum carminatum (carmine). *fl.* rich carmine, slightly toned with orange-scarlet around the base of the limb, the tube paler externally. 1886. A hybrid between *R. jasminiflorum* and *R. javanicum.*

R. j. roseum (rosy). *fl.* soft carmine-rose, twice as many in an umbel as in the type. 1894.

R. javanicum tubiflorum (tube-flowered). *fl.* orange-red; corolla tube elongated. June. *l.* smaller than in the type, the midrib impressed above. Sumatra and Java, 1835. (B. M. 6850.)

R. Johnstoni (Johnston's). A form of *R. formosum.*

R. Keiskei (Keiske's). *fl.* rose-purple, about 1in. in diameter, disposed in loose corymbs. *l.* ovate, 3in. long. Japan, 1895. A hardy species, allied to *R. dauricum*, but dwarfer in habit.

FIG. 647. RHODODENDRON KEWENSE.

R. kewense (Kew).* *fl.* of a pale flesh-colour, not so large as those of *R. Griffithianum* (between which and *R. Hookeri* this is a hybrid), but more numerous in the truss. Kew, 1874. A valuable and quite hardy plant, flowering freely near towns. See Fig. 647.

R. Kingianum (King's). *fl.* blood-red, disposed in a dense head. Manipur, 1899. A new species, closely allied to *M. arboreum*, from which it differs in having the leaves crowded on the stems, bullate, with recurved margins. (G. C. 1899, xxvi., p. 306, f. 102.)

R. Kochii (Koch's). *fl.* white, 1¾in. long, tubular, with a campanulate limb, something like those of *R. jasminiflorum*, disposed in loose trusses. *l.* petiolate, oblong-lanceolate,

Rhododendron—*continued.*

acuminate, 5in. to 6in. long, narrowed to the petioles, which are ½in. to 1½in. long. Philippine Islands, 1885. Stove shrub. (R. G., t. 1195 [1196 in text].)

R. Lindleyi (Lindley's).* *fl.* pure white, five or six in a terminal umbel, stout, wax-like, with an aromatic perfume; corolla tube 2½in. long, the limb 3in. broad. April. *l.* 3½in. long, elliptic-oblong, retuse-mucronate, slightly revolute, glaucous and dotted beneath. Bhotan, 1864.

R. Lobbii (Lobb's). *fl.* bright glossy crimson, with a long, narrow, curved tube, and a small, spreading limb, disposed in terminal trusses. *l.* oblong-elliptic, disposed in whorls. Borneo, 1870.

R. Lochæ (Lady Loch's). *fl.* rather large, in terminal, umbelliform fascicles, on very conspicuous stalklets; corolla bright red, scaly-dotted outside, the tube cylindrical, the limb bluntly five-lobed and conspicuously veined. *l.* persistent, mostly whorled, some scattered, conspicuously stalked, flat, nearly ovate, rather blunt, glabrous, minutely scaly-dotted beneath. *h.* 20ft. Mount Bellenden-Ker, 1887. This tree is the only known Australian Rhododendron.

R. Luscombei (Luscombe's). *fl.* rosy-red, broadly campanulate, as large as those of *R. Fortunei*. A garden hybrid between *R. Fortunei* and *R. Thomsonii*. 1892. There is a variety *splendens* with rich crimson flowers. 1896.

R. macrosepalum (large-sepaled). *fl.* pink, the upper corolla lobes spotted with purple; sepals very long, acuminate. *l.*, young ones elliptic-lanceolate, shortly acuminate, aggregated at the tips of the branchlets; the rest obversely lanceolate, slightly acute, smaller. Japan, 1870. A very dwarf, hardy species.

R. Maddeni longiflorum (long-flowered). *fl.* borne on longer and thicker pedicels than in the type; corolla dull rose outside, pale bluish inside, 5in. long. 1894.

R. Manglesii (Mangles').* *fl.* white, disposed in very large heads. 1886. *R. Griffithianum* is one of the parents and a garden hybrid (ALBUM ELEGANS) the other. Vigorous and quite hardy.

R. modestum (modest). *fl.* six to ten, loosely umbellate; corolla pale pink, with blood-red spots on the dorsal half of the tube, broadly funnel-shaped. May. *l.* rather crowded, shortly petiolate, 2in. to 3in. long, elliptic-oblong, acute, greenish-yellow beneath, closely lepidote. Sikkim Himalaya, 1887. A small, much-branched shrub. (B. M. 7686.)

R. multicolor (many-coloured). *fl.* few, horizontal, in terminal umbels; calyx minute; corolla dark red or bright yellow, 1in. long, between funnel- and bell-shaped, the five lobes equal, one-third the length of the tube. Winter. *l.* whorled, three to seven together, 2in. to 3in. long, ½in. to ¾in. broad, elliptic-lanceolate, narrowed at both ends, contracted into the short petioles, dull green above, paler beneath. Sumatra. A small, glabrous, slender bush. (B. M. 6769.) SYN. *R. Curtisii* (F. & P. 1884, 615).

R. nobilius (noble). A garden hybrid between *R. Teysmanni* and *R. javanicum*. 1896.

R. occidentale (Western).* Californian Azalea. *fl.* later than the leaves, umbellate, odorous; corolla white, or with a slight rosy tinge and a pale yellow band on the upper lobe, often 2½in. long, with a conspicuous funnel-shaped tube. *l.* obovate-oblong, nearly glabrous at maturity, but ciliated, thickish, 1in. to 3in. long, shining green, changing to blood-red in autumn. *h.* 2ft. to 6ft. North America. Hardy. SYN. *Azalea occidentalis*.

R. orbiculare (orbicular). *fl.* rosy, fascicled; corolla lobes six or seven, roundish; pedicels highly glabrous. *l.* orbicular-cordate, with short, imbricated lobes, whitish beneath; petioles fleshy. *h.* 9ft. Thibet, 1877.

R. ovatum (ovate). *fl.* rosy-purple, with spots of a darker purple. Spring. *l.* ovate, shining, 1½in. long. North China. A dwarf species, first introduced by Fortune in 1844, but afterwards lost to cultivation; it was reintroduced in 1895. SYN. *Azalea ovata* (B. M. 5064).

R. parvifolium. According to the "Index Kewensis," this is synonymous with *R. Anthopogon*.

R. ponticum must not be confused with **Azalea pontica** (which *see*). There are several varieties: *album*, *cheiranthifolium*, *daphnoides* (of gardens), *lancifolium*, and *variegatum*.

R. præcox (early).* *fl.* delicate rose, profusely produced in the middle of February in mild seasons. A garden hybrid between *R. ciliatum* and *R. dauricum*. 1882.

R. procerum (tall). A synonym of *R. maximum*.

R. Przewalskii (Przewalski's). *fl.* white; corolla campanulate, with rounded, emarginate lobes; raceme corymbose, erect, twelve- to fifteen-flowered. *l.* coriaceous, smooth, ovate-elliptic, rounded at base. Kansu, China, 1899. A compact-growing, hardy, evergreen species.

R. purpureum (purple). A synonym of *R. maximum*.

R. Purshii (Pursh's). A synonym of *R. maximum*.

R. racemosum (racemose). *fl.* pink and white, campanulate, nearly 1in. across, very sweet-scented, disposed in sub-terminal corymbs; corolla lobes spreading, obtuse. March. *l.* deep green above, nearly white beneath, shortly petiolate, elliptic or obovate, obtuse, rounded or cuneate at base. Western China, 1892. A small, erect, Box-like, hardy shrub, very useful for the rock-garden. (B. M. 7301; G. C. 1892, xii., p. 62, f. 9; Gn. 1892, xlii., t. 878.)

R. Rhodora. The correct name of *Rhodora canadensis*.

R. Rollissonii is a variety of *R. arborcum*.

R. roseum odoratum (rosy, scented). *fl.* pale rose-coloured, fragrant, rather small, disposed in good-sized heads. 1886. Garden hybrid.

R. Roylei (Royle's). A synonym of *R. cinnabarinum*.

R. rubiginosum (reddish). *fl.* few, corymbose, shortly pedicellate, much larger than in *R. punctatum* (which this species otherwise much resembles); corolla bright rose-red. April and May. *l.* ovate or oblong-lanceolate, acute or acuminate. *h.* 3ft. Yunnan, 1894. Plant (leaves beneath) brownish-lepidote-scaly; quite hardy. (B. M. 7621.)

R. scabrifolium (rough-leaved). *fl.* in loose, terminal, sub-umbellate fascicles; corolla white, flushed with pink, 1½in. in diameter, the lobes spreading, about twice as long as the tube. April. *l.* 2½in. to 3½in. long, elliptic- or oblong-lanceolate, acute at both ends, scabridly hispid above, scaly beneath, ciliate-margined. Stems, &c., hispid-hairy. Western China (at 8000ft.), 1883. A small, rigid, unbranched shrub. (B. M. 7159.)

R. Schlippenbachii (Baron Schlippenbach's).* *fl.* produced before the leaves, umbellate; corolla pale rose, 3in. across, the tube very slight, the lobes broadly ovate, speckled with reddish-brown towards the base. *l.* deciduous, sub-quinately whorled, sessile, thin, 2in. to 4in. long, obovate, very shortly petiolate. *h.* 3ft. to 5ft. Manchuria and Japan. Related to *R. sinensis*. A handsome species. (B. M. 7373; G. C. 1894, i., p. 462, f. 58; Gn. 1894, xlvi., t. 972.) SYN. *Azalea sinensis*.

R. serpyllifolium (Wild-Thyme-leaved). *fl.* solitary, sub-sessile, from leafless buds at the ends of the leafy branchlets; corolla bright rose-red, about 1in. broad, with spreading lobes. April. *l.* deciduous, crowded, rarely over ¼in. long, sessile, appearing as if whorled on the very short lateral branchlets. Japan, 1882. A low, scrubby, rigid, possibly hardy shrub. (B. M. 7503.) SYN. *Azalea serpyllifolia*.

R. Sesterianum (Sester's). A white-flowered, garden hybrid, of which *R. Edgeworthii* is one of the parents.

R. Smirnowi (Smirnow's).* *fl.* deep purplish-scarlet, corymbose-umbellate; calyx minute, pelviform, the lobes very short; corolla campanulate, about 1¼in. long, obtusely five-lobed, crimped on the margins. *l.* 4½in. long, coriaceous, evergreen, oblong, rather obtuse at apex, cuneate at base, the margins revolute, glabrous above, beneath (as well as on the petioles, peduncles, and pedicels) densely white-floccose-tomentose. Caucasus, 1886. A tall shrub. (R. G., t. 1226, f. 2, d-g.)

R. superbissimum (most superb).* A garden hybrid, probably between *R. Veitchii* and *R. Edgeworthii*. 1897.

R. Teysmanni (Teysmann's). *fl.* many, in terminal umbels; corolla yellow, 1⅜in. long and broad, the tube cylindric below, widely funnel-shaped upwards. *l.* oblong-lanceolate, acute, often whorled, 7in. long; petioles ¼in. long. India. A large, stove shrub.

R. Ungerni (Baron Ungern-Sternberg's). *fl.* white, corymbose-umbellate; calyx small, five-parted, the segments elongated; corolla campanulate, obtusely five-lobed, the lobes reddish on the back. *l.* coriaceous, persistent, oblong, nearly 7in. long, narrowed towards the base, cuspidate at apex, glabrous above, white-floccose-tomentose beneath; petioles (as well as the branches) tomentose-puberulous. Caucasus, 1886. A tall shrub. (R. G., t. 1227, f. 1, a-c.)

R. Vaseyi (Vasey's).* *fl.* in lax umbels; corolla bright clear pink, 1⅜in. across, dotted with darker pink at the base of the upper lobes. May. *l.* oblanceolate, acute, cuneate at base, 2½in. to 3in. long, not expanded at flowering time, sparsely hairy. Carolina, 1888. Although this hardy shrub attains 15ft. to 18ft., yet it flowers when only about 1ft. in height (G. & F. 1888, i., f. 60.)

R. Victorianum (Victorian). *fl.* pure white, except the golden-yellow interior of the funnel-shaped tube, as freely produced as those of *R. Dalhousiæ*; limb spreading, five-lobed. *l.* as in *R. Nuttallii*. 1887. A garden hybrid between the species named.

R. Washingtonianum (Washington's). This is merely a form of *R. californicum*. 1899.

R. Williamsii (Williams'). *fl.* white, slightly spotted in the upper segments, freely produced. 1895. A hybrid between a species of *Rhododendron* and *Azalea sinensis*.

R. Windsori is a variety of *R. arboreum*.

R. yedoënse (Yeddo). *fl.* pale blush-coloured, double, about three in an umbel; calyx segments linear-oblong, acute, slightly serrated, white-bristly; corolla tube funnel-shaped, the limb campanulate. *l.* sub-caducous, oblong-lanceolate, shortly acuminate, spreading, in groups of about five at the tips of the branchlets, membranous-chartaceous, the autumnal ones smaller, linear-spathulate. Japan, 1886. (R. G., t. 1233 a-b.)

Rhododendron—*continued.*

R. yunnanense (Yunnan). *fl.* few, sub-racemosely corymbose on a stout, terminal rachis; corolla white, 2in. across, with blood-red spots towards the bases of the upper lobes. April. *l.* shortly petiolate, 2½in. to 3in. long, elliptic-lanceolate, covered above with stiff hairs, pale green and glabrous beneath. Branches blackish-brown. Yunnan, 1894. An erect, hardy shrub. (B. M. 7614.)

The following are rare in cultivation: *R. decorum*, *R. Delavayi*, *R. lacteum*, *R. linearifolium*.

FIG. 648. RHODODENDRON OPHELIA.

Varieties. The following are some of the best:

Hybrid Greenhouse Rhododendrons. AMABILE, APHRODITE, BALSAMINÆFLORUM ALBUM, B. AUREUM, B. CARNEUM, B. RAJAH, B. ROSEUM, BARONESS HENRY SCHRODER, CERES, EXQUISITE, HERCULES, LATONA, LITTLE BEAUTY, LUTEO ROSEUM, MRS. HEAL, NE PLUS ULTRA, NEPTUNE, NUMA, OPHELIA (see Fig. 648), PRINCESS BEATRICE, PURITY, ROSE PERFECTION, RUBY, SOUVENIR DE J. H. MANGLES, SYBIL, TRIUMPHANS, YELLOW GEM, YELLOW PERFECTION.

Hardy Rhododendrons (Garden Varieties and Hybrids). A. B. FREEMAN MITFORD, ABRAHAM DIXON, AGAMEMNON, ALTACLARENSE, ANNIE DIXWELL, ARBOREUM WELLSIANUM, AUGUSTE VAN GEERT, BARONESS SCHRODER, BARON OSY, BLANCHE SUPERBE, BRILLIANT, BROUGHTONIANUM, CHARLES THOROLD, C. S. SARGENT, CUNNINGHAMI, DHULEEP SINGH, DONCASTER, DUCHESS OF CONNAUGHT, EARLY GEM, FLORENCE SMITH, GOVENIANUM, HALENSE, HELENE SCHIFFER, HENRIETTA SARGENT, HIRSUTIFORME, JOHN WATERER, KATE WATERER, LADY CLAREMONT, LADY CLEMENTINE MITFORD, LIMBATUM, LORD EVERSLEY, MME. MIOLAN CARVALHO, MADAME WAGNER, MARTIN HOPE SUTTON, MAXWELL T. MASTERS, MIRABILE, MISS JEKYLL, MRS. JOHN WATERER, MRS. R. G. SHAW, MRS. TOM AGNEW, NEILSONII, NOBLEANUM COCCINEUM, OBTUSA, OCHROLEUCUM, PINK PEARL, PRINCE CAMILLE DE ROHAN, PRINCESS WILLIAM OF WURTEMBURG, PROMETHEUS, PULCHERRIMUM, RUSSELLIANUM, SIR HUMPHREY DE TRAFFORD, TORLINIANUM, VESUVIUS.

RHODOSPATHA. Including *Altimeta*. *R. picta* is the correct name of *Spathiphyllum pictum*.

RHODOSTACHYS. To the species described on p. 298, Vol. III., the following should be added:

R. bicolor. *Bromelia bicolor* (B. H. 1873, t. 14) is the same as this species; but *B. Joinvillei* and *Hechtia pitcairniæfolia* are synonyms of *B. pitcairniæfolia*, while *Ruckia Elemeeti* is identical with *R. andina*.

R. Elemeeti (Elemeet's). A synonym of *R. andina*.

R. Joinvillei (Joinville's). A synonym of *R. pitcairniæfolia*.

R. littoralis (seaside-loving). *fl.*, petals rose-red, lingulate, 1in. long; filaments pink; head central, 1½in. to 2in. in diameter. September to November. *l.* about forty in a rosette, ensiform, acuminate, less than 1ft. long, ⅜in. broad, white-lepidote at back, the marginal prickles pungent. Colchagua, Chili, 1873.

R. pitcairniæfolia (Pitcairnia-leaved). *fl.* in a dense, central head 1½in. to 2in. across; petals bright violet, slightly protruded; ovary clavate, 1in. long; reduced inner leaves bright red. *l.* about fifty, ensiform, 1½ft. long, ½in. to ⅝in. broad, gradually tapering. Probably Chili, 1866. The following are identical with this species: *Billbergia Joinvillei*, *Bromelia Joinvillei* (B. H. 1876, p. 161, tt. 10, 11), *Hechtia pitcairniæfolia* (R. H. 1861, p. 211), *R. Joinvillei*.

R. p. Kirchoffiana (Kirchoff's). This differs from the type in being smaller and slenderer, and in having the bracts smooth within. Chili, 1890. (R. G. 1890, p. 345, t. 1325.)

RHOPALOBLASTE (from *rhopalon*, a club, and *blaste*, sprout or embryo; the embryo bears a club-shaped appendage). ORD. *Palmæ*. A small genus (three species) of unarmed, stove Palms, natives of the Malay Archipelago, and closely allied to **Ptychosperma** (which *see* for culture). Spadix shortly pedunculate, loosely branched; complete spathes two, caducous, the lower one shorter, two-keeled.

R. hexandra (six-anthered). *fl.* rather large; spadix thick, pedunculate, robust-branched; spathes large, the lower one densely velvety-tomentose. *fr.* nearly 1in. long. *l.* large, regularly pinnate; leaflets thick, coriaceous, linear, acute. Stem robust. Moluccas, 1890. SYNS. *Bentinckia ceramica*, *Cyrtostachys ceramica*.

R. singaporensis (Singapore). A synonym of *Ptychoraphis singaporensis*.

RHOPALOCERA. *See* **Moths.**

RHOPALOSIPHUM RIBIS. *See* **Aphides.**

RHUBARB, PRICKLY. *See* **Gunnera.**

RHUS. Several species of this genus are amongst the finest subjects for affording autumn tints—*R. Cotinus*, *R. cotinoides*, and *R. typhina* (Fig. 649), which makes an ideal plant for lawns, and thrives even in towns.

To the species, &c., described on pp. 300-1, Vol. III., the following should be added:

FIG. 649. RHUS TYPHINA.

Rhus—*continued.*

R. cotinoides (*R. Cotinus*-like).* *fl.* minute; panicle nearly sessile, narrow, with erect branches. *fr.* smooth. *l.* simple, membranous, oval, obtuse, entire, acute at base, 3in. to 4in. long (including the petioles). Alabama. Hardy.

R. Cotinus atropurpurea (dark purple).* A desirable variety on account of its richly-coloured foliage and purple seed-plumes.

R. Michauxii (Michaux'). *fr.* bright scarlet, clothed with close, silky pubescence, disposed in pyramidal panicles. *l.* pinnate. Stems erect, 2ft. to 3ft. high. Southern United States, 1895. Hardy shrub, spreading extensively by underground stolons. (G. & F. 1895, p. 404, f. 55.)

R. Toxicodendron. Poison Vine. The Japanese forms are known in gardens under the erroneous name of *Ampelopsis Hoggi*. They are to be avoided on account of their poisonous nature.

R. trichocarpa (hairy-fruited). *fl.* inconspicuous; panicles narrow. *fr.* pale, prickly, loosely drooping. *l.* long, unequally pinnate. *h.* 25ft. Japan, 1897. A slender, hardy tree. (G. & F. 1897, p. 384, f. 49.)

RHYNCHANTHERA (of Blume). A synonym of **Corymbis** (which *see*).

FIG. 650. RHYNCHOSTYLIS RETUSA.

RHYNCHANTHUS (from *rhynchos*, a beak, and *anthos*, a flower; in allusion to the peculiar shape of the blossoms). ORD. *Scitamineæ*. A small genus (two species) of very curious, stove, tuberous-rooted herbs, remarkable in having very small corolla lobes, a lip reduced to a mere point, a most curious, petaloid filament, resembling a long canoe, exserted far beyond the corolla lobes, and terminated by an anther with no appendage, and an erect, funnel-shaped stigma. For culture, *see* **Heliconia.**

R. Bluthianus (Bluth's). *fl.* few in a spike; segments carmine-red; filament white, broad. *h.* about 1ft. Birma (?), 1899. A Canna-like plant. (R. G. 1899, p. 33, t. 1464.)

R. longiflorus (long-flowered). *fl.* 4in. long, few, erect, in a terminal, sub-sessile spike; bracts two, pale orange-red, 1½in. long; calyx tubular, with a split mouth, and a rounded, retuse tip; corolla pale yellowish-green, the tube 2in. long, the lobes ¼in. long; filament straw-coloured. July. *l.* 6in. to 8in. long, 1½in. broad, oblong-lanceolate, acuminate, edged brown, contracted into short petioles. Stem 1½ft. high, with ten to twelve leaves. Birma, 1885. (B. M. 6861.)

RHYNCHOCARPA. A synonym of **Kedrostis** (which *see*).

RHYNCHOGLOSSUM. *R. obliquum* is the correct name of *R. zeylanicum.*

RHYNCHOSIA. *R. caribæa* is the correct name of *R. gibba*. *R. albo-nitens* is a synonym of **Desmodium Skinneri albo-nitens** (which *see*).

RHYNCHOSTYLIS. To the species described on p. 302, Vol. III., the following should be added:

R. cœlestis (celestial-blue).* *fl.* crowded, ¾in. across, on white or pale blue pedicels; sepals white, with an indigo-blue apical blotch; basal half of the blade of the lip white, the apical half indigo-blue; column very short. *l.* fleshy, 4in. to 6in. long. Stem stoutish. Siam, 1891. (L., t. 300; W. O. A. viii., t. 361.) SYN. *Saccolabium cœleste.*

R. garwalica (Garwhal). A synonym of *S. retusa.*

R. retusa guttata (striped). *fl.* smaller, more crowded, and more densely spotted. *l.* longer, narrower, more closely set, sub-pendulous. SYN. *Saccolabium guttatum* (B. M. 4108; W. S. O. ii., t. 18). The type is shown at Fig. 650.

R. r. præmorsa (bitten). *fl.* pale, and with fewer spots; racemes longer. *l.* shorter and broader, distinctly præmorse at apex. Plant more robust.

RHYPAROBIA (PANCHLORA) MADERÆ. *See* **Cockroaches.**

RHYTIDOPHYLLUM. *R. Humboldtii* and *R. Oerstedii* are synonymous with *Campanea Humboldtii* and *C. Oerstedii* respectively.

RHYTISMA ACERINUM. *See* **Acer—Insects and Diseases.**

RIBBON FERN. *See* **Vittaria.**

RIBES. To the species described on pp. 304-6, Vol. III., the following should be added:

R. alpinum pumilum (dwarf). A very dwarf, yellow-flowered garden variety. 1881.

R. americanum (American). The correct name of *R. floridum.*

R. aureum aurantium minus (orange, dwarf).* *fl.* of a rich yellow. A very free-flowering variety, of close, compact habit.

R. bracteosum (bracteate).* *fl.* greenish, in erect racemes often 6in. to 10in. long; pedicels exceeding the spathulate bracts. *fr.* black, with resinous dots. *l.* often 6in. in diameter, long-petiolate, cordate, deeply five- to seven-lobed, resinous-dotted beneath; lobes acuminate, coarsely doubly-serrated or incised. *h.* 5ft. to 8ft. Oregon, &c. A striking species. (B. M. 7419.)

R. Bridgesii (Bridges'). A garden synonym of *R. villosum.*

R. crythrocarpum (red-fruited). *fl.* reddish, in erect racemes. *fr.* brilliant scarlet, almost pear-shaped, glandular-hairy. *l.* orbicular, three- to five-lobed. Stems creeping, rooting hairy, with erect branches. *h.* 4in. to 6in. Oregon, 1897. (G. & F. 1897, p. 184, f. 21.)

R. fasciculatum (fascicled). *fl.* four or five in shortly-pedunculate, erect fascicles. *l.* cordate at base, three- or obsoletely five-lobed; lobes ovate, obtuse, deeply toothed, 1in. long and broad, pubescent beneath, the teeth mucronulate. Branches somewhat flexuous, unarmed, with whitish bark. China and Japan.

R. floridum. The correct name is *R. americanum.*

R. fragrans (fragrant). A synonym of *R. aureum præcox.*

R. fuchsioides (Fuchsia-like). A synonym of *R. speciosum.*

R. integrifolium (entire-leaved). *fl.* greenish-yellow, small, bracteate, disposed in rather short racemes. *l.* oblong-lanceolate, serrated, acute. Chili, 1880. (R. G., t. 1047, f. 6.)

R. japonicum. According to the "Index Kewensis," this is now regarded as a distinct species, and not as a variety of *R. alpinum.*

R. Lavallei (Lavalle's). A garden synonym of *R. villosum.*

R. Menziesii (Menzies'). *fl.* red or deep rose-colour, large; peduncles one- or two-flowered, as long as the leaves. March to May. *fr.* densely bristly. *l.* cordate, five-lobed, incised-serrated, veiny and rugose, pubescent-tomentose beneath. Stems prickly or naked. *h.* 2½ft. to 5ft. California, 1830. (B. R. 1847, t. 2368.)

R. missouriense (Missouri). A synonym of *R. americanum.*

R. oxyacanthoides Purpusii (Purpus's). *fl.* greenish, small. *fr.* blackish-red, acid. Colorado, 1899. A dwarf bush, with spreading or pendulous twigs.

R. prostratum (prostrate). *fl.* greenish; racemes erect, slender. May. *fr.* pale red, and, as well as the pedicels, glandular-bristly. *l.* deeply cordate, five- to seven-lobed, smooth; lobes ovate, acute, doubly serrated. Stems reclining, neither prickly nor thorny. North America, 1812. A capital rockery plant.

R. recurvatum (recurved). A synonym of *R. americanum.*

R. sanguineum albidum (whitish). *fl.* whitish, slightly suffused with pink, and with a deeper shade in the centre.

R. s. atrosanguineum (dark blood-coloured). *fl.* larger and brighter than in *atrorubens.*

R. s. flore-pleno (double-flowered).* A fine variety, with double flowers which remain a long time in perfection. (P. M. B. xii., p. 121.)

R. Spaethianum (Spaeth's). A species resembling, and very nearly allied to, *R. cereum.* Colorado, 1899.

Ribes—*continued.*

R. stamineum (having prominent stamens). A synonym of *R. speciosum.*

R. succirubrum (red-juiced). A hybrid between *R. divaricatum* and *R. gracile.*

R. villosum (villous), of Gay, *not* of Nutt. *fl.* golden-yellow, sub-sessile, about ¼in. long and broad; racemes spiciform, sub-erect or drooping, shorter than the leaves, dense-flowered. June. *l.* petiolate, orbicular-ovate, 1in. to 1½in. across, sub-entire or broadly three-lobed, lurid green. Chilian Cordillera, before 1858. An erect, glandular-tomentose shrub. (B. M. 7611.) SYNS. *R. Bridgesii* and *R. Lavallei* (of gardens).

RICHARDIA. The old method of growing *Richardia africana*—namely, of drying them off in summer and starting them again in autumn—is gradually falling into desuetude. In fact, it has been abundantly demonstrated that this species may be made to furnish its spathes continuously. By this system, when making new growth, the plants are kept in the beds or borders; or again, they may be potted up and left outside until they have recovered from the slight check received and become established. In the dull months of the year and in spring they should be kept fairly cool, well watered, and from time to time given a suitable stimulant. *R. Elliottiana* and *R. angustiloba* (*Pentlandii*) should be grown in the warm pit during winter, and in the cool one during summer.

To the species described on p. 307, Vol. III., the following should be added:

FIG. 651. RICHARDIA ELLIOTTIANA.

R. africana. A curious form of this species with a branched spadix is figured in G. C. 1895, xvii., p. 135, f. 19, 20. *nana compacta* is a compact form, less than half the height of the type, but with flowers almost as large.

R. albo-maculata sulphurea (sulphur-coloured).* A variety having a soft-yellow spathe with black centre, and elegantly spotted foliage.

R. angustiloba (narrow-lobed).* *fl.*, spathe 4in. to 4½in. long, the limb clear deep gamboge-yellow, with a dark purple-brown blotch at the base inside, paler outside, oblique, nearly horizontal; spadix scarcely half as long. *l.* 7½in. to 17in. long, 4in. to 11in. broad, elongate-deltoid or -oblong, acute or acuminate, hastate, with short or long and spreading basal lobes and a very open sinus. 1892. SYN. *R. Pentlandii*

Richardia—*continued.*

(B. M. 7397), under which name it is generally catalogued by the trade and it is grown at Kew.

R. aurata (golden). A synonym of *R. hastata.*

R. Elliottiana (Capt. Elliott's).* *fl.*, spathe bright golden-yellow, 6in. long, the tube between funnel-shaped and campanulate, the limb 3in. long and broad, with a caudate tip; spadix orange-yellow, about 3in. long; peduncle nearly 3ft. high. August. *l.* nearly 1ft. long, 7in. broad, orbicular-ovate, deeply cordate, apiculate, with transparent blotches (see Fig. 651); petioles as long as the leaves. 1896. (B. M. 7577.)

R. Lehmanni. A misprint for *R. Rehmanni.*

R. Lutwychei (Lutwyche's). Pride of the Congo. A synonym of *R. hastata.*

R. Pentlandii (Pentland's). A synonym of *R. angustiloba.*

R. Rehmanni (Rehmann's). *fl.*, spathe 3in. to 4½in. long, the limb bright rosy-purple, darker at the base within but not blotched, or white or greenish-white to the base within, with rosy-tinted margins; spadix not half as long. *l.* 7½in. to 15in. long, 1in. to 2in. broad, lanceolate, subulate at apex, green or white-spotted. 1893. (B. M. 7436; G. C. 1893, xiv., p. 564, f. 94, as *R. Lehmanni* [by error].)

R. Rhodesia (Rhodesian). *fl.* having a very large spathe of a rich, dark golden hue. 1898.

R. suffusa (suffused).* This appears to be merely a robust form of *R. melanoleuca.* 1899.

RICHARDSONIA PILOSA. This is the correct name of the plant referred to in Vol. III. as *R. scabra.*

RICINELLA. A synonym of **Adelia** (which *see*).

RICINUS. To the species described on p. 308, Vol. III., the following varieties should be added. *Fatsia japonica* (*Aralia Sieboldii*) is, in London, often sold as the Castor Oil Plant (*R. communis*) to the uninitiated. The fruits of these are curious in autumn.

R. cambodgensis (Cambodia).* This is a handsome form of *R. communis*, with large purple leaves and blackish stems and branches.

R. communis borbonensis arboreus (Tree-like).* The foliage is bronzy-green, and the plant grows to a height of 5ft. A capital subject for lawns.

R. c. cinerascens (greyish). The foliage in this is brownish-purple, becoming deeper.

R. c. enormis (enormous). *l.* large, brownish-purple, changing to dark green or red when older.

R. c. Gibsonii atrosanguineus (dark-red). A form with crimson-red leaves, and growing some 4ft. or 5ft.

R. c. maculatus (spotted). A variety with coppery-bronze foliage and red veinings thereto.

R. c. zanzibarensis (Zanzibar).* *l.* bright green, with whitish veins, handsome, 2ft. across. *fr.* having the seeds much larger than, and different in shape from, those of the typical *R. communis.* *h.* 6ft. to 8ft. Eastern tropical Africa, 1894. (R. G. 1894, p. 75, f. 20.)

RIDAN. A synonym of **Actinomeris** (which *see*).

RIDDLING. This consists in Riddling soil through a fine sieve for sowing very fine seeds on, putting in cuttings, &c. It is also employed for the removal of objectionable substances—such as broken pieces of pots, &c.—from soils which it is intended to usefully employ.

RIGIDELLA. According to J. G. Baker, *R. orthantha* (F. d. S. 46) is apparently a mere form of *R. flammea* with shorter, stouter, erect pedicels.

RIPENING WOOD. A very important detail in the production of fine fruit and flowers is the proper Ripening of Wood. This may be effected by the removal of all useless wood in August, thus exposing what is left to the full action of sun and air. Again, in trained plants and trees the wood must not be congested, or it will not properly mature, and the results the following year will be unsatisfactory.

RIPE ROT. *See* **Apple Rot.**

RIPERSIA TERRESTRIS. *See* **Mealy Bug.**

RITCHIEA. To the species described on p. 309, Vol. III., the following, which is now regarded as a distinct species, should be added:

R. polypetala (many-petaled). *fl.* pale straw-coloured, 4in. across, three to five in terminal, erect corymbs; petals about fourteen, very narrow. *l.* alternate; leaflets three to five, as long as, or longer than, the petioles, oblong or obovate-lanceolate; petioles 3in. to 5in. long. Western Africa. An erect, glabrous shrub. (B. M. 5344.)

RIVEA. *See also* **Argyreia.**

RIVINA. *R. lævis* is now regarded as a form of *R. pubescens.*

ROADS. *See also* **Landscape Gardening.**

ROAN-TREE. *See* **Pyrus Aucuparia.**

ROBBER FLIES. *See* **Hornet Fly.**

ROBINIA. To the species and varieties described on pp. 309-10, Vol. III., the following should be added. Several plants formerly included in this genus are now referred to **Calpurnia, Caragana, Halimodendron, Lonchocarpus, Ormosia, Pictetia,** &c.

R. coccinea (scarlet). A synonym of *Ormosia coccinea.*

R. glutinosa (glutinous). A synonym of *R. viscosa.*

R. hispida inermis (unarmed). A synonym of *R. h. macrophylla.*

R. macrophylla (large-leaved). A form of *R. hispida.*

R. neo-mexicana (New Mexican).* *fl.* pale rose-coloured, disposed in dense, short, clustered racemes; peduncle and calyx glandular-pubescent. Autumn. *fr.*, pods resembling those of *R. viscosa.* *l.*, leaflets elliptic or oblong, glaucous. Prickles stipular, somewhat recurved. *h.* 4ft. to 6ft. New Mexico, 1891. A useful tree for park or garden, somewhat resembling *R. Pseudacacia.*

R. n.-m. luxurians (luxuriant). *fl.* in compound racemes, sometimes borne twice a year. Southern Rocky Mountains, 1892. Larger than the type.

R. Pseudacacia angustifolia (narrow-leaved). A narrow-leaved variety. 1839.

R. P. aurea (golden).* A golden-leaved form. It requires a sunny spot.

R. P. inermis albo-variegata (variegated). A pretty form of *inermis*, having variegated leaves.

R. P. mimosæfolia (Mimosa-leaved). *l.* finely divided.

Among numerous other varieties are: *dissecta, pendula, Rehderi, revoluta,* and *spectabilis.*

R. rosea (rosy). A synonym of *R. hispida.*

R. squamata (scaly). A synonym of *Ormocarpum sennoides.*

ROCHEA. To the species described on p. 310, Vol. III., the following should be added. *See also* **Crassula.**

R. hybrida albiflora (white-flowered hybrid). A hybrid between *R. jasminea* and *R. odoratissima.* 1894.

R. tiniflora (Tinus-flowered). *fl.* snow-white, very numerous, in a broad, compact, terminal cyme; peduncles and pedicels very short; stamens brownish-scarlet, forming a fine contrast. *l.* small, ovate, broadly sheathing at base. 1861. SYN. *Larochea tiniflora.*

ROCK BROOM. *See* **Genista.**

ROCK CARROT. *See* **Thapsia edulis.**

ROCK JASMINE. *See* **Androsace.**

ROCK LYCHNIS. A common name for the species of **Lychnis** (which *see*) formerly classed under *Viscaria.*

ROCK TOBACCO. *See* **Primulina Tabacum.**

ROCKET LARKSPUR. *See* **Delphinium Ajacis.**

ROCKSPRAY. *See* **Cotoneaster.**

RODDON-TREE. *See* **Pyrus Aucuparia.**

RODRIGUEZIA. **Burlingtonia** (which *see*) is now included in this genus. To the species described on p. 311, Vol. III., the following should be added. Other plants formerly classed hereunder are now referred to **Gomeza.**

R. Bungerothi (Bungeroth's). *fl.* purplish; sepals and petals resembling those of *R. secunda*; lip cuneate-obovate, bilobed, with a well-developed, triangular, descending spur; column quite naked, white; inflorescence dense. Venezuela. A near ally of *R. secunda.* (L. iii., t. 127.)

R. crispa (curled). The plant sometimes described as such is *Gomeza crispa.*

R. decora (comely). The correct name of *Burlingtonia decora.*

R. Fuerstenbergii (Fuerstenberg's). *fl.* 2in. long and more than 1in. broad; sepals rose-coloured; petals and lip white, blotched with yellow; raceme 1ft. long, three-flowered. *l.* (and pseudo-bulbs) small. Habitat not recorded, 1890. Allied to *R. Lecana.*

R. Lecana picta (painted).* *fl.* covered with numerous mauve-purple lines and spots, which are almost circular on the fine lip. A fine variety. 1885.

R. Lindeni (Linden's). A synonym of *R. pubescens.*

Rodriguezia—*continued.*

R. luteola (yellowish). *fl.* yellowish, small, having all the parts connivent, and disposed six to nine in a raceme. Habitat not recorded, 1833.

R. pubescens (downy). This is the correct name of the plant described on p. 225, Vol. I., as *Burlingtonia pubescens.* (L. 306.) SYN. *R. Lindeni.*

R. anomala has also been introduced.

ROELLA. To the species described on p. 312, Vol. III., the following should be added:

R. decurrens (decurrent). A synonym of *Wahlenbergia capensis.*

R. elegans (elegant). *fl.* bright blue, with a purple stain in the throat, solitary, axillary. February to May. *l.* partially spathulate, sessile, opposite, slightly crenate, acute, hairy. Stem erect, hairy. *h.* 9in. 1836. (P. M. B. vi., p. 27.)

R. muscosa (mossy). *fl.* blue, terminal, solitary; corolla ¼in. long, funnel-shaped. August. *l.* one to four lines long, ovate, spreading-reflexed. Branches filiform, leafy, 1in. or more in length. 1802. A very dwarf, trailing perennial.

R. squarrosa (squarrose). *fl.* white, terminal, clustered or rarely solitary; corolla five-cleft. July. *l.* decurrent, ovate, acute, one to two lines long. Stem erect, woody, 6in. to 12in. high, branched above or from the base; branches reddish. 1787.

ROESLERIA HYPOGÆA. *See* **Vine Fungi.**

ROESTELIA CANCELLATA. *See* **Pear—Fungi.**

ROËZLIA REGIA. A garden synonym of **Furcræa Bedinghausii** (which *see*).

ROFFIA. *See* **Raphia.**

ROMANOWIA NICOLAI. This name has been given to a dwarf-growing Palm having pinnate leaves made up of about a dozen cuneate segments, blackish-brown above, pale green shaded with violet below. It was introduced to Continental gardens in 1899, but the habitat is not recorded.

FIG. 652. ROMNEYA COULTERI.

ROMNEYA. Californian Bush Poppy. *R. Coulteri* (Fig. 652), the only species of this beautiful genus, was described in Vol. III. as but half-hardy. It has, however, since proved hardy, but it needs a position where it can get plenty of sun and a good deep soil. Then it will produce its flowers freely, and over a long period—from early summer till early autumn. Even near towns we have seen it doing well, providing the conditions named obtained, and the best plant that we remember was in a cottage garden at Croydon. There it was growing luxuriantly, and had attained a height of over 6ft. It is a herbaceous perennial of the first water.

ROMULEA. In his "Handbook of *Irideæ*" J. G. Baker reduces the number of species to thirty-three. To those described on pp. 312-3, Vol. III., the following should be added:

R. Clusiana (Clusius'). *fl.* bright yellow, pointed with lilac; stamens yellow; scape simple or forked from the base. *l.* about four, arched, 6in. to 12in. long. Spain and Portugal. There is a form with white flowers.

R. longifolia (long-leaved). The correct name of *R. cruciata.*

R. Macowani (Macowan's). *fl.* 1in. to 1¼in. in diameter, bright golden-yellow in the lower part, lighter upwards, often tinged red at the tips; stamens half as long as the segments. *l.* long, spreading, sub-terete. Stems short, one- to four-flowered. South Africa. Greenhouse. (G. C. 1887, i., pp. 180, 184, f. 42.)

R. pudica is a variety of *R. rosea.*

R. speciosa (showy). This is a variety of *R. rosea*, with deep carmine flowers. (B. M. 1476.)

RONDELETIA. *R. odorata major* is a form with larger flowers than in the type.

RONNBERGIA COLUMBIANA. A synonym of **Quesnelia columbiana** (which *see*).

ROOM PLANTS. The cultivation of Room Plants constitutes a most interesting phase of gardening. The chief causes of failure are: purchasing from a wrong source, injudicious treatment—in either watering, the application of stimulants in too great quantities or at inopportune times—bad potting, too frequent shifts, attempts to increase the stock, frost, draught, dust, and bad drainage. There are comparatively few insect and other enemies to Room Plants, and those which are in evidence are easily dealt with. Soil, of course, is a factor in their culture, and one that is also but little understood.

The source whence a plant is obtained has a most important bearing upon its future welfare, and particularly in the case of those foliage subjects which in a state of nature require a hot, moist temperature, and whose surroundings have as nearly as possible to be imitated when they are grown artificially here. Despite the fact, however, that many of our finest foliage Room Plants are natives of warmer climes, they are sufficiently accommodating to live amidst very different surroundings if they are but intelligently treated. The travelling hawker is always to be avoided. The plants he has for disposal have been grown on by a method to fit them for quick sale, and their lives are most ephemeral. India-rubber Plants, Palms, Fatsias, and numberless Ferns are raised in large quantities to supply the markets, and such are about the worst that can be purchased if a long life is desired. To get the best possible results with Palms and such like they should be purchased from a trustworthy nurseryman or florist who has prepared the plants for the treatment they are likely to undergo. They should also be purchased in late spring or summer: never in winter or in autumn.

Frost and draught are most powerful enemies against which the cultivator of Room Plants has to contend. A window is the most suitable position for plants generally in the daytime, as there they get a maximum of light and sunshine. At night, in winter, the case is different. A good plan is to have at hand a couple of wire stands, on to which the plants could be moved at night, and these should be placed in the centre of the room, or else in a corner where draughts are not prevalent at night, and, if necessary, further surrounded by a temporary screen of stout tiffany, which can easily be mounted upon a roughly-constructed frame. By this means the dangers from frost are considerably reduced, and the plants can easily be returned to their quarters in the window in the morning. Some further protection may be necessary in the case of Palms, and this will be referred to further on.

Air is very necessary to the well-being of plants. In winter time the top sash may be allowed down in living rooms, say a couple of inches, this space being filled by a piece of close wire gauze-like material; this may be so arranged that at any time the window may be at once closed. The door should not be left open at the same time as the window, or the result will be disastrous to plant life, especially when cold and drying winds are prevalent. Plants, too, which are used for hall decoration must also be guarded against frost and draught.

Dust on the foliage clogs the breathing pores. Where, therefore, Palms, Euryas, Aspidistras, Indiarubber Plants,

Room Plants—*continued.*

and similar stout-textured foliage subjects are employed in rooms, they should be carefully kept clean of dust and dirt, and the best means of doing this is with a sponge and some soft lukewarm water. This should be done twice a week, or oftener in the case of very dusty apartments.

The importance of good drainage in the case of pot- or box-plants can hardly be over-estimated. An imperfectly drained pot soon causes the best and freest of soils to sour, and quickly destroys the most promising of plants. Especial care must be given to the pieces covering the hole or holes of the pot or box. The other drainage material must be so arranged that the water passes freely through. The amount of drainage, and even the kind employed, will vary a little with the class of plant. As a rule, pieces of old pots and broken or whole oyster shells are amongst the best for plants in general. Cactuses require special treatment in the matter of potting, and this is fully dealt with under **Cactus.**

Before a plant can be properly potted, its requirements must be known to a nicety, for whereas in the majority of cases crowded root-space might be taken as an almost certain indication of the need of a shift, there are plants which succeed better the less they are interfered with, so long as they receive some assistance by means of top-dressings or stimulants. All classes of Room Plants are not equally affected, and therefore no hard-and-fast rule can be laid down. Palms yield the best results when they are not given too much room; and a frequent cause of failure is shifting them too frequently. The roots must be the absolute guide to repotting. So long as these are not too crowded, the drainage is ample, and the plant exhibits a healthy appearance, it should not be repotted. And so it is with many other of the foliage plants used for room decoration—Aspidistras in particular. Then the manner of potting will vary with the class of plant; Chrysanthemums, for instance, require the compost tightly rammed, and so also do Palms. As a general rule, hard-wooded plants, like Heaths, require to be more firmly potted than soft-wooded ones, like Pelargoniums.

Palms, according to Dr. Udo Dammer, are best potted so that the soil slopes gradually from the side down to the centre. By this means moisture is best conveyed to the centre of the ball of earth, which otherwise frequently remains dry, to the detriment of the roots. This should be well borne in mind when repotting.

Again, in potting a plant, the condition of the soil will have to be taken into consideration. If it is too dry, repotting must not be undertaken. The soil must be moist without being wet. The pots must also be thoroughly clean and dry. No plant should be placed in a wet or a dirty pot. Where, therefore, washing has been resorted to, or new pots have been soaked, as they should be, they must be thoroughly dried before being used. Spring may safely be put down as the best time for repotting, as then it is that roots are most active.

The best water for any purpose is pure rain water. Cold tap water should *never* be used. The next best thing to rain water is that from a stream or well. In towns, of course, this latter source of supply is not available, and the cultivator must then use tap- or pump-water. It should be kept in a large receptacle where the sun can shine upon it, and be brought to the requisite temperature by the addition of hot water, if necessary.

A fairly good method of telling if water is needed is to strike the pot with the knuckles, and if a clear ringing sound is emitted, it may usually be assumed that water is needful, although sometimes the dull, heavy sound one connects with a plant having a sufficiency of water is given off if the roots are amply filling the space at their disposal. Palms are somewhat difficult subjects for the majority of amateurs to judge of, but if the foliage of the stout-textured species be flaccid and readily rolled, especially towards the apex, water is then badly needed. The rough-and-ready method previously suggested holds good least of all with Palms, for, as already has been stated, they should be restricted as regards root-room, and, therefore, even if dry, the ringing sound is less likely to be given off.

The best time for watering depends upon the season: in the winter, morning should be selected, so long as

Room Plants—*continued.*

there is no danger of frosts; while even in summer, if the cultivator does not mind getting up early, morning is the best time, so long as it is done before the sun gets too powerful; otherwise his operation had better be deferred until the evening. In any case merely wetting the top soil is not of the slightest use—indeed harmful, as it cakes the surface; the plant should have a good soaking. Cactuses require special treatment as regards watering, and this is mentioned under their respective heads.

Most plants dealt with here may be grown successfully in a combination of fibrous loam, leaf-soil, and sand. Two parts of the first-named to one part of the others will be about the correct proportions. Exceptions are the Cactuses, when to fibrous loam and sand should be added broken brick rubble to the extent of nearly one-half; and some of the hard-wooded plants like Heaths,

FIG. 653. OPHIOPOGON JABURAN VARIEGATA.

when peat may replace the leaf-soil, though it is not absolutely necessary, as has often been proved. For Ferns, there should be a preponderance of peat in the compost. Potting soils may be bought ready mixed in those cases where no convenience exists for storing them on the premises. This is the better plan to adopt. In most gardens, however, there would be room, say, for providing a supply of leaf-soil. Leaves of any kind can be thrown into a heap, but the best soil is that prepared from the leaves of Oak and Elm.

All plants require assistance from time to time in order to allow of their perfecting their growth, and of recuperating those energies exhausted in bringing forth their crop of flowers, fruit, or foliage. Taken all round, the most convenient for the general run of gardeners who go in for pot-plants are the "artificials." Where, however, the conveniences exist, there should always be kept a tub of soot-water (made by sinking a bag of soot in any large tub) and some liquid cow-manure. These two manures are most useful in giving colour to such foliage plants as Palms, Aspidistras, and the like.

Room Plants—*continued.*

First as to Foliage Plants, of which Palms are the chief of the species best suited to room cultivation, the following may be named: *Howea Forsteriana* (*Kentia Forsteriana*); *Livistona chinensis* (*Latania borbonica*); *Trachycarpus excelsus* (*Chamærops excelsa*) and *T. Fortunei* (*Chamærops Fortunei*); *Rhapis flabelliformis*; *Phœnix rupicola* and *P. reclinata*; *Cocos Weddeliana* and *C. plumosa* (*Leopoldinia pulchra*); *Archontophœnix Cunninghamiana* (*Seaforthia elegans*, *Ptychosperma Cunninghamiana*); *Sabal Adansonii* and *S. Blackburniana* (*S. umbraculifera*); *Jubæa spectabilis*; *Nannorhops Ritchieana*; and most of the Arecas. Other good Plants in this section are *Aspidistra lurida*, *A. l. variegata*, and *A. elatior*; *Fatsia japonica* (*Aralia Sieboldii*), which should be freely watered from late spring until late summer, and afforded a shady position; *Cordyline australis* and *C. indivisa*; *Ficus elastica* (India-rubber Plant); *Maranta major* (easily managed if given a position where it does not get the direct rays of the sun); *Eurya japonica* and its variegated variety; *Phormium tenax* and its equally desirable and more effective variegated forms; *Ophiopogon Jaburan variegata* (Fig. 653); *Araucaria excelsa*; *Carex japonica variegata*; *Dasylirion acrotrichum* and *D. glaucophyllum latifolium*; *Yucca filamentosa aureo-variegata* and *Y. aloifolia*; *Agave americana* and its variety *variegata*, and *A. univittata*; *Chlorophytum elatum variegatum* (better known perhaps as *Anthericum variegatum* and *Phalangium argenteolineare*); *Cyperus alternifolius* and its variegated form; *Pandanus Candelabrum variegatus*; *Eulalia japonica foliis variegata*; Rex Begonias; Coleus; and Ferns.

Amongst flowering plants there are a host of Cactuses, including *Cereus flagelliformis* (Rat's Tail Cactus), *C. Berlandieri*, *C. cæspitosus*, *C. pentalophus* (*C. leptacanthus*), *C. Blankii*, and *C. polyacanthus*; *Echinocactus gibbosus* and *E. hexædrophorus*; *Echinopsis Pentlandi* and its varieties, *E. Eyriesii* and *E. oxygona*. *Mammillaria bicolor*, *M. gracilis*, *M. sanguinea*, and *M. elongata*, are all good.

In bulbs and tubers Crocuses, Hyacinths, Scillas (Squills), Snowdrops, Daffodils, and other Narcissi (including the Chinese Sacred Lily) are all indispensable. Then there are Solomon's Seal (*Polygonatum multiflorum*); the Scarborough Lily (*Vallota purpurea*); Ixias and Sparaxis; *Allium neapolitanum*, *A. azureum*, and *A. Macnabianum*; *Anomatheca cruenta*; *Freesia refracta alba*; Erythroniums; *Lachenalia pendula* and *L. tricolor*; *Nerine sarniensis* and *N. Fothergilli* (*curvifolia*) *major*; Tuberoses; Lilies like *L. speciosum* and its varieties, *L. longiflorum*, *L. auratum* and its varieties, and *L. Harrisi*; *Fritillaria Meleagris*, *F. aurea*, and *F. armena*; Montbretias; *Schizostylis coccinea*; early-flowering Gladioli; Watsonias; Zephyranthes; and the dwarf Iris species.

Of tuberous plants there are Anemones like *A. coronaria* (both single and double); Tuberous Begonias; *Cyclamen Coum*, *C. europæum*, *C. hederæfolium* (*C. repandum*), *C. Atkinsii*, and *C. libanoticum*; and *Eranthis hyemalis*.

Geraniums (Pelargoniums); Musk; Stocks; Asters; Forget-me-Nots (*Myosotis*); *Primula obconica*, *P. sikkimensis*, *P. denticulata cashmeriana*, and *P. rosea*; Cinerarias; Common Christmas Rose (*Helleborus niger*); *Deutzia gracilis*; *Hydrangea hortensis*; *Cytisus racemosus*; *Coronilla glauca*; the well-known *Dicentra* (*Dielytra*) *spectabilis*; *Astilbe* (*Spiræa*) *japonica*; and *Francoa ramosa* (Bridal Wreath) and *F. appendiculata*, are other excellent floral subjects.

Room Plants—*continued.*

Of Ferns, the kinds available for use as pot-plants for indoor decoration are fairly numerous, and include *Pteris cretica albo-lineata*, *P. quadrita argyrea* (*P. argyrea* of some), *P. serrulata*; *Todea barbara*; *Asplenium bulbiferum*, *A. b. Fabianum*, *A. b. laxum*, *A. flaccidum*, and *A. Trichomanes*; *Pellæa* (*Platyloma*) *rotundifolia*; *Cyrtomium falcatum* and its varieties *Fortunei* and *caryotideum*; *Scolopendrium vulgare* (Common Hartstongue); *Lomaria Spicant*; and *Polypodium vulgare cambricum*.

For use as basket plants, Ivy-leaved Pelargoniums; *Campanula isophylla*, *C. i. alba*, and *C. fragilis*; *Lysimachia Nummularia* (Creeping Jenny) and its variegated form; Ivies of sorts, but especially the variegated kinds; variegated Stonecrops (*Sedum*); *Zebrina pendula* (more familiarly known as *Tradescantia zebrina*); the common Musk; *Isolepis gracilis*; *Saxifraga sarmentosa*; Kenilworth Ivy (*Linaria Cymbalaria*); *Othonna crassifolia*; *Nierembergia gracilis*; *Tropæolum polyphyllum*; and such Ferns as *Asplenium caudatum* and *A. longissimum*; *Davallia retusa*; *Nephrolepis exaltata*, *N. acuta* and *N. pluma*; and *Woodwardia radicans*, are a few good subjects.

ROOT-PRUNING. When fruit trees are making rampant growth and bearing little or no fruit, the cultivator adopts a judicious system of Root-pruning to check excessive growth, and to throw the trees into a fruit-bearing condition. As to the method of procedure, no hard-and-fast rule can be laid down, as the size of the tree and other conditions must be considered. If a tree is large, and has not been disturbed at the roots for many years, it is advisable to Root-prune only one side at a time. If it were done all round at once the check given would be so severe that death would result, or, at any rate, very serious injury for a number of years. In dealing with a large tree, a deep trench should be dug, about as far from the stem as the branches extend in the case of standards or half-standards, and about 8ft. to 12ft. away from the stem or trunk of trained trees, according to their size. The trench ought to be sufficiently deep to enable the operator to cut through all roots. Afterwards, with a fork, the soil should be worked out from amongst the roots towards the trunk, cutting through all roots that strike directly downwards into the sub-soil. All other roots should be carefully preserved and kept moist. Having bared all the roots nearly to the trunk, all those badly injured should be cut back, and then evenly laid in the soil again, and if fresh soil can be added so much the better. The soil about the roots should be firmly trodden, thus encouraging fibrous roots near the surface. In two years the other side of the tree or trees may be treated in a similar manner.

Smaller trees may be lifted bodily, all the long, straggling roots cut back, and replanted, thus effectually checking superabundant growth. In nurseries where specimen trees are grown for sale, they are lifted and Root-pruned every two years, to keep them movable with good balls of earth attached to the roots. The great point in successfully Root-pruning large or small trees, is to commence operations far enough away from the trunk to ensure a good quantity of uninjured roots for laying in the soil.

ROOTS. The formation of good fibrous Roots is essential for the production of healthy plants, flowers, and fruit. To attain this object it is requisite that a suitable medium for root-growth should be obtained. With the exception of Bog Plants, drainage for surplus moisture to pass away is absolutely necessary, otherwise the stagnant water will destroy all the finer and most valuable Roots. Soil, again, must be suited to the requirements of the plants. Rhododendrons, Ericas, and plants of that class, for example, quickly become unhealthy when the Roots come in contact with lime. Fruit-producing trees, on the other hand, must have lime to form and develop their crops, and if it is not present naturally, it must be applied to the Roots by the cultivator. Some plants need a loose soil which the Roots can easily penetrate for their growth; while others, especially the Vine, Fig, and, in fact, most fruit trees, give the finest results when the rooting medium is very firm, which causes the production of a mass of fibrous Roots, followed by short-jointed, sturdy wood, certain to bear satisfactory crops of fruit. On the other hand, if the soil were loose and easily perforated by the Roots, these would be long, thick, practically

Roots—*continued.*

devoid of fibre, and the growth of the wood long-jointed, sappy, and unfruitful. In those orchards where the finest and heaviest crops of fruit are produced, every effort is made to encourage the Roots to the surface by feeding, and therefore it is very unwise to mutilate the Roots by surface-digging. In fact, with some plants, such as Raspberries, it is most injurious, as the best Roots are thus destroyed. Every year the pernicious system of digging amongst trees and shrubs is answerable for ill-health and deaths, and what should be the most beautiful part of the garden is rendered more or less unsightly by dead and dying portions of the shrubbery through Root-mutilation. In the removal of plants and in replanting, as little damage as possible should be done to the Roots. From the time of lifting until replanted, the Roots should be kept moist: if they are allowed to become dry during the interval, a serious check to the trees or plants will follow.

ROSA. In Vol. III. the more injurious Fungi were dealt with at considerable length, and little need be added to the information there given. For the very common Mildew (*Sphærotheca pannosa*), sulphur in some form is still the best fungicide for staying the progress of the disease. Powdered sulphur has long been employed by gardeners, and it is fairly effectual. Far better results are, however, obtainable by using it in combination with quicklime (three parts of flowers of sulphur and one part of powdered quicklime). Many rosarians, however, prefer to either the clear preparation liver of sulphur in solution (1oz. to 3 gallons of water). (*See* **Fungicides.**) For the Orange Rust (*Phragmidium subcorticatum*) weak Bordeaux Mixture should be used. This should be in combination with the collection and burning of all fallen leaves in autumn and the employment of copper sulphate solution (1oz. copper sulphate to 2 gallons of water) in early April. This latter is also effectual in the case of the "Spot" Fungi prevalent in many places.

In respect of Mildew, it may be stated that the Hybrid Perpetuals as a section are far more liable to attack than are the Teas, the Hybrid Teas, and the Noisettes. This point does not as often receive attention when the gardener is making a selection as it might.

For "Canker," which, as in the case of Apple-Tree Canker, is characterised by the splitting of the bark, the remedies under **Canker** may be found of use.

INSECTS AND OTHER ANIMAL PESTS. As in the case of Fungi, little by way of addition is called for here. Broadly it may be stated that outside for insects which chew, like the Sawflies and certain Moth Caterpillars, feeding exposed, there is nothing so good as hellebore, either as a powder or in solution, or a solution of Paris Green (*see* **Insecticides**). Both are, however, virulent poisons, and must be carefully kept. For Aphides (*see* **Aphides**) and other pests which suck, Kerosene Emulsion, soft-soap solution, or even hot water, may be tried. Under glass the gardener must largely rely upon syringing and fumigation to keep pests in check, together with, in the case of Scale, the application of Kerosene Emulsion by means of a sponge or a brush. One of the most troublesome of all pests falling under this heading is a species of Eelworm at the roots of pot Roses. The Eelworm is readily introduced with the potting soil. *See* **Eelworms** in present Volume, and **Nematoid Worms** in Vol. II., for remedies and means of prevention.

To the species and varieties described on pp. 319-25, Vol. III., the following should be added. The changes in nomenclature are based on the "Index Kewensis."

R. acicularis nipponicus (Nippon). *fl.* rich rose, solitary, 1½in. across, borne on slender peduncles. *l.* pale green. Branches slender. Japan, 1899. An erect bush. (B. M. 7646.)

R. alpina pyrenaica (Pyrenese). A spiny variety with rose-pink flowers and very long fruits.

R. anemonæflora (Anemone-flowered). The correct name of *R. indica anemonæflora*.

R. anserinæfolia. The correct name is *R. Beggeriana*.

R. Beggeriana (Begger's). The correct name of *R. anserinæfolia*. There are two varieties: *nigrescens* and *Schrenki*.

R. blanda Manettii (Manetti's). *fl.* of a beautiful clear rose, semi-double, very elegant. Lombardy, about 1820. *R. Fendleri* is another form of *R. blanda*.

R. borbonica, or **Bourbonia.** Bourbon Rose. *See* under *R. indica*.

Rosa—*continued.*

R. centifolia pæstumense (Pæstum). A variety having clear rose-coloured, double or semi-double flowers. 1895.

R. chinensis (Chinese). A form of *R. indica.*

R. clinophylla (bent-leaved). A synonym of *R. involucrata.*

R. damascena. This is considered by some authors to be a hybrid between *R. gallica* and *R. canina.*

R. d. belgica (Belgian). Rose of Four Seasons. *fl.* small but very odorous, six to twelve in a corymb. Intermediate between *R. damascena* and *R. centifolia.*

R. d. portlandica. Portland or Perpetual Rose. *fl.* of various colours, solitary or in twos or threes. *fr.* red, elongated. *l.* lanceolate, soft and glaucous beneath. Probably of English origin.

R. Ecæ. The correct name is *R. xanthina.*

R. Engelmanni (Engelmann's). A new species, allied to *R. alpina*, with oblong fruit. Colorado, 1889. (G. & F. 1889, p. 377, f. 121.)

R. ferruginea (rusty). The correct name of *R. rubrifolia.*

R. gallica conditorum (founder). A variety from which perfume is obtained in Asia Minor. 1889.

R. g. incarnata (flesh-coloured). *fl.* bright red. Branches unarmed. France. (B. M. 7035.)

R. g. provincialis (Provence). *fl.* of various dark tints, velvety. *l.*, leaflets mostly orbicular. France.

Attar of Roses is obtained from the forms *conditorum* and *trigintipetala.*

R. gigantea (gigantic). This is something in the way of *R. indica chinensis*, but larger, and differs in having solitary lemon-white flowers 5in. in diameter when expanded, but golden-yellow as a bud, with entire outer sepals and unarmed floral branches. Birma, 1888. (G. C. 1889, vi., p. 13, f. 4.)

R. glutinosa yarmalensis. *fl.* whitish-red, comparatively large. *l.* small. Spines strong, uncinate. *h.* 2½ft. Asia Minor, 1892. A good dwarf variety for the rockery.

R. Heckeliana (Heckel's). The correct spelling of *R. Hackeliana.*

R. heterophylla (variable-leaved). A garden hybrid between *R. rugosa* and *R. Eglanteria* (*R. lutea*). It bears white flowers.

R. humilis triloba (three-lobed). A curious variety, having the petals distinctly three-lobed. 1889. (G. & F. 1889, p. 76, f. 93.)

R. incarnata (flesh-coloured). A form of *R. gallica.*

R. indica chinensis. Chinese Rose. *fl.* reddish-crimson, medium-sized, slightly double, slightly odorous; sepals simple or pinnate, glabrous, caducous. Summer. *l.* consisting of three or five small, elliptic-ovate, acuminate leaflets, purplish beneath. China.

R. i. odorata (scented). A general name for the Tea Roses.

R. involucrata plena (full). A variety with large white flowers, rose-tinted.

R. lævigata is the correct name of *R. sinica.* There is a beautiful hybrid from this, known as ANEMONE.

R. Luciæ (Mme. Lucie Savatier's). *fl.* snow-white, solitary or sub-corymbose, fragrant; petals ¼in. to ⅜in. broad, orbicular-obovate, retuse. August. *fr.* purple or scarlet, small, globose. *l.*, leaflets five to nine, ovate, simply toothed, the upper ones shortly acuminate. Floriferous branches glabrous, sparsely prickly. Japan and China, 1880 and 1891. A profuse-flowering, prostrate shrub. (B. M. 7421.) SYN. *R. Wichuraiana* (G. & F. 1891, iv., ii., p. 570, f. 89), under which name it is usually catalogued and grown.

R. macrantha (large-flowered).* A form of *R. canina.*

R. Manettii (Manetti's). A form of *R. blanda.*

R. minutifolia (minute-leaved). *fl.* pink or white, 1in. across, solitary, disposed on short spurs along the branches. *fr.* globular. *l.* very small, composed of five or seven deeply-toothed leaflets. California, 1888. A species of compact, much-branched habit, armed with numerous straight spines. (G. & F. 1888, p. 102, f. 22.)

R. mollis omissa (remiss). *fl.* pink. *fr.* obovoid or pyriform, glabrous. *l.*, leaflets glandular beneath. France.

R. Noisettiana. *See* under **R. indica.**

R. omissa (remiss). A variety of *R. mollissima.*

R. Pissardi (Pissard's). *fl.* white, double, and fragrant. *h.* 15ft. to 18ft. Caspian Region. (R. H. 1880, p. 314, f. 62, 63.)

R. platyphylla (broad-leaved). A form of *R. multiflora.*

R. polyantha (many-flowered). A synonym of *R. multiflora.*

R. pomifera (pome-bearing). Great Apple Rose. *fl.* pink, solitary or a few together; peduncles short. *fr.* red or purplish, large, globose or pyriform, prickly. *l.*, leaflets about twice as long as broad, doubly serrated. Branches arched, with scattered, straight prickles. Europe. (B. M. 7241.)

R. Rapa (Rapa). A synonym of *R. lucida.*

R. reclinata (reclining). A form of *R. indica.*

R. repens flore-pleno (double-flowered). A white, double-flowered but flat monthly rose.

R. rubifolia (Rubus-leaved). A synonym of *R. setigera.*

R. rubrifolia. The correct name is *R. ferruginea.*

R. sinica. *R. lævigata* is the correct name.

R. villosa (villous) A synonym of *R. mollis.*

R. Watsoniana (Watson's). *fl.* white, and Myrtle-like. Summer. *l.* very slender. Japan.

R. Wichuraiana (Wichuray's). A synonym of *R. Luciæ.*

R. xanthina (yellow). The correct name of *R. Ecæ.*

Hybrid Perpetual Roses.

Prune in March, and always to a bud that points outwards. Weak kinds may be pruned hard to cause them to start vigorously; two or more buds may be left at the base of each shoot. Vigorous growers may be left longer, and pruned to the first large plump bud nearest the base of each shoot. Or in the case of Bush Roses the shoots may be left their entire length and pegged down, or else lightly pruned, as in the case of **Teas.** *All weak wood, and also shoots that cross each other, should be cut out, in order to let in daylight and air.*

FIG. 654. HYBRID PERPETUAL ROSE CLIO.

(From a Photograph by Richmond and Peto, Lustleigh, S. Devon.)

ALPHONSE SOUPERT, bright rose; ANNIE WOOD, bright red, large and full, imbricated, best in autumn; BACCHUS, bright violet-red, good autumn Rose; BARON HAUSSMANN, dark red; CAPTAIN HAYWARD, bright carmine-crimson, free, but somewhat thin; CHARLES LEFEBVRE, bright red, shaded with purple; CLIO, white, tinted flesh, large and free (see Fig. 654);

Rosa—*continued.*

COMTE DE RAIMBAUD, bright crimson, of good form, one of the best; CRIMSON QUEEN, carmine, shaded scarlet; DR. HOGG, deep violet, vigorous; DUCHESSE DE MORNY, light rose, silvery underneath, imbricated, full; DUKE OF ALBANY, bright crimson, large, an effective autumn variety; DUKE OF CONNAUGHT, bright velvety-crimson, of perfect shape, free; EARL OF DUFFERIN, rich velvety-crimson, globular; ELISE BÖELLE, white, large and full; ELLA GORDON, cherry-crimson, large, semi-globular, good in autumn; EXPOSITION DE BRIE, pale red, shaded crimson; FRANCISQUE RIVE, cerise, shaded carmine; GRAND MOGUL, deep crimson, large and free; GUSTAVE PIGANEAU, rosy-crimson, large, globular, not a good grower; HELEN KELLER, bright rose, with shell-like petals; JEANNIE DICKSON, rosy-pink, with silvery edges, beautiful as a bud; LADY SHEFFIELD, rosy-cerise; MADAME CHARLES WOOD, bright crimson, shaded purple; MADAME EUGENE VERDIER, light rose, globular; MDLLE. MARIE RADY, brilliant red, of good form; MARCHIONESS OF DUFFERIN, rosy-pink, large, of good form; MARCHIONESS OF LONDONDERRY, ivory-white, excellent in autumn; MARCHIONESS OF LORNE, rich rose, shaded carmine; MRS. JOHN LAING, soft pink, semi-globular, one of the best in autumn; MRS. R. G. SHARMAN CRAWFORD, rose-pink, with paler outer petals; PAUL'S

FIG. 655. ROSE PAUL'S EARLY BLUSH.

(From a Photograph by Richmond and Peto, Lustleigh, S. Devon.)

EARLY BLUSH (see Fig. 655, blush-white, profuse as to flower; PRIDE OF REIGATE, carmine, striped with white, of exquisite form; REV. ALAN CHEALES, pure lake, with silvery-white back petals; SALAMANDER, vivid scarlet-crimson, of good form; SILVER QUEEN, silvery-blush, shaded delicate rose, large, full, and cupped; SPENSER, satiny-pink, shaded white on outer petals; SUZANNE M. RODOCANACHI, light rose, shaded silver, a very attractive variety; T. B. HAYWOOD, crimson-scarlet, shaded black; TOM WOOD, cherry-red, shell-shaped, an excellent Rose; VICTOR HUGO, bright crimson, of elegant shape; VIOLETTE BOUYER, white, but sometimes tinted, one of the best; WALTHAM STANDARD, deep carmine, shaded scarlet, vigorous; WHITE BARONESS, pure white, excellent in autumn.

Rosa—*continued.*

Tea-scented Roses.

Under Glass: Severe pruning is never advised. Regulate the growth as made, and only shorten back the strong shoots. Outside: Dwarfs in beds may be cut down nearly to their base in April. Many, however, shorten back in March, and finish the pruning in April. Where exhibition flowers are required, the buds must be restricted to one on each shoot. Climbing Teas should never be hard pruned. All vigorous shoots should be allowed to remain practically their entire length. In all cases weak wood must be removed.

BRIDESMAID, pink, an improved CATHERINE MERMET; CLEOPATRA, pale pink, edged with rose; COMTESSE DE TURENNE, pale pink, shaded rose; ELISE FUGIER, white, with yellowish centre; EMPRESS ALEXANDRA OF RUSSIA, lake-red, shaded orange, globular; ERNEST METZ, rose-carmine, with brighter centre; ETHEL BROWNLOW, salmon-pink, shaded yellow at base of petals; FRANCESCA KRUGER, copper-red, shaded yellow and red; GOLDEN GATE, cream-white, slightly yellow-tinged, fine variety; HON. EDITH GIFFORD, white, tinted with rose; JULES FINGER, rose, with silvery shading; MADAME CUSIN, rosy-purple; MAMAN COCHET, light rose, shaded with yellow; MURIEL GRAHAME, cream-white, flushed rose; SOUVENIR DE GABRIELLE DREVET, pale salmon-red, with coppery-rose centre; SOUVENIR DE S. A. PRINCE, pure white; THE BRIDE, pure white.

Hybrid Tea Roses.

For method of pruning, see *under* **Teas.**

AUGUSTINE GUINOISSEAU, white, rose-tinted; BEAUTE LYONNAISE, white, faintly tinted with yellow; BELLE SIEBRIECHT, bright rosy-pink, very free; BESSIE BROWN, creamy-white; CAROLINE TESTOUT, clear rose, large and double, one of the best; COUNTESS OF CALEDON, pale rose, with deeper centre; DANMARK, a double LA FRANCE; GLOIRE LYONNAISE, lemon-white, exquisite as a bud; KAISERIN AUGUSTA VICTORIA, white, deeper centre; LA FRAICTEUR, white, shaded and tinted with rose; L'INNOCENCE, pure white, large and free; MADAME J. FINGER, creamy-white, shaded pink; MARQUISE LITTA, carmine, with vermilion-red centre; SOUVENIR DE PRESIDENT CARNOT, light rose, suffused white.

Noisette Roses.

Varieties of this section should only be closely pruned when they are intended to produce extra large blossoms. In other cases, if the weak and exhausted wood be removed, this will suffice.

ADELAIDE VIVIAND MOREL, canary-yellow, edged rose-carmine; BOUQUET D'OR, deep yellow, coppery centre; COQUETTE DES BLANCHES, pure white, very fine; DUCHESS OF MECKLENBERG, pale yellow; FELLENBERG, bright crimson; FORTUNE'S YELLOW, yellow, flaked carmine, semi-double; L'IDEAL, yellow, tinted copper and gold, very fine; MADAME ALFRED CARRIERE, creamy-white, large and full, vigorous; MADAME PIERRE COCHET, orange- or apricot-yellow.

Bourbon Roses.

The shoots should practically be left their entire length.

ACIDALIE, white, tinted rose; BARDOU JOB, bright scarlet, semi-double; BARONNE GONELLA, rose, with pink shading; J. B. M. CAMM, salmon-pink; LORNA DOONE, magenta-carmine; MRS. PAUL, blush-white, tinged rose, fragrant; PRINCESS LOUISE VICTORIA, pale pink, fine; QUEEN OF BEDDERS, deep crimson; QUEEN OF THE BOURBONS, fawn-coloured salmon; SIR JOSEPH PAXTON, pinkish-rose, free.

Luciæ (Wichuraiana) Hybrids.

A slight shortening is all that is called for, as they are, as a rule, more or less, creeping Roses.

EVERGREEN GEM, buff, changing to white; GARDENIA, bright yellow, becoming cream; JERSEY BEAUTY, pale yellow, large, single; MANDA'S TRIUMPH, pure white, double, in clusters; MAY QUEEN, coral-pink, climber; PINK ROAMER, bright pink, with orange-red anthers, single; RUBY QUEEN, bright carmine, with white base; SOUTH ORANGE PERFECTION, white, tipped pink; UNIVERSAL FAVOURITE, pink, double, very sweet; VARIEGATA, leaves spotted and tipped with white.

Lord Penzance's Hybrid Sweet-Briars.

These do not need any pruning.

AMY ROBSART, deep rose, robust and free; ANNE OF GEIERSTEIN, dark crimson, succeeded by pretty fruits; BRENDA, peach-pink; CATHERINE LEYTON, rose-pink, with golden anthers; EDITH BELLENDEN, pale rose, profuse; FLORA M'IVOR, pure white, tinged rose; JEANNIE DEANS, scarlet-crimson; JULIA MANNERING, porcelain-pink; LADY PENZANCE, copper-tinted, yellow at base; LORD PENZANCE, fawn, with golden centre; LUCY ASHTON, white, edged pink; MEG MERRILEES, bright crimson, free; ROSE BRADWARDINE, clear rose, vigorous.

Rosa—*continued.*

Moss Roses (*R. centifolia muscosa*).

These, like the **Provence Roses** *(which see), require to be closely pruned.*

ANGELIQUE QUETIER, pale lilac-rose, free; BLANCHE MOREAU, pure white, large, and distinct, one of the best; CELINA, rich crimson, shaded purple; CRESTED, bright rose, large and full; CRIMSON GLOBE, deep crimson; CUMBERLAND BELLE, bright silvery-rose (climber); GRACILIS, rose-pink, very mossy; JULIE DE MERSAUT, rosy-pink; REINE BLANCHE, pure white, good variety; WE ZAIR, soft rose.

FIG. 656. YORK AND LANCASTER ROSES.

Provence Roses—Cabbage and York and Lancaster (Fig. 656) (*Rosa centifolia*).

CELESTIAL, light blush; COMMANDANT BEAUREPAIRE, rose, with purple and white stripes; MAIDEN'S BLUSH, light blush; ROSA MUNDI, cherry-red and white; SANCTA (Holy Rose of Abyssinia), pale pink; TUSCANY, dark violet-red.

Polyantha Roses (*Rosa polyantha*).

Alike under glass and in the open the Dwarf varieties should have the shoots cut down nearly to their base after flowering. They are excellent Roses for edgings to beds and borders. The Climbers should have the exhausted wood removed after flowering; while all congested shoots should be cut away at the same time.

Dwarf: ANNA MARIA DE MONTRAVEL, white, double, fragrant; BLANCHE REBATEL, bright crimson, lighter in centre; CECILE BRUNNER, pale pink, pretty; CLOTHILDE SOUPERT, pure white, with pink centre, double; ETOILE D'OR, lemon-yellow, with paler outer petals; GEORGES PERNET, rose, with yellow shading; GLOIRE DES POLYANTHA, bright pink, white centre; GOLDEN FAIRY, buff-yellow; LITTLE DOT, pink, flecked with carmine; MA PAQUERETTE, pure white; PERLE D'OR, nankeen-yellow, with orange centre; PERLE DES ROUGES, bright crimson; RED PET, dark crimson; WHITE PET, white, free. *Climbing*: AGLAIA, canary-yellow; CLAIRE JACQUIER, nankeen-yellow; CRIMSON RAMBLER, bright crimson, strong; ELECTRA, yellow; EUPHROSYNE, pink, with white centre; GRANDIFLORA, pure white; LEUCHSTERN (see Fig. 657), bright rose, with large white eye; PSYCHE, rosy-pink, with salmon-yellow suffusions at base of petal; PURPLE EAST, rosy-carmine and bright purple, semi-double; SIMPLEX, pure white, single; THALIA, white, semi-double; THE LION, rich crimson, large, single; WALLFLOWER, crimson-scarlet.

Rosa—*continued.*

Evergreen Roses (*R. sempervirens*).

In these varieties a number of the hanging shoots are best left nearly their full length, just removing the tips. The weak and exhausted wood in the head should, however, all be cut out. These make pretty Weeping Roses.

DONNA MARIA, white, small; JAUNATRE, fawn-yellow; LEOPOLDINE D'ORLEANS, white, shaded rose, small, double; MYRIANTHES RENONCULE, blush, edged rose-pink; PRINCESS LOUISE, light pink; RAMPANTE, pure white; RUSSELLIANA, dull crimson, excellent pillar Rose.

Ayrshire Roses (*Rosa repens hybrida*).

These useful Roses for banks, trees, arches, and the like, require little or no pruning—just the weak wood cut out and the tips of the other shoots shortened.

ALICE GRAY, creamy-white, edged pink, good arch Rose; QUEEN, purple; QUEEN OF THE BELGIANS, pure white; THE GARLAND, nankeen and pink, becoming white.

Musk Roses (*R. moschata*).

Pruning consists in the removal of useless wood, and a slight shortening back of the vigorous shoots.

FRINGED MUSK, white, with serrated petals; PRINCESSE DE NASSAU, cream, becoming white, double, late-flowering; RIVERS' MUSK, light pink, shaded buff, double.

Ramanas Roses (*R. rugosa*).

These beautiful Hedge Roses require no pruning beyond the shortening back of a rampant growth.

ALBA, pure white, single; AMERICA, crimson-lake, large, and open; ATROPURPUREA, dark crimson; BLANCHE DOUBLE DE COUBERT, pure white, semi-double, lovely in autumn; CALOCARPA, soft rose, followed by pretty fruits; CONSUL F. MEYER, silvery-rose, large, double; CORUSCANS, clear pink, distinct; FIMBRIATA, pale rose or white, fimbriated; MADAME CHARLES WORTH, reddish-purple, semi-double, vigorous; MADAME GEORGES BRUANT, white, double, fragrant; MIKADO, crimson, semi-double, distinct; MRS. ANTHONY WATERER, deep red, large, semi-double, free; ROSE APPLES, silvery-rose and pretty fruits; SOUVENIR DE CHRISTOPHE COCHET, pink, semi-double, large fruits; THUSNELDA, salmon-pink, semi-double, early.

Macartney Roses (*R. bracteata*).

Very little pruning is called for where these tender but beautiful Roses are grown. They should receive the shelter of a south wall.

ALBA SIMPLEX, white, single, fine, open flower; BERBERIFOLIA HARDII, yellow, maroon-spotted, single; MARIE LEONIDA, white, centre creamy-blush, large, double.

FIG. 657. RAMBLING ROSE LEUCHSTERN.

Chinese, or "Monthly" Roses (*R. indica, R. semperflorens*).

The growth of these should be regulated in October, and the slight shortening back necessary is best done in April. They are sun-lovers.

ABBÉ MIOLAN, deep purple, sometimes striped with white, free; ARCHDUKE CHARLES, rose, changing to crimson; AURORE, orange-yellow, shaded fawn, dwarf; CLIMBING CRAMOISIE SUPÉRIEURE; CLIMBING WHITE PET; CORA, lemon-yellow, edged with carmine-rose, dwarf; CRAMOISIE SUPÉRIEURE, deep

Rosa—*continued.*

crimson, very beautiful; DUCHER, pure white, vigorous, of good habit; DUKE OF YORK, variable as to colour, from crimson to white; FELLENBERG, bright crimson, very free, good bedder; IRENE WATTS, salmon-white, changing to pink; JEAN BACH SISLEY, silvery-pink and carmine; LAURETTE MESSIMY,

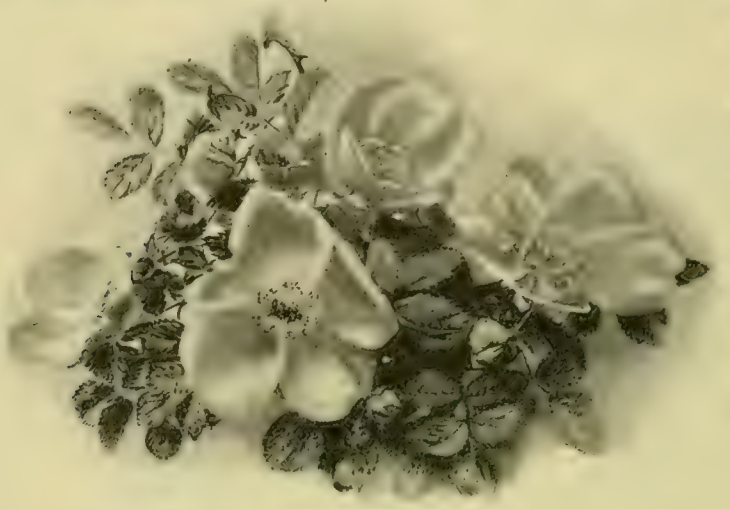


FIG. 653. ROSE AUSTRIAN YELLOW.

rose, with yellow shadings; MADAME EUGÈNE RESAL, pink, shaded orange, free; MISS WILLMOTT, bright coppery-yellow; single; MRS. BOSANQUET, pale waxy flesh, nearly white, fine for bedding; OLD BLUSH MONTHLY ROSE; QUEEN MAB, apricot-yellow, shaded orange and rose-pink; VIRIDIFLORA, a green variety, in which the petals and stamens are modified wholly or in part into bracts.

Austrian Briar Roses (*R. lutea*, Fig. 653).

These need to be given a sunny position, and to have their shoots left practically entire, but bent down. Weak wood should be thinned out.

SOLEIL D'OR, deep golden-yellow when open, 2in. to 3in. across, of vigorous constitution and quite hardy.

Boursault Roses (*R. alpina*).

All weak and exhausted wood should be removed after flowering, and the tips shortened in spring. Good Roses for rough places; succeeding almost anywhere, in country or in town.

BLUSH, blush-white, very large; ELEGANS, crimson, large, semi-double; MORLETII, light rose, large, semi-double.

Microphylla Roses (*R. microphylla*).

Just the points of the shoots should be removed in spring, and the weak wood in autumn.

MA SURPRISE, rose, suffused white, large, double; RUBRA PLENA, deep red, curious, large and full; SIMPLEX, pinkish-white, single.

Scotch Roses (*Rosa spinosissima*, Fig. 659).

No pruning is necessary.

These are found in a variety of colours—white, cream, yellow, pink, rose, and crimson. Then there is also the Perpetual Scotch Rose, STANWELL PERPETUAL, a pretty flesh-pink.

ROSCOEA. To the species described on p. 326, Vol. III., the following variety should be added. *See also* **Cautleya.**

R. purpurea sikkimensis (Sikkim). This is "supposed to differ from the type in the stem and roots, and also in the shade of purple of the flowers." India, 1890.

ROSE OF HEAVEN. *See* **Lychnis Cœli-rosa.**

ROSE RUST. *See* **Rosa—Fungi.**

ROSE SCALE. *See* **Scale Insects.**

ROSE-LEAF MILDEW (*Sphærotheca pannosa*). *See* **Rosa—Fungi.**

ROSELLINEA QUERCINA. *See* **Oak Fungi,** in present Volume.

ROTTLERA (of Roxburgh). A synonym of **Mallotus** (which *see*).

ROUGH LEAVES. A gardener's name for the first leaves produced after the cotyledons.

ROUHAMON. A synonym of **Strychnos** (which *see*).

ROUPALA. To the species described on p. 329, Vol. III., the following should be added:

R. aurea (golden).* A very elegant species, having the upper parts of the stem and the petioles covered with golden hair. St. Catherine's Island, 1866.

R. Poortmanni (Poortmann's). *fl.* red, disposed in spikes. *l.* very variable in the adult stage, and covered with a reddish-brown felt. Habitat not recorded, 1883.

ROUPELLIA. According to modern authorities, *R. grata* is the only species of this genus.

ROVE BEETLES. *See* **Staphylinidæ.**

ROYAL BAY. *See* **Laurus nobilis.**

ROYDSIA (named by Dr. Roxburgh in honour of Sir John Royds, "one of the Puisne Judges of the Supreme Court of Judicature of Bengal, and an eminent benefactor to the Science"). ORD. *Capparideæ*. A small genus (two species) of stove shrubs, natives of the East Indies and the Philippine Islands. Flowers yellow, small, fragrant, axillary and in terminal panicles; sepals six, coloured, imbricated or sub-valvate; petals none; torus short; stamens very numerous;

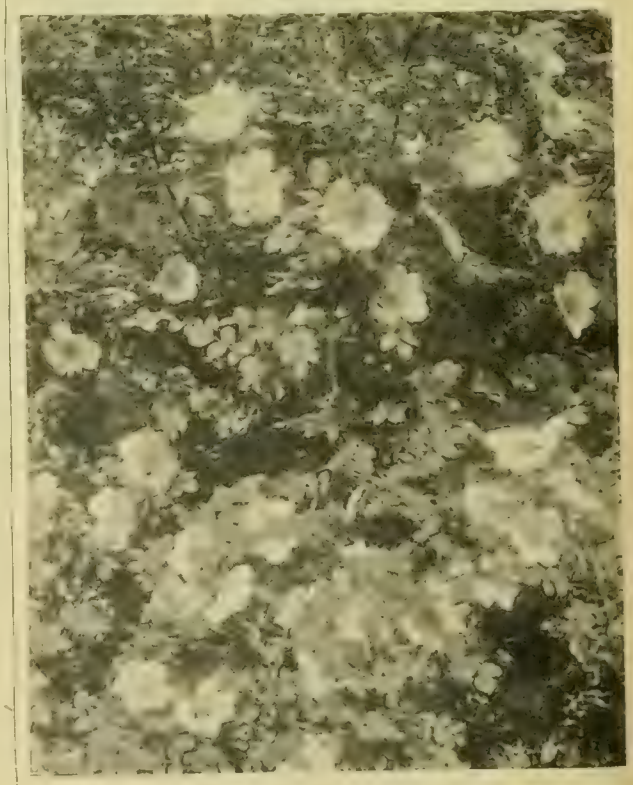


FIG. 659. ROSA SPINOSISSIMA.

Roydsia—*continued.*

pedicels bibracteate at base. Fruit red, olive-shaped. Leaves ample, shortly petiolate, simple, oblong, exstipulate. *R. suaveolens*, the only species introduced, is a rather coarse, rambling bush, well worth cultivating for its delicious fragrance by those who can give it space enough: it is not suited for small houses. The plant thrives in good, rich, loamy soil, and may be readily increased by cuttings of the young wood.

R. suaveolens (sweet-scented). *fl.* numerous, ¾in. in diameter, fragrant; stamens about 100, spreading; racemes axillary, or rather above the axils, 3in. to 7in. long, solitary or in terminal panicles. January to May. *fr.* 1in. to 1½in long. *l.* alternate, 4in. to 12in. long, oblong or oblong-lanceolate, rarely oblanceolate, acute or acuminate, entire, shining, pale beneath; petioles ¼in. to ½in. long. East Indies. (B. M. 6831.)

RUBENTIA. Included under **Elæodendron** (which *see*).

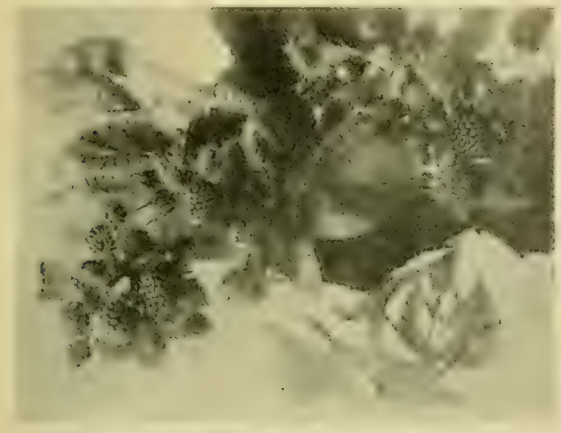


FIG. 660. RUBUS PHŒNICOLASIUS.

RUBUS. To the species, &c., described on pp. 331-2, Vol. III., the following should be added:

R. americanus (American). A garden synonym of *R. villosus.*

R. coronarius (crowned). A variety of *R. rosæfolius.*

R. deliciosus. The flowers of this species are snow-white, not red.

R. fruticosus. Of this species there are several beautiful double-flowered varieties, both white and pink.

R. f. cæsius turkestanicus (Turkestan). *fl.* having small and very narrow petals. *fr.* elongated, of good flavour. Turkestan, 1892. (R. G. 1892, p. 106, f. 25.)

R. japonicus tricolor (Japanese, three-coloured). *l.* simple, three-lobed, toothed; young ones pink; older ones variegated with white; petioles (and stems) rose-coloured. Japan, 1894. (G. C. 1894, xvi., p. 96, f. 15.)

R. lasiostylus (woolly-styled). *fl.*, petals blood-red, orbicular-spathulate, about half as long as the recurved sepals; pedicels red; corymbs few-flowered, sub-terminal; style woolly. June. *l.* pinnate, 3in. to 5in. long; leaflets three to five, doubly serrated, white-tomentose beneath, the young ones suffused with red. Shoots 4ft. high, erect, ½in. thick; prickles slightly curved. China, 1839. (B. M. 7426.)

R. leucodermis (white-skinned).* *fl.* white; peduncles axillary and terminal, few-flowered. *fr.* pale pink, large, with a whitish bloom. *l.* trifoliolate or sometimes pedately five-foliolate; leaflets broadly ovate, incised-serrated, acute, canescently tomentose beneath. Stems glaucous, armed with strong, recurved prickles. Oregon and California. A pretty species.

R. melanolasius (dark-woolly). This is described as a species similar to the Raspberry (*R. Idæus*). North-west America, 1894.

R. Millspaughi (Millspaugh's). "A spineless Bramble, with edible fruits." North America, 1892.

R. moluccanus (Moluccan). The correct name of *R. reflexus.*

R. pauciflorus (few-flowered). A form of *R. lasiocarpus.*

R. phœnicolasius. Japanese Wineberry. The scarlet fruits of this variety are not only ornamental but very useful for culinary purposes. They are not sweet enough for dessert, but make excellent jam, and they come in just after Raspberries are over. The plant does best in a dry, sunny position. See Fig. 660.

Rubus—*continued.*

R. reflexus. The correct name is *R. moluccanus.*

R. rosæfolius flore-pleno (double-flowered). A synonym of *R. r. coronarius.*

R. sinensis (Chinese). A synonym of *R. rosæfolius coronarius.*

R. sorbifolius (Sorbus-leaved). A synonym of *R. rosæfolius.*

R. trifidus (thrice-cleft). *fl.* rose-coloured, showy, fascicled. *l.* large, deeply cordate-trilobed; lobes incised, unequally serrated. Stems flexuous, erect, glabrous, unarmed. Japan, 1833.

R. trivialis (trivial). *fl.* large, one to three to a peduncle. March to May. *fr.* black, large. *l.* persistent, trifoliolate or pedately five-foliolate; leaflets ovate-oblong or almost lanceolate, sharply serrated, nearly glabrous. North America, 1839.

R. ursinus (bear's). *fl.* white, in small corymbs. *fr.* black. *l.* with three, or rarely five, ovate or elliptic, variously toothed, more or less tomentose leaflets; uppermost leaves often simple. Stems rather weak and trailing, armed with rather slender prickles. California, 1888.

R. xanthocarpus (yellow-fruited). *fl.* white, solitary or in pairs in the axils of the upper leaves. *fr.* yellow. *h.* 8in. to 15in. North China, 1892.

RUBY TIGER MOTH. *See* **Tiger Moths.**

RUDBECKIA. **Echinacea** (which *see*) and *Lepachys* were formerly included under this genus, but are now kept distinct. To the species described on pp. 332-3, Vol. III., the following should be added:

R. amplexicaulis (stem-clasping). *fl.-heads*, ray florets yellow, oblong, ½in. or more in length; disk (cone) brownish. July. *l.* one-ribbed, reticulate-veiny, entire or sparingly serrated; lower ones oblong-spathulate, sessile by a tapering base. *h.* 1ft. to 2ft. 1793. A glabrous, somewhat glaucous annual. SYN. *Dracopis amplexicaulis* (B. M. 3716).

R. californica (Californian).* *fl.-heads* solitary; ray florets few, pure golden-yellow, ½in. to 2½in. long; disk brown, short-oblong to cylindrical. July to September. *l.* ovate to oblong-lanceolate; upper ones sessile by a narrow base, more or less toothed, sometimes two-lobed at apex. Stem simple, 4ft. to 6ft. high. 1891. A noble species.

R. columnaris. The correct name is *Lepachys columnaris.*

R. c. pulcherrima (very pretty).* This differs from the type in having a part of, or even the whole of, the upper face of the ray florets brownish-purple. SYN. *Obeliscaria pulcherrima* (of De Candolle).

R. Drummondii (Drummond's). *fl.-heads*, ray florets bright orange, deeply stained with dark brown at base, oblong, obtuse, recurved; cone green. July and August. *l.* pinnate; lobes linear-lanceolate, slightly jagged, acute. Stems numerous, slender. *h.* 1½ft. to 2ft. 1836. (P. M. B. vi., p. 51.) SYN. *Obeliscaria pulcherrima* (of gardens).

R. laciniata (torn). *fl.-heads* large; ray florets few or several, oblanceolate, soon drooping; disk greenish. Summer. *l.* broad, serrated; radical ones pinnately five- to seven-foliolate or nearly so, the divisions often laciniately twice- or thrice-cleft; lower cauline ones three- to five-parted, the upper ones thrice-cleft, those of the branches few-toothed or entire. Stem 2ft. to 7ft. high. 1640.

R. l. grandiflora (large-flowered). *fl.-heads* clear yellow. *h.* 5ft. to 6ft. Autumn.

R. nitida (shining).* *fl.-heads* golden-yellow, smaller, but more regular and plentiful, and with broader ray florets, than in *R. laciniata* (which this species resembles). Late summer. *l.* less incised. *h.* 2ft. to 6ft. or more (under good cultivation). A robust and handsome species.

R. pallida is synonymous with *Echinacea angustifolia.*

R. pinnata. The correct name is *Lepachys pinnatifida.*

R. purpurea. The correct name is *Echinacea purpurea.*

R. subtomentosa (slightly tomentose). *fl.-heads* showing hardly any raised disk; ray florets golden, numerous, 1in. to 1½in. long; disk black. Early and late summer. *l.* nearly all petiolate, ovate, acutely serrated, or the terminal lobe ovate and the lateral ones oblong or lanceolate. *h.* 2ft. to 5ft. Plant cinereous with soft pubescence.

Varieties. There are two especially good varieties in Autumn Glory, with golden-yellow flower-heads and bronzy disk; and Golden Glow, a beautiful double-flowered variety of *R. laciniata.*

RUDGEA. To the species described on p. 333, Vol. III., the following should be added:

R. nivosa (snowy). *fl.* snow-white, few, imperfectly cymose; corolla tube 1in. or more in length, the five limb segments having a horn-like process below the apex. *l.* shining above, whitish beneath, resembling those of *Prunus Laurocerasus.* Stem erect, cylindrical. Brazil, 1866. SYN. *Psychotria nivosa.*

RUE ANEMONE. *See* **Thalictrum anemonoides.**

RUELLIA. Including *Stemonacanthus*. To the species described on pp. 333-4, Vol. III., the following should be added. Several plants formerly included hereunder are now referred to **Aphelandra, Asystasia, Crossandra, Hemigraphis, Hygrophila, Petalidium,** and **Strobilanthes.**

R. ciliosa (ciliated). *fl.* blue, often 2in. long; corolla tube usually twice as long as the calyx and as the limb with the obconical throat. July. *l.* oblong or the lower ones oval (1in. to 2in. long), almost sessile. Stems sometimes flowering when 2in. to 3in. high. North America, 1824. A very variable, hardy perennial, usually clothed with long, spreading hairs, especially the filiform calyx lobes. SYN. *Dipteracanthus ciliosus.*

R. latebrosa. The correct name is *Hemigraphis latebrosa.*

R. Makoyana (Makoy's). *fl.* carmine-rose, large. *l.* olive-green, shaded with violet and veined with white on the upper surface; under-surface vinous-purple. Brazil, 1895.

R. Pearcei (Pearce's). *fl.*, corolla scarlet, 2in. to 2½in. long, erect, with recurved or revolute lobes; peduncles axillary, spreading, few-flowered. *l.* shortly petiolate, 5in. to 6in. long, lanceolate, long-acuminate, obtusely serrated, brownish-purple beneath. Bolivia, 1867. An erect, glabrous under-shrub. SYN. *Stemonacanthus Pearcei* (B. M. 5643).

RUFESCENT. Somewhat Rufous.

RUINS. *See* **Landscape Gardening.**

RUN. Plants which do not stand drought well, or are growing in poor or thin soil, and quickly form seed-stems—such as Lettuce, Radish, Turnip, Cauliflower, &c. —are said by gardeners to Run, or "bolt." The best preventive is a deeply-worked, fertile soil and ample moisture at the roots.

RUPALA. *See* **Roupala.**

RUSCUS. The correct name of *R. racemosus* is *Danaë Laurus.*

RUSH BROOM. *See* **Spartium junceum** and **Viminaria.**

RUSINA. *See* **Noctua.**

RUSSELIA. *R. Lemoinei* is the name given to a garden hybrid that has been raised on the Continent between *R. juncea* and *R. sarmentosa* (1897).

RUTA. *R. bracteosa* is now classed as a form of *R. chalepensis.*

RYMIA. A synonym of **Euclea** (which *see*).

RYTIDOPHYLLUM. *See* **Rhytidophyllum.**

SABAL. In addition to the species described on p. 338, Vol. III., the following are grown in botanical establishments: *S. filamentosa, S. glaucescens, S. major, S. mexicana,* and *S. Sanfordi. S. minor* is a synonym of *S. Adansoni.*

SABICEA. *S. hirta* is now regarded as merely a form of *S. aspera.*

SACCHARUM. According to the "Index Kewensis," *S. spontaneum* and *S. arundinaceum* are the correct names of *S. ægyptiacum* and *S. procerum* respectively; and *S. sinense* is merely a form of *S. officinarum.*

SACCIA (named in honour of Dr. Sace, agricultural chemist, of Cochabamba). ORD. *Convolvulaceæ.* A doubtful genus, founded by M. Naudin. The only species, *S. elegans,* is very interesting, considering the natural order, as being of tree-like habit. It will probably thrive under the treatment recommended for the tender species of **Convolvulus.**

S. elegans (elegant). *fl.* lilac, of medium size, disposed in axillary racemes near the ends of the branches. *h.* 3ft. or more. Cochabamba, Bolivia, 1889.

SACCOLABIUM. Including *Gastrochilus* (of Don). To the species and varieties described on pp. 340-1, Vol. III., the following should be added. *See also* **Acampe.**

S. ampullaceum is the correct name of the plant described in Vol. III. as *S. rubrum.*

S. Barbeyæ (Mme. Barbey's). This is identical with *Angræcum imbricatum.*

S. bivittatum (twice-striped). *fl.* small, disposed in a lax, drooping spike; sepals and petals yellowish, with two purplish-brown stripes; lip white, nearly as long as the sepals. *l.* strap-shaped, leathery. East Indies, 1890.

Saccolabium—*continued.*

S. calceolare (slipper-like). *fl.* yellow or greenish, speckled, barred or blotched with reddish-brown, ¼in. to ⅜in. across; lip white or yellow, red-speckled; peduncle ¼in. to 1½in long. *l.* bilobed or cleft, 4in. to 5in long. India.

S. cerinum (wax-like). *fl.* orange-coloured, waxy in texture, with an apricot-coloured spur, numerous, ascending, racemose. April. *l.* dark, ligulate, bilobed. Malay Archipelago, 1838.

S. cœleste is a synonym of *Rhynchostylis cœlestis.*

S. garwalicum is synonymous with *Rhynchostylis retusa.*

S. giganteum is classed under Vanda (*V. densiflora*) by Hooker, in the "Flora of British India."

S. g. Petotianum (Petot's). *fl.* dull white, large and rigid. Cochin China, 1885.

S. g. Regnieri (Regnier's). A variety with flowers 1¼in. across. 1889.

S. hainanense (Hainan). *fl.* white and purple, small, numerous, disposed in a panicle 6in. long. *l.* lanceolate-linear, 2½in. long. Hainan, 1895.

S. longicalcaratum (long-spurred). *fl.* pinkish-purple, small, many in a raceme 6in. long. *l.* 4in. long, 1½in. broad. Birma, 1894.

S. miniatum (of Hooker). A synonym of *S. curvifolium.*

S. Mooreanum (Moore's). *fl.* pink, with green tips, small, disposed in a crowded, short raceme; scape 8in. long. *l.* 6in. long, 1½in. broad. New Guinea, 1893. (B. M. 7428.)

S. papillosum is now removed to *Acampe.*

S. Pechei (Peche's). *fl.*, sepals and petals ochre, with red spots, cuneate-oblong, blunt-acute; lip forming a cupular spur, having a few red spots at the yellow base of the spur, the side laciniæ retuse and angular over the transversely triangular, nearly white mid-lacinia; raceme few-flowered. *l.* broadly ligulate, blunt, bilobed at apex, 7in. long, nearly 2in. broad. Moulmein, 1887. (G. C. 1837, f. 447.)

S. retusum is synonymous with *Rhynchostylis retusa.*

S. Smeeanum (Smee's). *fl.*, sepals and petals greenish-white, with mauve mid-veins, becoming whitish-ochre with brown-purple stripes, the sepals oblong-ligulate, the petals nearly so; lip white, becoming yellow, the disk of the oblong, acute mid-lacinia mauve, turning brown, the side laciniæ very small; peduncles bifid, each branch closely racemose. 1837.

S. speciosum is a synonym of *Aerides maculosum.*

S. Wightianum (Wight's), of Lindley. A synonym of *Aerides radicosum.*

S. geminatum, S. lanatum, and *S. micranthum* are in cultivation in botanical collections.

SAC FUNGI. *See* **Ascomycetes.**

SADLERIA. *S. cyatheoides* is a vigorous grower, requiring no special care, and thriving under warm treatment, in a mixture of two parts peat, one part loam, and one part silver-sand, with abundance of moisture at all times of the year. It is usually propagated by means of spores, received from its native habitats, none of the cultivated plants having as yet shown signs of fructification.

SAGINA. To the species described on p. 342, Vol. III., the following should be added:

S. procumbens (procumbent). *fl.* white, solitary, star-like; sepals, stamens, and petals four or five; petals about half as long as the sepals. May to August. *l.* small, linear, mucronate. Stems 2in. to 6in. long. Europe (Britain), &c. A pretty, annual or perennial alpine, forming little, spreading tufts.

S. subulata (awl-shaped). The correct name of *S. pilifera.* SYN. *Spergula pilifera.*

SAGITTARIA. *S. variabilis* is now regarded as a form of *S. sagittifolia* (Water Archer). *S. japonica* is another form of it, with double flowers. *S. obtusifolia* is a synonym of *Limnophytum obtusifolium.* We give an illustration of the beautiful *S. montevidensis* (described in Vol. III.) at Fig. 661.

SAGO PALM. *See* **Metroxylon.**

SAGRÆA. To the species described on p. 343, Vol. III., the following should be added:

S. hirsuta. The correct name is *Ossæa hirsuta.*

S. pilosa (hairy). *fl.* disposed in an axillary, racemose panicle; petals whitish, spotted at base, small. *fr.* red, prickly. *l.* petiolate, oblong, acute, five-nerved, glabrous above, pilose-hairy beneath, especially on the nerves; petioles (as well as the peduncles and branches) rusty-hairy. West Indies.

ST. BERNARD'S LILY. *See* **Anthericum Liliago.**

ST. BRUNO'S LILY. *See* **Anthericum Liliastrum.**

ST. MARK'S FLY (*Bibio Marci*). A common dipterous insect, whose larva is credited with some damage to the roots of corn and grass. The larvæ somewhat resemble spiny caterpillars, and have a very hard head. Feeding as they do at the roots of plants, they are not readily reached. The popular name has been bestowed because of the appearance of the flies about St. Mark's Day. The colour differs considerably in the two sexes, the male being black and the female yellowish.

SAINTPAULIA (named in honour of Baron Walter von Saint Paul, the discoverer of the plant). ORD. *Gesneraceæ*. A monotypic genus. The species is a charming, stove, stemless, hairy-pubescent perennial, with the habit of *Ramondia pyrenaica*. It is easily raised from seed, sown as described for *Begonia*. If sown in March, the plants will flower profusely in August.

S. ionantha (violet-flowered).* *fl.* nodding, cymose, on stout peduncles; corolla violet-blue, sub-rotate, bilabiate, 1in. across, the upper lip two-lobed and much the smaller. July. *l.* 1½in. to 2in. long, ovate- or oblong-cordate, obtuse, crenate; petioles short and stout. Eastern tropical Africa, 1893. (B. M. 7408; G. C. 1893, i., f. 104; R. G. 1893, f. 103; R. H. 1893, f. 103.) *S. i. grandiflora violacea* is larger and deeper in colour than the type. *S. i. albescens* has white flowers delicately tinted with light blush-pink. *S. i. purpurea* is a very dark variety.

FIG. 661. SAGITTARIA MONTEVIDENSIS.

SALACIA. To the species described on p. 343, Vol. III., the following should be added:

S. scabra (rough). *fl.* green, in axillary and terminal, dichotomous panicles. *fr.* spherical. *l.* ovate-oblong, almost entire, veined and rough on the under-surface. Guiana.

SALADING. In addition to the plants named in Vol. III., p. 343, as suitable for Salads, the following should be named: Celery and Celeriac, Corn Salad, Cucumbers, Dandelion, Nasturtium, Onions, Purslane, Rampion, Salsafy, Shallots, Sorrel, and Watercress, all of which are more or less appreciated.

SALIX. Willows, when well chosen, make most effective pictures in the landscape, especially in winter, when their vari-coloured stems stand out prominently amidst usually sombre surroundings. Later in spring the catkins are also decorative.

To the species and varieties described on pp. 345-7, Vol. III., the following should be added. A number of varieties formerly described as species are mentioned under *S. phylicifolia*.

S. acutifolia is an acute-leaved form of *S. daphnoides*.

S. alba argentea (silvery).* A silvery variety of the beautiful type. SYN. *S. rejalis*.

S. a. britzensis. An ornamental variety, having the young shoots of a purplish-red. 1879. SYN. *S. vitellina britzensis*. There is another variety, *argentea* (silvery).

S. ambigua (ambiguous). *fl.*, catkins shortly stalked or sub-sessile; scales silky-pilose. Late spring. *l.* 1in. to 2in. long, oblong-obovate or -oblanceolate to oblong-elliptic, with a short, recurved point, serrated or nearly entire, rugose, dark green, shining, or glaucous or cottony-hairy beneath. Branches ascending or procumbent. *h.* 1ft. to 3ft. Europe (Britain). (Sy. En. B., t. 1355.) There are three or four varieties.

S. americana pendula (pendulous). A garden name for two distinct kinds of Willow—*S. elegantissima* and *S. purpurea pendula*.

S. amplexicaulis (stem-clasping). A form of *S. pendula*.

S. amygdalina (Almond-like). A form of *S. triandra*.

S. aurita (eared). Round-eared Willow. *fl.*, male catkins closely sessile, but much smaller than in *S. Caprea* (to which this is nearly allied); females ¼in. long when in flower. Early spring. *l.* 1in. to 2in. long, orbicular to oblong, more wrinkled than in *S. Caprea*. Plant more bushy. Europe (Britain), &c.

S. babylonica Salomoni (Salomon's). A graceful and rapid-growing form. Other varieties are *annularis* (Ringlet Willow) and *Napoleona* (Napoleon's Weeping Willow).

S. balsamifera (balsam-bearing). *fl.*, catkins dense, 1in. to 1½in. long, the males very silky, with rosy scales, the females less silky, becoming lax in fruit. *l.* 2in. to 3in. long, 1in. to 1½in. broad, acute or acuminate, broadly rounded or sub-cordate at base, of a rich reddish colour when young, becoming dark green above, paler or glaucous beneath, glabrous. *h.* 4ft. to 10ft. Eastern North America, 1833. Shrub.

S. basfordiana (Basford). A variety of *S. fragilis*.

S. blanda (pleasant). *l.* 3in. to 5in. long and less than 1in. broad. A fine Weeping Willow; it is a hybrid between *S. babylonica* and *S. fragilis*. 1893.

S. candida (white). Hoary Willow. *fl.*, catkins cylindrical, close-flowered, the females 1½in. to 2in. long at maturity. April. *l.* narrow-lanceolate, acuminate or the lowest obtuse, the upper surface and the young branches covered with a thin, web-like wool, which is whiter and denser beneath. Stem 2ft. to 5ft. high; twigs reddish. North America, 1811.

S. chlorophylla (green-leaved). *fl.*, fertile catkins dense, short, cylindrical. *fr.* silky, very short-stalked. *l.* oblong-lanceolate or oblong, mostly entire, obtuse or acutish at apex, 1in. to 2in. long, shining green above, pale or glaucous beneath, coriaceous when old. North America, 1833. A spreading bush, only a few inches high.

S. cinerea is now classed as a species and not as a variety of *S. Caprea*. *S. aquatica*, *S. Medemii*, and *tricolor* are forms of this.

S. cordata (heart-shaped). *fl.*, catkins lateral, appearing with the leaves, leafy at base. May and June. *l.* 2½in. to 6in. long, lanceolate or ovate-lanceolate, cordate, truncate, or even acute at base, acuminate at apex, sharply toothed, smooth, paler beneath; stipules often large, reniform or ovate. North America. A shrub or small tree, of which the following are varieties: *glaucophylla*, *rigida* (*myricoides*), *sericea*, and *vestita*.

S. cuspidata is now accorded specific rank. *See* under **S. pentandra.**

S. elegantissima (most elegant).* Something in the way of *S. babylonica*, having long, pendent branches, often tinged with a russet tint; the habit is more spreading and the crown larger. It is a free grower. SYN. *S. americana pendula* (of gardens).

S. fragilis basfordiana (Basford).* *fl.*, male catkins yellow, 2½in. long, the females 1½in. long. *l.* long, narrow-lanceolate, acute, serrated. Bark of a brilliant orange, passing to red on the terminal twigs. 1882. The female tree is also known as *S. sanguinea*. (G. C. 1882, xvii., 298, f. 41-2, under name of *S. basfordiana*.) The form *latifolia* has broader leaves than the type.

S. gracilistyla (slender-styled).* *fl.*, catkins 1½in. to 3in. long. *l.* bold, broadly lanceolate, thickly nerved. Japan and North China, 1897. A handsome Willow, with crowded, prominent buds.

S. Helix (Helix). A variety of *S. rubra*.

Salix—*continued.*

S. herbacea (herb-like). *fl.*, catkins very small, ovoid. Summer. *l.* obovate or orbicular, above ¼in. long, finely crenate, green, glabrous or sometimes slightly silky-hairy when young. Branches seldom rising above 2in. from the ground. Europe, &c. The smallest of British shrubs. (Sy. En. B., t. 1378.)

S. Hoyeriana (Hoyer's). This is described as "a handsome Weeping Willow, with elliptic leaves 4in. long and 2in. broad" Cascade Mountains, British Columbia, 1889.

S. Humboldtiana (Humboldt's). *fl.*, male catkins golden, 2in. to 3in. long; females often 3in. long; scales fulvescent. *l.* lanceolate-linear, very long-attenuated, argutely denticulate, highly glabrous on both sides, 2in. to 4in. long, one to three lines broad, rather rigid when adult. Andes, 1833. An evergreen, greenhouse tree, of pyramidal habit.

S. H. fastigiata (pyramidal). A variety of pyramidal habit, resembling that of the Lombardy Poplar. *h.* 24ft. to 30ft. Peru, &c., 1896. (R. H. 1896, p. 177, f. 58-60.)

S. Humboldtiana (of gardens). A synonym of *S. pentandra.*

S. incana (hoary). *fl.*, male catkins sessile, about 1in. long, incurved; females 1½in. to 2in. long, rather lax. *l.* often 2in. to 5in. long, one to six lines broad, lanceolate-linear, acuminate, revolute-margined, slightly toothed, woolly-tomentose beneath. Europe, 1821. A shrub, often very large.

S. lanata (woolly).* *fl.*, catkins one to three, bright yellow, terminal, congested, sessile, very hairy, thick, cylindrical, erect, 3in. to 4in. long. Early summer. *l.* sub-cordate-oval or broadly lanceolate, rigidly coriaceous, 1½in. to 3in. long, densely silky white-tomentose on both sides. Arctic Europe (Scottish mountains) and Asia. A much-branched shrub. *Sadleri* is a variety.

S. lasiandra lancifolia (hairy-anthered, lance-leaved). *fl.*, catkins greenish-yellow, about 2in. long, borne on short, lateral shoots. *l.* lanceolate, acuminate, 6in. to 10in. long, finely serrated; stipules reniform. California. (R. G. 1887, pp. 409-10, f. 93.)

S. laurina is regarded as a species by modern botanists. *See* under **S. filicifolia.**

S. Nicholsoni purpurascens (Nicholson's, purplish). *l.* purple when young. 1889. A shrub resembling the Purple Peach; it is probably a natural hybrid, of which *S. nigra* is one of the parents.

S. nigricans (blackish). *fl.*, catkins pedunculate, very long and thick; males oval-oblong; females cylindrical. Spring and early summer. *l.* ¼in. to 5in. long, ¼in. to 2in. broad, lanceolate-ovate, entire or serrated, highly glabrous to densely woolly-tomentose, turning black in drying. Europe (Britain), &c. Allied to *S. phylicifolia* (of which some botanists regard it as a variety), but larger. There are numerous varieties, including *moabitica*, a dwarf form, with finely-fringed leaves. (Sy. En. B., t. 1347-54.)

S. petiolaris (long-petiolate). *fl.*, male catkins sessile, ¼in. long, with blackish scales; females nearly 1in. long. April. *l.* rather rigid, narrow-lanceolate, cuspidate, 3in. to 4in. long, usually ¼in. broad, argutely serrated or entire, glabrous, glaucescent beneath (but at first densely silky); petioles ¼in. to ¼in. long. *h.* 3ft. to 10ft. North America.

S. purpurea pendula (drooping).* American Weeping Willow. *l.* grey, slender. This weeping variety forms a dense head, and thrives in hungry soils and bleak situations. SYN. *S. americana pendula* (of gardens).

S. p. scharfenbergensis (Scharfenberg).* This is even more beautiful than *pendula*; the branches are stained with russet-brown. *amplexicaulis* (stem-clasping) is another variety.

S. regalis (regal). A synonym of *S. alba argentea.*

S. repens. Creeping Willow. *fl.*, catkins cylindrical, usually about ¼in. long, sessile, at length pedunculate and 1in. long. Spring. *l.* oblong or lanceolate, less than 1in. long, rarely shortly ovate, or in luxuriant shoots narrow-oblong and 1½in. long, nearly or quite entire, silky. Europe (Britain) and Asia. A low, straggling shrub. A series of forms of this species is figured in Sy. En. B., t. 1356-62. *S. r. argentea* is one of the best known, though usually under the name of *S. sericea argentea.* SYN. *S. Woolseyana.*

S. reticulata (netted). *fl.*, catkins cylindrical, ¼in. to 1in. long, shortly downy, on rather long, leafless peduncles. Summer. *l.* obovate or orbicular, entire, ¼in. to 1in. long and broad, green, glabrous and much wrinkled above, white below. Europe (Britain), &c. A prostrate, much-branched shrub. (Sy. En. B., t. 1379.)

S. retusa (retuse). *fl.*, catkins erect, rather longer than broad, terminal on lateral, leafy branchlets, appearing late; females ¼in. long, the males shorter. *l.* ¼in. long, very shortly petiolate, oblong-obovate, obtuse or emarginate, entire or minutely serrulated towards the base, long-attenuated at base, shining green. South Europe, 1673. A small shrub, with flabellately creeping branches, and excellent for clothing banks. *S. serpyllifolia* is a much-branched form of this, with leaves about ¼in. long.

Salix—*continued.*

S. rosmarinifolia (Rosemary-leaved).* *fl.*, catkins small, sessile; ovary silky. April. *l.* linear-lanceolate, nearly entire, flat, 1in. to 2in. long, pubescent above, silky beneath; stipules subulate. Branches silky. *h.* 2ft. to 4ft. Europe, North America, &c. A graceful, canescent, bushy shrub.

S. Russelliana is a synonym of *S. fragilis*, not *S. viridis.*

S. Salomoni (Salomon's). A robust form of *S. babylonica.*

S. sanguinea (blood-coloured). A name applied to the female tree of *S. fragilis basfordiana.*

S. scharfenbergensis (Scharfenberg's). A form of *S. pendula.*

S. sericea argentea (silky, silvery). A synonym of *S. repens argentea.*

S. serpyllifolia (Thyme-leaved). A dense form of *S. retusa*, useful for damp banks.

S. Smithiana (Smith's). *fl.*, catkins opening before the leaf-buds expand; males ovate-oblong, sub-sessile; females short, cylindrical. Spring. *l.* oblong-lanceolate or lanceolate-elliptic, acute, slightly undulated, shortly stalked, 3in. to 6in. long, bright green above, greyish-white beneath. Europe (Britain). A bushy shrub. (Sy. En. B., t. 1324.) *acuminata*, *ferruginea*, and *velutina* are varieties.

S. vitellina is sometimes classed as a distinct species, and not as a variety of *S. alba. S. v. pendula* is a pleasing, pendulous form.

S. Woolseyana (Woolsey's). A synonym of *S. repens argentea.*

SALMEA. *S. Eupatoria* is the correct name of *S. scandens* (SYN. *S. grandiceps*).

SALPIANTHUS. A synonym of **Boldoa** (which *see*). *S. purpurascens* is a synonym of *Cryptocarpus globosus.*

SALPICHROA. To the species described on p. 347, Vol. III., the following should be added:

S. rhomboidea (rhomboid). *fl.* white, usually solitary (or twin); corolla short, tubular. *fr.* white. *l.* small, rhomboid-ovate, rounded at base and narrowed to the petioles, nearly glabrous or slightly pubescent, the margins and petioles ciliated. Stem slender. Buenos Ayres. Greenhouse or half-hardy; suitable for trellises. (R. H. 1897, pp. 504, 529, f. 159.)

SALPIGLOSSIS. Owing to the variable colours of the flowers of *S. sinuata*, it is frequently called *S. variabilis. S. linearis* is the correct name of *Petunia intermedia.* The garden hybrids of this genus are very beautiful with their Alströmeria-like flowers, often beautifully pencilled. The following are good: Beauty, Crimson King, New Emperor, Princess Ida, The Moor, and Violet Queen.

SALPINGANTHA. A misprint for *Salpixantha. See* **Geissomeria.**

SALTICUS. *See* **Spiders.**

SALVIA. To the species described on pp. 349-53, Vol. III., the following should be added:

S. brasiliensis (Brazilian). A synonym of *S. splendens.*

S. candidissima (whitest). The correct name of *S. odorata.*

S. coccinea nana (dwarf). A much-branched, bushy variety.

S. c. punicea (reddish). *fl.* of a brighter red, more velvety, and more closely placed than in the type. Plant larger, slenderer, and later-flowering.

S. dichroa is a form of *S. bicolor.*

S. flocculosa verticillata pauciflora (flocculose, whorled, few-flowered). *fl.* of a rich red, with two white spots on the upper lip of the corolla, disposed in terminal spikes. *l.* bright green, lanceolate-ovate, thin, slightly wrinkled. Andes of Quito, 1890. Greenhouse shrub.

S. Horminum bracteis-violaceis (violaceous-bracted). A hardy variety having violaceous bracts.

S. H. purpureum (purple). This form differs from the type in having the floral leaves carmine-rose or bright purple, with darker veins.

S. Hoveyi is a synonym of *S. splendens.*

S. macrostachya (large-spiked). *fl.* blue; corolla 1in. long; whorls many-flowered, forming dense, terminal spikes 6in. to 8in. long. *l.* petiolate, roundish-ovate, 2in. to 5in. long, deeply and irregularly crenate, cordate-auricled at base, villous-pubescent; floral ones persistent. Stems 6ft. or more in height, quadrangular. Peru, Ecuador, &c., 1894. Greenhouse shrub. (B. M. 7372.)

S. mexicana minor (Mexican, lesser). A synonym of *S. discolor.*

S. officinalis tricolor (three-coloured).* *l.* variegated pink and yellowish-white, afterwards turning pink or red. An interesting and decorative variety.

Salvia—*continued.*

S. phœnicea (scarlet).* *fl.* magenta-carmine, 1in. long; whorls remote; the lower ones many-flowered, the upper ones depauperate; raceme long, glandular-hispid. *l.* petiolate, ovate or oblong, slightly serrated, crenate, rounded or sub-cordate at base, glabrous or puberulous; floral ones persistent. Stems erect, 4ft. high. Ecuador, 1890. A pretty, greenhouse shrub.

S. prunelloides purpurea (purple). A variety having purplish-red flowers. 1890.

S. pseudo-coccinea (false *coccinea*). A form of *S. coccinea*.

S. purpurea (purple).* *fl.* purple; corolla nearly thrice as long as the densely woolly calyx; whorls many-flowered, approximate, secund. June. *l.* petiolate, ovate, acuminate, serrated, rounded or cordate at base, glabrous or hoary-pubescent; floral ones small, acuminate. *h.* 2ft. Mexico, 1821. Greenhouse perennial.

S. scapiformis (scape-formed). *fl.*, calyx ½in. long; corolla pale amethystine-blue, the limb ¾in. in diameter; whorls numerous; scapes 6in. to 10in. high, ascending. June. *l.* all radical (rarely with an opposite pair towards the base of one or more of the scapes), 2in. long, spreading, broadly ovate- or oblong-cordate, obtuse, coarsely crenate or lobulate, reddish-purple beneath. China, &c. Greenhouse perennial. (B. M. 6980.)

S. Schiedeana (Schiede's). *fl.* blue, disposed in a spike 6in. long. *l.* ovate, crenate, 3in. long. Stems hairy, 1ft. high. Mexico, 1896. Hardy.

S. splendens grandiflora (large-flowered). A variety having large and bright red flowers. There are also several good garden forms, like ROSE BEAUTY and SILVERSPOT.

S. sylvestris (wood-loving). *fl.* purplish-violet, disposed in elongated, somewhat branched racemes; lower whorls often ½in. distant. August. *l.* 2in. to 4in. long; lower ones petiolate; upper ones sessile; all oblong-lanceolate, crenate, rounded or cordate at base, paler, pubescent or hoary beneath. Stem 6in. to 3ft. high, paniculate. Orient, &c., 1759. Hardy perennial. There is also a white variety, *alba*.

S. yunnanensis (Yunnan). *fl.* cobalt-blue, large. *l.* resembling those of *S. scapiformis*. China, 1896. Hardy.

SALVINIA. According to J. G. Baker ("Handbook of the Fern-Allies") this genus embraces thirteen species, natives of warm regions. *S. natans* is the best-known.

SAMARA (of Linnæus). A synonym of **Embelia** (which *see*).

SAMBUCUS. To the species and varieties described on p. 354, Vol. III., the following should be added:

S. cærulea (blue). *fl.* in compound, depressed, five-rayed cymes. *fr.* blackish, but strongly whitened with a glaucous, mealy bloom, larger than in *S. canadensis*. *l.*, leaflets five to nine, thickish, ovate to narrowly oblong; lower ones rarely three-parted. *h.* 6ft. to 18ft. Western North America. This arborescent species fruits when very young. SYN. *S. glauca*.

S. Gautschii (Gautsch's). This is apparently a mere form of the Danewort, *S. Ebulus*. 1890.

S. glauca (glaucous). A synonym of *S. cærulea*.

S. nigra pendula nova (pendulous, new). *l.*, leaflets elongated. Branches very long, shortly recurved. 1890. A very singular variety. (R. H. 1891, f. 50.)

S. n. pyramidata (pyramidal). *l.* robust; leaflets numerous, large, elongated, unequal, deeply toothed. Habit narrow-pyramidal. 1884.

S. n. variegata (variegated). *l.* striped with silvery-grey, which colour it unfortunately loses if planted under the shade of tall trees.

S. pubens is now considered to be synonymous with *S. racemosa pubescens*.

S. p. maxima (largest). This is apparently the same as *S. canadensis*.

S. pyramidata (pyramidal). A variety of *S. nigra*.

S. racemosa arborescens (tree-like). In this variety the leaves are larger than in the type, and composed of seven to nine oblong leaflets. Rocky Mountains, 1823.

S. r. heterophylla (variable-leaved). A garden variety, having the leaves simple or composed of three irregularly-formed leaflets. 1891. (R. G. 1891, p. 655, f. 123.)

S. r. laciniata (torn). A form with laciniated leaflets.

S. r. plumosa aurea (golden). A form of the Scarlet-berried Elder having finely-cut, golden leaves. 1896.

S. r. serratifolia (serrate-leaved). *l.* Fern-like, rather narrower than in the form *plumosa*, and not so deeply pinnatifid.

S. r. tenuifolia (slender-leaved).* An attractive variety, of graceful outline.

SAND PEAR. *See* **Pyrus sinensis.**

SANDAL WOOD, FALSE. *See* **Ximenia americana.**

SANDFLY BUSH. *See* **Zieria Smithii.**

SANGUINAIRE-PLANT. *See* **Paronychia argentea.**

SAN JOSE SCALE (*Aspidiotus perniciosus*). *See* **Scale Insects.**

SANSEVIERIA [the correct spelling]. To the species described on p. 356, Vol. III., the following should be added:

S. aureo-variegata (golden-variegated). *l.* oblong-obovate, thick, leathery, pale green in the centre, with two broad bands of creamy-white, and a narrow, pale green margin.

S. javanica (Javanese). A synonym of *Dracæna elliptica*.

S. Kirkii (Kirk's). *fl.* white, forming a densely congested, sub-globose raceme 6in. to 8in. in diameter; tube cylindrical, 4in. to 5in. long; lobes recurved, 1in. long. February. *l.* three or four, oblanceolate, 2ft. to 3ft. long, 3in. broad, obscurely mottled, narrowly bordered with reddish-brown. Rhizome stout. South-east tropical Africa, about 1881. (B. M. 7357.)

S. Roxburghiana (Roxburgh's). *fl.* pale greenish-white, 1in. long, cylindric, in fascicles of three to six; raceme 1ft. to 1½ft. long, cylindrical. July. *l.* eight or nine, 2ft. to 2½ft. long, 1in. broad, dagger-formed, concave above, pale green fasciated with darker green, narrowly red-bordered. Stem very short. East Indies, 1895. (B. M. 7487.)

S. subspicata (somewhat spicate). *fl.* whitish, all solitary, in a dense, sub-spicate inflorescence; perianth 2in. long. October. *l.* pale, unspotted, oblanceolate, nearly flat, 8in. to 9in. long, gradually narrowed to the base. South Africa, 1839. Greenhouse.

SANTIA. A synonym of **Polypogon** (which *see*).

SANTOLINA. To the species described on pp. 356-7, Vol. III., the following should be added:

S. alpina (alpine). A synonym of *Anthemis montana*.

S. pectinata (comb-like). *fl.-heads*, involucral scales pubescent. July. *l.* pinnatipartite; lobes six to eight on each side, linear, obtuse, entire, bifid, or trifid. Branches sub-erect, leafless and one-headed at apex. *h.* 2ft. Spain, 1822. Plant very slenderly pubescent.

S. viridis (green). *fl.-heads*, involucral scales lanceolate. Summer. *l.* quadrifarious, toothed; teeth straight, subulate. Branches leafless and one-headed at apex. South Europe. An erect shrub.

SAOUARI NUT. *See* **Caryocar nuciferum.**

SAPINDUS DANURA. A synonym of **Nephelium verticillatum** (which *see*).

SAPLING. A young tree.

SAPONARIA. *S. officinalis flore-pleno* is a good variety, with the stamens transformed into irregular petals.

SAPROPHYTE. A plant which grows on decaying animal or vegetable matter—many of the Fungi and certain flowering plants, those for instance without any green colour.

SARACA. *S. declinata* is the correct name of the plant described on p. 359, Vol. III., as *S. inclinata*.

SARCANTHUS. To the species described on pp. 359-60, Vol. III., the following should be added:

S. auriculatus (auricled). *fl.* greenish-white, lined with purple. Habitat not recorded, 1895. Allied to *S. Parishii*, but differing principally in having a pair of ear-like lobes at the base of the lip.

S. hongkongensis (Hong-kong). *fl.* pale lilac, small, numerous, in axillary racemes 5in. long; column and front of the lip bright purple. *l.* terete, recurved, 4in. long. Stem 1ft. high. Hong-kong, 1898.

S. pugioniformis (dagger-like). *fl.* yellowish-white, with red stripes, small, sessile; spike pendulous, many-flowered, 7in. long. *l.* lanceolate, 8in. long. Stem somewhat compressed, 9in. long. Venezuela, 1894.

SARCOBATUS (from *sarx*, flesh, and *batis*, a bush; in allusion to the fleshy appearance caused by the white bark). Greasewood. SYN. *Fremontia* (of Torrey). ORD. *Chenopodiaceæ*. A monotypic genus. The species, *S. Maximiliani* (SYN. *S. vermiculatus*), is a hardy, erect, branched, thorny, leafy, North American shrub, with white bark, and bearing monœcious or diœcious flowers, without bracts. It is of no particular horticultural value.

SARCOCALYX. A synonym of **Exocarpus** (which *see*).

SARCOCHILUS. To the species described on pp. 360-1, Vol. III., the following should be added:

S. Berkeleyi (Major-Gen. E. S. Berkeley's).* *fl.* creamy-white, with a purple stain on the lip, crowded, 1½in. across vertically; lip clawed, the side lobes falcately linear; racemes pendulous, longer than the leaves. *l.* ligulate, spreading, 5in. to 9in. long, obtuse or emarginate. Stem 3in. to 6in. high. Nicobar Islands, 1891. SYN. *Thrixspermum Berkeleyi* (W. O. A. x., t. 436).

S. borneensis (Bornean). *fl.* yellowish, disposed in a short spike, on a long peduncle; sepals narrow, spreading; petals about 1¼in. long; lip spotted. Borneo, 1892. Habit erect. (I. H. 1892, t. 161.)

S. crassifolius (thick-leaved). *fl.* yellowish, few, small, borne on short scapes. *l.* short, ovate-oblong, fleshy. Stem climbing. Habitat not recorded, 1894.

S. hainanensis (Hainan). *fl.* light yellow, pendent; sepals and petals 1¼in. long; lip shorter; raceme 3in. long, with pectinate bracts. *l.* linear-oblong, 4in. long. Stem slender. Hainan, 1896.

S. indusiatum (covered). *fl.* small, disposed in short, dense racemes; sepals and petals yellowish, spotted red; lip white; spur cylindric, with "a kind of bucket" at its apex. *l.* soft, shining, oblong, 3in. broad. Sunda Isles, 1886. SYN. *Thrixspermum indusiatum.*

S. luniferus (moon-bearing).* *fl.* ½in. across; sepals and petals yellow, spotted with orange-red, obtuse; lip white, saccate, with erect side lobes; racemes drooping, many-flowered; peduncles 1in. to 2in. long. *l.* usually wanting, but sometimes small ones are produced. Moulmein, 1868. (B. M. 7044.) SYN. *Thrixspermum luniferum.*

S. Moorei (Moore's). *fl.* many in a raceme; sepals and petals light yellow, with numerous brown blotches; lip sacciform, with short lobes; peduncle 6in. long. *l.* nearly 1ft. long, over 2in. in breadth. Solomon Islands, 1880. SYN. *Thrixspermum Moorei.*

S. muriculatus (slightly muricate). *fl.* light yellow, in very short racemes, sweet-scented, about ½in. across; sepals and petals with two purple bars. *l.* 6in. to 9in. long, lorate, obliquely notched or two-lobed. Stem 6in. to 8in. long, stout, rooting below. Andaman Islands, 1881. SYN. *Thrixspermum muriculatum.*

S. muscosus (mossy). *fl.* yellow and purple, small, borne on a short, hairy scape. *l.* distichous, oblong. Stem dwarf. Andaman Islands, 1893.

S. purpureus (purple).* *fl.* pale rose-coloured; lip of a deeper rosy-crimson than the sepals and petals, hollowed out near the tip somewhat in the form of a slipper; spikes about 8in. long, many-flowered. *l.* distichous, oblong-linear, emarginate, 3in. to 4in. long. India. SYN. *Camarotis purpurea* (L. S. O. 19; P. M. B. vii. 25).

S. rubricentrum (red-spurred). *fl.* white, having a red centre, spotted with darker red, twelve to twenty in a raceme; lip banded with red across the front. *l.* oblong, about 5in. long. Australia, 1880.

S. Sillemianus (Sillem's). *fl.* milk-white, slightly tinted with pale yellow; lip striped with purple, the middle lobe yellow inside and marked with two purple spots outside; peduncle two-flowered. *l.* elongated, terete. Birma (?), 1882. Habit of *Vanda teres*, but not quite so robust. SYN. *Thrixspermum Sillemianum.*

S. unguiculatus (clawed). *fl.*, sepals and petals light straw-colour; lip clawed, three-lobed, the side lobes white, streaked crimson, the middle lobe rounded, fleshy, dotted crimson; raceme three- or four-flowered. Manilla, 1848. SYNS. *Phalænopsis fuqax*, *P. Ruckeriana* (of gardens), and *Thrixspermum unguiculatum.* (W. O. A. vi., t. 266.)

SARCOCOCCA. *S. pruniformis* is the correct name of *S. saligna*. *S. Hookeriana* is a variety of this species.

SARGENTIA ARICOCCA. A synonym of **Pseudophœnix Sargenti** (which *see*).

SAROTHAMNUS SCOPARIUS ANDREANUS. A synonym of **Cytisus Andreanus** (which *see*).

SARRACENIA. To the species and hybrids described on pp. 363-7, Vol. III., the following should be added:

S. atrosanguinea (dark red). The correct name of this is *S. purpurea.*

S. Claytoni (Clayton's).* Pitchers beautifully coloured vinous-purple at the summit, shading to crimson. 1890. A distinct form, of rigid growth.

S. decora (comely). A garden hybrid, probably between *S. psittacina* and *S. variolaris.* 1889.

Sarracenia—*continued.*

S. Mandaina (Manda's). A garden hybrid between *S. flava rubra* and *S. Drummondii.*

S. porphyroneura (purple-nerved). *l.* erect, with a large, circular lamina, which, as well as the upper portion of the pitcher itself, is traversed by purple veins. 1882.

S. Sanderæ (Mrs. Sander's). A garden hybrid between *S. Drummondii alba* and *S. Cookiana.*

S. Sanderiana (Sander's). A garden hybrid between *S. Drummondii rubra* and *S. Farnhami.* 1897.

S. vittata maculata (striped and spotted). A garden hybrid between *S. purpurea* and *S. chelsoni.* 1891.

S. Willisi (Willis's). A garden hybrid between *S. Courtii* and *S. melanorhoda.*

S. Wilsoniana (Wilson's). A distinct and pleasing hybrid between *S. flava* and *S. purpurea.*

S. Wrigleyana (Wrigley's). A garden hybrid between *S. psittacina* and *S. Drummondii.* (R. G. 1889, p. 495, f. 75.)

SATURNIA. *See* **Moths.**

SATYRIUM. To the species described on pp. 367-8, the following should be added:

S. aureum is a form of *S. coriifolium.*

S. carneum roseum (rosy). *fl.* rose-coloured, produced in a bold head. 1889.

S. ciliatum is a form of *S. nepalense.*

S. membranaceum (membranous).* *fl.* bright or pale carmine, nodding, 1in. broad; petals fringed, serrated beyond the middle; lip having a recurved, serrulate tip; spike dense, 3in. to 5in. long. May. *l.* two, 4in. to 6in. long, spreading, rounded-ovate. Stem 1ft. to 2ft. high, very stout. South Africa, 1889. A handsome species. (B. M. 7104.)

S. militare (military). A synonym of *S. sphærocarpum.*

S. sphærocarpum (spherical-fruited). *fl.* white, with red spots and lines, Orchis-like, 1in. long, about twenty on an erect scape about 1ft. high; lip galeate. *l.* ovate-oblong, erect, acute. South Africa, 1893. (B. M. 7295.) SYN. *S. militare.*

S. Wightianum (Wight's). A form of *S. nepalense*, with a short, dense spike and few broad radical leaves.

SAURAUJA. To the species described on p. 368, Vol. III., the following should be added:

S. lanceolata (lanceolate). *fl.* umbellate, on axillary peduncles. *l.* oblong-lanceolate, acuminate, very minutely serrulated, bright green, glabrous when old, reddish-scaly on the nerves when young. Java, 1882. A shrub of stout growth.

S. serapiquensis has also been introduced.

SAUROMATUM. *S. pedatum*, *S. punctatum*, and *S. venosum* are now regarded as synonymous with *S. guttatum*. *S. venosum* thrives under greenhouse treatment.

SAURURUS. *S. chinensis* is now regarded as distinct from *S. Loureiri.*

SAUSSUREA. *S. japonica* is the correct name of *S. pulchella*. *S. macrophylla* is synonymous with *S. alpina.*

SAXEGOTHEA. *S. gracilis* is a garden name for **Podocarpus nubigena** (which *see*).

SAXIFRAGA. To the species and varieties described on pp. 371-6, Vol. III., the following should be added:

S. afghanica (Afghan). A synonym of *S. Stracheyi alba.*

S. aizoides autumnale (autumnal). A reddish-brown variety well worth cultivating.

S. Aizoon. Of this species there are several varieties differing only slightly from the type, such as *carinthiaca*, *incrustata*, *Malyi*, *pygmæa*, *rosularis*, and *Sturmiana.*

S. A. pectinata (comb-like). *l.* densely rosetted, silvery-margined.

S. ajugifolia (Ajuga-leaved). *fl.* yellowish-white, rather small, one to three on long, axillary peduncles. May and June. *l.*, lower ones mostly or all entire; upper ones divided into three to five linear lobes. *h.* 1ft. Pyrenees.

S. androsacea (Androsace-like). *fl.* white, large; petals obovate, somewhat retuse, longer than the calyx. June and July. *l.* herbaceous, obovate-spathulate, entire or rarely three-toothed. Stems almost leafless, one- to four-flowered, pilose. *h.* 1ft. Alps, 1792.

S. apiculata (apiculate).* *fl.* lemon-yellow, numerous, corymbose, borne on short, leafy stalks. Spring. *l.* bright green, narrow-lanceolate, disposed in small rosettes. Pyrenees. Plant very dwarf. (G. C. 1894, xv., pp. 556-7, f. 68.) SYNS.

Saxifraga—*continued.*

S. aretioides micropetala, *S. Frederici-Augusti* (of gardens), *S. Lapeyrousei*, *S. luteo-purpurea* (of gardens).

S. aretioides. Two good varieties of this species are *alba* (white) and *primulina* (soft yellow).

S. a. micropetala (small-petaled). A synonym of *S. apiculata*.

S. aspera (rough). *fl.* yellowish-white, rather large, disposed in a very loose panicle. May and June. *l.* linear, bordered with long hairs. Stems rooting; abortive branches bud-like. *h.* 2in. Alps and Pyrenees.

S. a. bryoides (Brya-like). This differs from the type in having glabrous leaves. Pyrenees and Auvergne.

S. atlantica (Atlantic). *fl.* whitish, large, scented, somewhat capitate, very shortly pedicellate. *l.* rounded, bright green; cauline ones sessile or nearly so. Stem slender. Atlas Mountains, 1895. A compact, dwarf species.

S. autumnalis (autumnal), of Linnæus. A synonym of *S. aizoides*.

S. biflora (two-flowered).* *fl.* varying from pale to deep red, in groups of two to five. May. *l.* obovate, flat, not dotted, cruciately opposite, somewhat imbricated. *h.* 2in. Alps and Pyrenees, 1820. Habit lax.

S. b. Kochii (Koch's). *fl.* rosy, purple, in twos and fours. Alps.

S. biternata (twice-ternate). *fl.* white, large; petals many-nerved, spathulate, slightly emarginate, twice as long as the calyx. *l.* of the rosette long-petiolate, biternate, the lobes rounded and obtusely toothed; cauline ones three- to five-cleft; floral ones entire. Stems slightly branched, tufted. Mountains of Spain. Plant hispid.

S. Boydii (Boyd's). *fl.* yellow, large. A garden hybrid between *S. Burseriana* and *S. aretioides*, with the leaves and habit of the former. 1890. (Gn. 1890, xxxviii., p. 10.) There is a white form (*alba*).

S. bryoides (Brya-like). A form of *S. aspera*.

S. cæspitosa (tufted). Two distinct varieties of this well-known species are *hirta* and *platyphylla*.

S. cartilaginea (cartilaginous).* *fl.* white, pink, or purple, unspotted, somewhat corymbosely paniculate; calyx lobes ovate, equalling the campanulate tube; petals obovate, contiguous at base. June to August. *l.* of the rosette oblong or obovate-oblong, acute or acuminate, cartilaginous-serrated. Stems few-leaved. Caucasus.

S. cervicornis (stag's-horn). A synonym of *S. pedemontana*.

S. Clusii (Clusius'). *fl.* white, yellow, and red, loosely paniculate; peduncles long, divaricate. *l.* alternate, obovate-cuneiform, toothed, flaccid. Stems striated. Pyrenees, &c., 1832. Plant very viscous-pilose. *S. propaginea* is a white-flowered, seedling form of this species.

S. cochlearis is now regarded as a distinct species, and not as a variety of *S. lingulata*.

S. c. minor (lesser).* A small variety of the pure white type, forming silvery cushions and graceful flowers.

S. corbariensis (Corbara). This is merely a form of *S. geranioides*. 1899.

S. cordifolia purpurea (purple).* This is a beautiful variety, sometimes catalogued as a *Megasea*. There is also a fine garden variety, BRILLIANT.

S. coriophylla (Coris-leaved). A variety of *S. Rocheliana*.

S. crassifolia aureo-marginata (gold-margined). A variegated form.

S. c. media (medium). *fl.* bright rose-pink. *l.* shining green.

S. c. orbicularis (orbicular). *fl.* pink, very profuse, standing well above the broad leaves.

S. c. ovata (ovate). Somewhat similar to *S. orbicularis*, but with narrower leaves.

S. c. rubra (red). *fl.* red. Otherwise this form resembles *S. c. ovata*.

S. crustata (encrusted).* *fl.* two or three to a peduncle, disposed in a few-flowered, erect panicle. June and July. *l.* very narrow, ciliated at base. Otherwise like *S. longifolia* (of which it was formerly classed as a variety). Switzerland, 1800.

S. cuneifolia (cuneate-leaved). *fl.* white, with a yellow mark at the base of each petal; panicle narrow. May and June. *l.* obovate-cuneiform, very obtuse, shortly petiolate, serrate-toothed, dark green above, pale and reddish beneath. Stem 5in. to 6in. high. Root emitting runners. Alps, 1768. There are several varieties, of which *apennina* is the best.

S. dentata (toothed). A variety of *S umbrosa*.

S. diapensioides tombeanensis. *fl.* white, three or four to each of the blood-red stems. *l.* rosulate, erect, ovate-lanceolate or subulate. Tyrol, 1838.

S. Engleri (Engler's). *fl.* white, small. *l.* thick, deep green, gradually changing to golden-yellow in winter, with slight crustaceous margins. A hybrid between *S. Aizoon* and *S. cuneifolia*.

Saxifraga—*continued.*

S. exarata (furrowed). *fl.* white, four to six in a panicle; petals obovate, three-nerved. June and July. *l.* cuneiform, sessile, three-lobed; mid-lobe oblong, obtuse, the lateral ones undivided or bipartite. *h.* 6in. Alps, Pyrenees, &c., 1800. Plant polymorphous, tufted, glandular-viscid. SYN. *S. pulchella*. There is a variety in cultivation known as *nervosa*.

S. Forsteri (Forster's). A hybrid between *S. cæsia* and *S. mutata*.

S. Frederici-Augusti (Frederick Augustus'), of gardens. A synonym of *S. apiculata*. The true *S. Frederici-Augusti* is a rare and distinct plant, with a spicate inflorescence and purple flowers, and is not at present in cultivation in this country.

S. glauca (glaucous). A synonym of *S. diapensioides*.

S. globulifera (globe-bearing).* *fl.* white. *l.* nerved, spathulate, entire; upper ones palmately three- to five-cleft; those on the floriferous branches remote, linear. Stems bulbiferous. Atlas Mountains, 1895. This makes a turfy carpet of bright green leaves, and in the winter they turn purplish-red.

S. hibernica (Irish). A name applied to forms of *S. hypnoides* and *S. umbrosa*.

S. Huetiana (Huet's).* *fl.* bright yellow, small but very numerous, solitary, axillary, on long peduncles. May. *l.* alternate, petiolate, reniform, somewhat lobed, bright green. Branches numerous, slightly fleshy, forming a charming, round tuft. *h.* 4in. to 6in. Asia Minor. A capital annual for either borders or edgings.

S. Huguenini (Huguenin's).* *fl.* white, solitary, shortly stalked. *l.* imbricating, oblong, ciliate-toothed, ¼in. to ½in. long. *h.* 1in. to 2in. Eastern Swiss Alps, 1826. A neat little plant, of creeping, tufted habit. (R. G. 1230B.)

S. hypnoides. Of this well-known species there are two or three varieties that are well worth cultivating—*S. h. variegata*, *S. h. variegata compacta*, and *S. Whitlavii*.

S. japonica (Japanese). A garden name for a form of *S. sarmentosa*.

S. juniperina (Juniper-like). A synonym of *S. juniperifolia*.

S. Kolenatiana (Kolenat's). This species is closely allied to *S. cartilaginea* (of which it was formerly classed as a variety); it differs mainly in having the serratures of the leaves rather more acute than in that species. Asia Minor.

S. lantoscana (Lantosca).* A beautiful variety of *S. lingulata*, with gracefully arching panicles of white flowers. There is also a still more lovely form, *superba*.

S. Lapeyrousei (Lapeyrouse's). A synonym of *S. apiculata*.

S. latepetiolata (broadly-petiolate).* *fl.* white, ¼in. in diameter, crowded. *l.* borne on broad petioles, reniform, deeply three- to five-lobed, coarsely crenate, glandular-hairy; lower ones forming a dense rosette; upper ones attenuated. Stem 8in. to 12in. high, branched, robust. Spain, 1839. A remarkable, biennial species. (B. M. 7056.)

S. lingulata lantoscana (Lantosca).* *fl.* creamy-white; spike slightly drooping. *l.* crowded in the rosette. Otherwise resembling *S. Cotyledon pyramidalis*. A very fine variety. (G. C. 1881, xv., pp. 109, 540.)

S. longifolia-Cotyledon (hybrid). A garden hybrid between the species indicated in the name. 1887.

S. longifolia-marginata (hybrid). A garden hybrid between the species named.

S. luteo-purpurea (yellow and purple). A garden synonym of *S. apiculata*.

S. luteo-viridis (yellow and green). *fl.* green; inflorescence contracted, cymose-paniculate, six- to twelve-flowered. *l.*, lower cauline ones very short, obovate-spathulate, glabrous; middle ones spathulate-linear; rosette ones rounded or acute, spathulate-lingulate, glabrescent above, ciliated and violet-tinted beneath. Transylvania.

S. macropetala (large-petaled). *fl.* deep lilac, like those of *S. oppositifolia*; ovary having a ring-like disk round its base. *l.* crowded, roundish or cuneate, obtuse, ciliated, pitted. Tyrol, 1883. Allied to *S. oppositifolia*.

S. Malyi (Maly's). This is a form of *S. Aizoon*.

S. McNabiana (McNab's).* A garden hybrid between *S. Cotyledon* and *S. Hostii*. 1890.

S. Milesii is now classed as a species and not as a variety of *S. Stracheyi*.

S. montavoniensis. *fl.* white, with the stamens and calyx red. 1890. Probably a variety of *S. Cotyledon*. (R. G., t. 649.)

S. muscoides moschata is the correct name of *M. moschata*. There are several colour-forms of this, including *atropurpurea*, *compacta*, and *Rhei*.

S. oppositifolia compacta (compact).* A beautiful form, flowering freely in spring. The flowers are purple. A moist position is necessary. Sometimes this is accorded specific rank and classed as *S. Rudolphiana*.

S. o. grandiflora (large-flowered).* *fl.* rose, twice the size of the type.

Saxifraga—*continued.*

S. o. pallida (pale). A form with paler flowers than the type. 1888.

S. o. pyrenaica splendens (splendid).* A lovely rosy-crimson form.

S. o. Rudolphiana (Rudolph's). *fl.* pinkish-purple, solitary or twin. Habit spreading.

S. ovata (ovate). A form of *S. crassifolia.*

S. palmata (palmate). A form of *S. hypnoides.*

S. paniculata (paniculate). A synonym of *S. geranioides.*

S. pectinata (comb-like). A form of *S. Aizoon.*

S. pedatifida (pedately-cleft). *fl.*, peduncle and calyx pilose-glandular. May. *l.* five-lobed; lobes oblong-linear, entire, more or less acute, rarely gum-bearing; cauline ones two- or three-lobed. Otherwise like *S. geranioides* (of which it was formerly regarded as a variety). South of France.

S. pedemontana (Piedmont). *fl.* white, sub-corymbose; calyx segments linear; petals obovate-oblong, much longer than the calyx. July and August. *l.* of the rosette triangular-cuneiform, rather thick, three-lobed, strongly nerved; lobes obtusely toothed at apex. Stems almost naked, erect. Alps of Piedmont, 1824. Plant pilose-viscid. SYN. *S. cervicornis.*

S. planifolia (flat-leaved). *fl.* white; calyx lobes ovate, obtuse; petals obovate, slightly retuse, three-nerved. July and August. *l.*, lower ones oblong, obtuse, dense; cauline ones distant; all slenderly (about) three-nerved. Switzerland, Piedmont, and Pyrenees. Plant densely tufted, softly pilose.

S. propaginea (propagating). A form of *S. Clusii.*

S. pubescens (downy). *fl.* few on an almost naked stem. *l.* of the rosette clustered palmate; segments linear, viscid-pubescent. Pyrenees, &c.

S. pulchella (rather pretty). A synonym of *S. exarata.*

S. Rudolphiana (Rudolph's). A form of *S. oppositifolia.*

S. scardica (Scardi Mountains). *fl.* white, few in an erect corymb; calyx glandular; petals obovate, twice or thrice exceeding the calyx. June and July. *l.* rigid, glaucous, glabrous, lanceolate, acute, somewhat concave above, keeled beneath, scabrid-denticulate at base. Orient. Plant tufted.

S. Schmidtii is perhaps a form of *S. ligulata.*

S. sponhemica. *fl.* white, ½in. across; petals marked with three green nerves; panicle very many-flowered, 8in. to 12in. high. *l.* deeply lobed or cleft; segments acuminate-subulate. *h.* 4in. Europe. Plant emitting runners at base. Allied to *S. hypnoides.*

S. taygetea is now regarded as a distinct species, and not as a variety of *S. rotundifolia.*

S. tombeanensis. A form of *S. diapensioides.*

S. tricolor (three-coloured). A form of *S. sarmentosa.*

S. tyrolensis (Tyrol). A garden hybrid between *S. cæsia* and *S. squarrosa.*

S. umbrosa dentata (toothed). *fl.* dotted with pink, in narrow panicles; peduncles 8in. high. *l.* orbicular, deeply toothed, very pale beneath. Pyrenees.

S. u. Ogilvicana (Ogilvie's).* *fl.* pinkish; panicles dense, about 6in. high. A fine variety.

S. Vandellii (Vandell's). *fl.* white; corymbose, pedunculate; calyx lobes ovate; petals obovate-cuneate, much longer than the calyx. June to August. *l.* firm, ciliated; radical ones densely clustered. Tyrol, &c. Plant pilose-glandular.

S. Wulfeniana (Wulfen's). This is identical with, or a form of, *S. retusa.*

S. Zimmeteri (hybrid). A hybrid between *S. Aizoon* and *S. cuneifolia.*

Hybrids. Besides the hybrids, &c., already named, the following are worthy of mention: Distinction, Hybrida Nana, La Gave Dauphine, Portæ, and Progress.

SCABIOSA. Star Head. To the species, &c., described on pp. 376-7, Vol. III., the following should be added:

S. alpina (alpine). A synonym of *Cephalaria alpina.*

S. caucasica alba (white). A variety with white flower-heads. 1895.

S. Correvoniana (Correvon's).* *fl.-heads* pale yellow, large, with a large involucre. May to August. Stems erect, 7in. to 9in. high. Abchasia, 1892. A handsome, bushy plant.

S. Metaxasii (Metaxas'). A synonym of *S. palæstina.*

S. ochroleuca Webbiana (yellowish-white, Webb's). The correct name of *S. Webbiana.*

S. palæstina (Palestine). *fl.-heads* very variable in colour, form, and size; corollas more or less radiate, the segments three- to six-cleft. Summer. *l.* variable; lower ones toothed or lyrate, rarely pinnatipartite; upper ones lyrate or pinnatipartite. Stem erect, variable in height. Orient. A more or less pubescent annual. SYN. *S. Metaxasii.*

Scabiosa—*continued.*

S. parnassi (Parnassus). A synonym of *S. Pterocephala.*

S. stellata (star-like). *fl.-heads* pink or bluish-white, long-pedunculate; corollas radiant. July. *l.* incised or almost lyrate; terminal lobe the largest, obovate, toothed. Stems branched. *h.* 1½ft. Mediterranean region, 1823. Annual.

S. Victoriæ (Victoria's). A garden hybrid. 1888.

SCÆVOLA. To the species described on pp. 377-8, Vol. III., the following should be added:

S. cuneiformis (wedge-shaped). *fl.* blue, sessile, in a long, interrupted spike; corolla ⅜in. long. *l.* petiolate; lower ones obovate, often 2in. long; upper ones oblong-cuneate, passing into sessile bracts, which are mostly under ½in. long and quite entire. Stems erect or ascending, herbaceous. 1824.

S. Taccada (Taccada). A synonym of *S. Kœnigii.*

SCALE INSECTS (*Coccidæ*). These, together with their near allies the Mealy Bugs, &c., are very inimical to plant-life, and with one or two notable exceptions offer no compensating advantages. Such exceptions are to be found in the case of the Cochineal Insect (*Coccus Cacti*) and the lesser known Lac Insect (*Tachardia lacca*), each of which yields an article of commerce of economic utility. Against these two must be set a very large number of most objectionable pests alike to outdoor flowers, fruit (both outside and under glass), and greenhouse and stove plants. In this country alone the list of indigenous species is a formidable one, but small in comparison with those found in some other countries, with which the writings of Douglas, Cockerell, Comstock, and others have familiarised us.

The most injurious species that of recent years has been recorded in any country is the San Jose Scale (*Aspidiotus perniciosus*), so destructive to nearly every kind of fruit in California and elsewhere. So far, however, it has not yet made its appearance here, though with the facilities now existing for an interchange of commerce its advent may not be long delayed. Already a near relative in the Japanese Cherry Scale (*Diaspis amygdali*) has found its way here upon imported species of the genus *Prunus*; but thanks to the note of warning sounded by Mr. R. Newstead, of Chester, it was promptly stamped out. Unfortunately another species has found a lodgment here, and it looks as if it has come to stay. We refer to *Orthezia insignis.*

Worthy of note in connection with Coccids generally is the omnivorous nature of the majority, and in none is this characteristic exemplified better than in the *Orthezia* just noted, and in the Common Mealy Bug of our plant-houses (*Dactylopius destructor*). Fruit trees harbour several species, the most destructive being the Oyster Shell Bark Louse (*Aspidiotus ostreæformis*), the Mussel Scale (*Mytilaspis pomorum*), Peach Scale (*Lecanium persicæ*), Brown Currant Scale (*Lecanium coryli*), and the Cottony Cushion Scale (*Pulvinaria ribesiæ*). Palms are also considerably preyed upon, the species varying from the curious black, thread-like *Ischnaspis filiformis* to the Oleander Scale (*Aspidiotus Nerii*). Orchids and Camellias suffer not a little from the attention of Coccids; while Roses are infested by *Diaspis rosæ* and *Lecanium rosæ.* *Aspidiotus britannicus*, recorded from Kew as having been found upon Hollies, is new to this country; while that establishment has also the credit for enriching Science with a new species, *Fiorinia kewensis*, discovered by Mr. Newstead.

Of the newly-recorded species most interest centres around *Orthezia insignis*, a beautiful but very destructive and omnivorous species. Six years ago it formed the subject of a report issued by the Massachusetts Agricultural College, and prepared by Mr. C. H. Fernald. It was then described as "A New Greenhouse Pest." Since that time it has been found in many greenhouses in this country, and it behoves every gardener to be aware of the pest. In America the insect goes by the name of the Black-Tailed Mealy Bug, the White-Tailed Mealy Bug, Lantane Bug, and White Fly, the last being a singularly absurd name. Twice we have met with it on Lantanas, and in each case the gardener was powerless to do anything to get rid of the pest. Only the females were, however, observed, though a very careful watch was kept for the males. To judge by the list of food-plants it has most accommodating tastes, and on that account alone would be a most undesirable visitor in any greenhouse. In America the chief food-plants are given as Lantanas, Ageratums, Libonias, Verbenas, Fuchsias, Coleus, Pelargoniums,

Scale Insects—*continued.*

Cinerarias, Petunias, and Celosias. Here the writer has seen them upon Lantanas only.

Mr. Fernald thus describes the adult female (see Fig. 662, A): Body is broadly oval, and from 1·2mm. wide by 1·5mm. in length, and varies in colour from ochreous mottled with very dark, dull green between the segments to an almost uniform dark, dull green. The surface of the body is partially concealed by plates (lamellæ) of a wax-like substance. The first of these plates is somewhat triangular in outline, and projects slightly forward; the second and the third are shorter and broader than the first, and project outwardly; while those from the fourth on are narrower and longer, and are curved downwards and backwards over the marsupium. There is also a series of plates on the ventral surface. Those behind the last legs are quite large, and are situate somewhat between the coxæ, and project over the

FIG. 662. ORTHEZIA INSIGNIS (after Fernald), showing (A) Adult Female, dorsal view; (B) Nymph, after Second Moult; (C) Adult Male, dorsal view. All much enlarged.

marsupium. This latter varies from 3mm. to 5mm. in length; it is generally nearly straight, but often much curved upwards, with the sides slightly convergent and the end truncate. These plates, which vary with the individuals, consist of striated compact masses of a brittle, snowy-white substance (whence the name of White-tailed Mealy Bug). The substance is secreted by numerous fine papillæ. These, however, are not observable until the plates have been removed or rendered translucent with potash or soda. They are extremely fragile, but are quickly replaced. The eggs are laid and the young hatched in the space between the plates. Mr. Fernald estimates the number of eggs laid varies from 125 to 175, and that they hatch out in about two months. The young Scales are naked when first hatched, but are gradually coated with the secretion already noticed. There are probably three broods a year in this country.

The most effective preparation against this Coccid appears to be Paraffin Emulsion. This can now be obtained in many quarters. Fir-Tree Oil is also beneficial, but must be very carefully employed, otherwise the foliage of delicate plants is likely to be affected. The directions of the makers should be strictly followed. There is one thing that hardy-plant lovers have to be thankful for, and it is that there is no chance of an infestation, as the insects are quite unable to withstand cold or frost.

In dealing with Coccids generally, the best results have been obtained by the use of Kerosene Emulsion (*see* **Insecticides**). This or any other insecticide must be used

Scale Insects—*continued.*

in combination with common sense. The nature of the plant, or even of its parts, must be carefully considered, the condition of the weather at the time of the application of the insecticide, and even the accepted quantities in solution may have to be modified to meet this or that condition of plant-life. For instance, the treatment that could be meted out to a trunk of an Apple- or a Pear-tree, could not be employed on the somewhat delicate leaf of a Palm or other greenhouse or stove occupant; and so it is with all. Tree-trunks, branches of fruit and other trees against walls are all best treated in winter when they are at rest, using a stiff (painter's) brush, and well working the insecticide into all likely crevices. Plants under glass are safest treated in the evenings of bright days, never during bright sunlight. Then, again, even the stages of certain of the insects must be taken into consideration if good results are to be obtained. Take for instance the case of the Coccids that elaborate a Scale. To spray these when the scale-like covering has been provided is useless; for though it would of course be an easy matter to employ an insecticide to destroy the "Scales," yet there would be the danger also of destroying the trees themselves. The best period for waging war against these species is when the larvæ are in the active stage. Then they are vulnerable and readily destroyed. Besides Kerosene Emulsion, referred to in Vol. III., and the several other insecticides named, Gishurst Compound and Fir-Tree Oil may be mentioned as being very effective though not suited to large areas of trees and plants under cultivation, being far too expensive. For greenhouse and stove subjects they are, however, available, and when used with care and according to the directions supplied, may be relied upon to do their work. We have not described in detail the various Coccids mentioned, for the simple reason that in the majority of cases the distinguishing characteristics are not seen by the unaided eye. The more important, however, have been enumerated under their respective headings. *See also* **Scale Insects,** Vol. III.

SCAPHOSEPALUM (from *skaphe,* a boat, and *sepalum,* a sepal; in allusion to the form of the sepals). ORD. *Orchideæ.* A small genus of Orchids, natives of tropical America, formerly included under **Masdevallia** (which *see* for culture), but differing in having the dorsal sepal free, the lateral ones forming a boat shape under the lip, which is strongly recurved and curled up. *S. anchoriferum, S. breve, S. gibberosum, S. pulvinare,* and *S. swertiæfolium* will be found described under *Masdevallia,* in Vol. II.

S. antenniferum (antennæ-bearing). *fl.* greenish-yellow, lined with brown; scape 1½ft. long. *l.* elliptic, 3in. to 8in. long. 1890. Allied to *S. pulvinare.*

S. microdactylum (small-fingered). *fl.* greenish-yellow and brown, small; scape 5in. long. *l.* 2in. long, oblong, fleshy, with three apical teeth. 1893. Allied to *S. ochthodes.*

S. ochthodes (rugged). *fl.* yellow, fleshy; lateral sepals rectangular, erect, tumid; petals ligulate, acute; lateral lobes of lip semi-ovate, entire, the mid-lobe oblong, serrulated; keels two; raceme elongated, many-flowered; peduncle nearly 1ft. long, very slender, densely verrucose. Colombia.

S. punctatum (dotted). *fl.* pale greenish, small, spotted with dark purplish-brown; lateral sepals more ochreous, their tails ¼in. long; scape descending, bearing a succession of flowers. *l.* 3in. to 4in. long, ¼in. to ⅜in. broad. 1883. Allied to *S. swertiæfolium.* (B. M. 7165.)

SCAPHYGLOTTIS. *S. Kienastii* is the correct name of *Ponera Kienastii.*

SCARES. Many devices to scare birds from fruit trees, seeds, ripe Corn, &c., are adopted, but few, if any, are really effectual, as the birds soon become accustomed to them, and carry on their depredations. Seed-beds and low-growing crops are protected by threads of black cotton run over in and about them. This is almost invisible, and the birds flying about get their wings entangled therein, and carefully avoid that place in the future.

SCARLET TIGER MOTH. *See* **Tiger Moths.**

SCELOCHILUS. To the species described on p. 380, Vol. III., the following should be added:

S. carinatus (keeled). *fl.* about seven in a short, pendulous raceme; sepals bright yellow, ⅜in. long; petals purple and

Scelochilus—*continued.*

white, ½in. long; lip white, ¼in. long, with a purple blotch. *l.* lanceolate, 4in. long. 1895.

S. variegatus (variegated). *fl.* whitish, lined with purple. *l.* erect or spreading, narrow-lanceolate, 4in. to 5in. long. Pseudo-bulbs flat, very thin. Colombia, 1895.

SCEURA. A synonym of **Avicennia** (which *see*).

SCHAUERIA. A synonym of **Hyptis** (which *see*).

SCHEELEA. To the species described on p. 380, Vol. III., the following should be added:

S. kewensis (Kew). *fl.* bright purple, small, crowded; male and female spadices short and stout; spathes stout, boat-shaped, 2½ft. long. *l.* pinnate, about 25ft. in length. Tropical America, before 1897. (B. M. 7552-3.)

S. amylacea is included in the Kew Collection.

SCHINUS. *S. dependens* is the correct name of *Duvaua dependens.* (B. M. 7406.)

SCHISMATOGLOTTIS. *S. variegata* (of gardens) is synonymous with *S. neoguineensis.*

SCHIZÆA. Comb or Rush Ferns. On account of the difficulties with which their culture is beset, Schizæas are seldom met with in general collections; yet some of the species are well worth a little extra attention. It may be useful to note that where they are found to thrive under cultivation they are invariably grown in a compost of roughly-broken peat and loam, in about equal parts, with ample drainage; for, although growing naturally in swampy places, under culture they greatly dislike stagnant water. Frequent and copious waterings at the roots are, however, necessary, as is a well-ventilated position. We have never heard of Schizæas being raised from spores, although these have frequently been received in this country from Australia and elsewhere.

SCHIZANDRA. To the species described on p. 383, Vol. III., the following should be added:

S. Hanceana (Hance's). *fl.* scarlet, green at base, rather large. *l.* oblong-lanceolate; petioles robust. South China. A much-branched, highly glabrous, twining, greenhouse shrub. SYNS. *Cosbæa coccinea, Kadsura chinensis.*

SCHIZANTHUS. To the species described on p. 384, Vol. III., the following should be added:

S. Grahami lilacinus (lilac). A fine variety, having lilac-coloured flowers, with a dark golden-yellow, brown-veined upper lip, and lilac tips. (R. G. 1887, p. 665, f. 169.)

S. incanus (woolly). A synonym of *S. retusus.*

S. papilionaceus (butterfly-like). A purple-spotted form of *S. pinnatus.* TOM THUMB is a dwarf, compact form of that species.

S. retusus is now classed as a distinct species, and not as a variety of *S. Grahami.* SYN. *S. incanus* (B. H. 1852, t. 6, f. 2).

S. violaceus (violet). A form of *S. pinnatus.*

S. wisetonensis (Wiseton).* *fl.* varying in colour from white through blush and pink to crimson-brown, some with a yellowish suffusion, freely produced. 1900. A useful and attractive garden variety.

SCHIZOCASIA (from *schizo*, to cut or split, and *casia*; in allusion to its divided leaves and its relationship to *Colocasia*). ORD. *Aroideæ.* A small genus (three or four species) of stove herbs, with a thick caudex, natives of New Guinea, Siam, and the Philippine Islands. Flowers monœcious, on an appendiculate spadix, the males and females remote. Leaves ovate-cordate, pinnatipartite; petioles elongated, terete. According to Mr. N. E. Brown, there are no real characters to separate *Schizocasia* from **Alocasia** (which *see* for culture).

S. Portei (Porte's). *l.* oblong-triangular, sagittate, pinnatipartite; lateral divisions semi-ovate or oblong, obtuse, with a deep sinus; stalks half as long again as the leaves. Caudex thick. New Guinea, 1862.

S. Regnieri (Regnier's). *fl.* unknown. *l.* large, pinnatifid, 10in. to 12in. long, peltate, repand, dark green above, the midrib and principal nerves much paler, glaucescent beneath, the margins undulated; pinnæ costate, mucronate at apex, cordate-lanceolate; petioles 1½ft. long, sheathing at base, terete, yellow, with reddish, hieroglyphic markings. Siam, 1887. (I. H. ser. v. 6.)

SCHIZOCODON (from *schizo*, to cut, and *kodon*, a bell; in allusion to the fringed corolla). ORD. *Diapensiaceæ.* A small genus (three species) of hardy, perennial herbs, very closely allied to *Shortia*, but having racemose flowers, fringed corolla lobes and filaments varying in length; they are found on the

Schizocodon—*continued.*

mountains of Japan. Only one species has been introduced; it is found growing in stony places. For culture, *see* **Perennials.**

S. soldanelloides (Soldanella-like). *fl.* deep rose in the centre, shading to blush-white or white, fringed like those of *Soldanella*, 1in. across; scape four- to six-flowered. March. *l.* small, evergreen, ovate or orbicular, cuneate or subcordate at base, deeply-toothed. *h.* 2in. to 4in. 1892. (B. M. 7316; G. C. 1893, i., p. 415, f. 59; J. H. ser. iii., xxvi., p. 23, f. 55.)

SCHIZOMYCETES. *See* **Pear—Fungi.**

SCHLUMBERGERIA. J. G. Baker includes this genus under **Caraguata** (which *see*).

SCHŒFFIA. A corruption of **Schœpffia** (which *see*).

SCHŒNLANDIA GABONENSIS. ORD. *Pontederiaceæ.* This name has been given to a stemless, terrestrial, stove plant, allied to *Monochoria*, introduced from Western tropical America in 1896. The solitary flowers (which, as well as the branches and bracts, are violet) spring from short branches in the axils of the bracts, and the leaves are cordate and acute. It is said to be of easy culture, and to have a prolonged flowering period.

SCHŒNOCAULON (from *Schoinos*, a Rush, and *kaulos*, a stem; in allusion to the Rush-like scape). SYNS. *Asagræa, Sabadilla.* ORD. *Liliaceæ.* A small genus (five species have been enumerated) of half-hardy, bulbous plants, natives of the Mexico-Texan region. Flowers rather small, in long, dense, terminal, sub-sessile spikes; perianth persistent, the segments distinct, subequal, narrow-lanceolate or linear, erecto-patent; stamens six, hypogynous, longer than the segments; bracts small; scape simple, tall, leafless. Leaves radical, long-linear. The culture of *S. officinale*, the only species introduced, is not yet understood; the plant is, however, only of botanical interest.

FIG. 663. SCHOMBURGKIA TIBICINIS.

SCHOMBURGKIA. To the species described on p. 386, Vol. III., the following should be added:

S. carinata (keeled). A synonym of *S. Lyonsii.*

S. chionodora (snow-gift). *fl.* white, with a purple spot on the lip, numerous; sepals ligulate, acute; petals spathulate, blunt; lip large, four-lobed, toothleted and wavy, with five entire keels on the disk. *l.* cuneate-oblong, obtuse, 4in. to 5in. broad. Pseudo-bulbs many-angled, 1ft. long or more, having but a single, central cavity. Central America, 1836.

S. c. Kimballiana (W. S. Kimball's).* *fl.* light purple; inflorescence with numerous branches. 1888.

Schomburgkia—*continued.*

S. Humboldtii (Humboldt's).* *fl.* resembling those of a Lælia; sepals and petals wavy, pale lilac, the petals tinted purple towards the apex; lip with triangular, amethyst-purple side lobes, and a bilobed, fringed and crisped front lobe, of a bright purple, with paler streaks, the disk yellow, with five to seven keels, purple towards their base. Venezuela. A handsome species. (R. X. O., t. 53.)

S. lepidissima (very pleasant). *fl.* closely resembling those of *Lælio̱psis domingensis*, borne on a branched stem 3½ft. long. Pseudo-bulbs very strong, about 16in. long and 6in. in circumference, with two broad green leaves at the apex. Habitat not recorded, 1889.

S. marginata immarginata (not margined). This is chiefly dependent for its character on the absence of yellow margins on the sepals and petals. 1887.

S. rhionodora. A misprint for *S. chionodora.*

S. rosea (rosy). *fl.* smaller than in *S. undulata* (to which this species is allied); sepals and petals reddish-purple, with wavy margins; lip rosy-purple, with three white keels; column white, spotted with purple; spike rather short for the genus. Winter and spring. Colombia. (L. x., t. 475.)

Schomburgkia—*continued.*

S. Sanderiana (Sander's).* *fl.* rosy-purple, about 3in. across; petals broader than the sepals; lip three-lobed, the mid-lobe 1¼in. long, wavy-margined, veined with deep rosy-purple in the centre; scape over 2ft. long, many-flowered. *l.* two, thick, rigid, obtuse, 5in. long. Pseudo-bulbs conico-cylindrical, about 9in. high. Habitat not recorded, 1886. A beautiful species, allied to *S. Humboldtii.* (J. H. 1891, xxii., p. 163, f. 30, xxiii., p. 503, f. 92; R. ser. ii., t. 59.)

S. Thomsoniana (Thomson's). *fl.* light yellow and sulphur, with purple markings; sepals and petals ligulate, acute, undulated; lip trifid, the lateral segments triangular, extrorse, obtuse, the middle one ligulate, emarginate, much crisped. Honduras, 1887. Allied to *S. tibicinis.* SYN. *Bletia Thomsoniana.*

S. tibicinis. Fig. 663 illustrates the fairly well-known and beautiful Cow-horn Orchid, described in Vol. III.

FIG. 664. SCIADOPITYS VERTICILLATA.

SCHOTIA. *S. tamarindifolia* is a form of *S. speciosa.*

SCHRANKIA. According to the Kew authorities, this is the correct spelling of *Schranckia.*

SCHUBERTIA (of Blume). A synonym of **Horsfieldia** (which *see*).

SCHUBERTIA (of Martius). A synonym of **Araujia** (which *see*).

SCHWÆGRICHENIA. A synonym of **Anigozanthos** (which *see*).

SCHWEIGGERIA. *S. fruticosa* (Tongue Violet) is the correct name of the plant described on p. 387, Vol. III., as *S. pauciflora.*

SCIADOPHYLLUM. *S. leptophyllum* is a synonym of *Dizygotheca leptophylla.*

SCIADOPITYS VERTICILLATA. This is one of the handsomest and most distinct of Japanese Conifers (Fig. 664, for which we are indebted to Messrs. Veitch and Sons). It is thoroughly hardy, but dislikes cold winds, especially when growth is tender. This species is somewhat slow in growth, and delights in peaty soil with which is incorporated a quantity of leaf-mould. An eastern exposure should be avoided, but the greatest drawback to its successful culture is a cold, wet, badly-drained soil, as anything like stagnation at the roots is fatal to it. As it does not transplant well, great care should be taken in the preparation. A good ball of earth should be attached to the roots, and the latter protected from drying winds by placing mats or similar material round the ball. After planting is completed, water should be given to settle the soil about the roots, and an occasional damping overhead will induce healthy growth. A yearly top-dressing of leaf-mould will increase the vigour of the plants. *S. verticillata* is well adapted for planting as single specimens on the lawn, and is serviceable for all kinds of decorative work. It forms a bold, symmetrical specimen, with horizontal, spreading branches, and long, narrow, leathery leaves of the deepest green, produced in whorls of from thirty to forty at the tips of the growths, and bearing some resemblance to an open umbrella.

SCILLA. Many of the Scillas will thrive under the shade of trees where little else will grow. To the species described on pp. 388-91, Vol. III., the following should be added:

S. Adlami (Adlam's). *fl.*, perianth mauve-purple, ¼in. long; pedicels ¼in. to ½in. long; raceme short; peduncle slender, 3in. to 4in. long. April. *l.* single, linear, rather fleshy, 8in. to 9in. long, ½in. broad. Eastern Natal, 1891. Greenhouse.

S. anti-taurica (Anti-Taurus). A form of *S. sibirica.*

S. Bellii (Bell's). *fl.*, perianth brownish-blue, campanulate, ¼in. long, the segments oblong-spathulate; bracts white; raceme short, ten- to twelve-flowered; scape slender, terete, 3in. to 4in. long. Spring. *l.*, produced ones two or three, oblong-lanceolate, 3in. to 4in. long, acute, erect, fleshy. Laristan, Central Persia, 1884. Hardy.

S. bifolia. A curious hybrid was raised in 1891 between this species and *Chionodoxa Luciliæ*, but it is of no horticultural value.

S. b. alba (white).* A charming variety, with ivory-white flowers.

S. b. rosea (rose). A pretty rose-coloured variety.

S. b. Whittalli (Whittall's).* *fl.* bright blue, borne in a close raceme. 1891.

S. bipartita (bipartite). *fl.*, perianth porcelain-blue. Marocco, 1835. A dwarf, hardy, winter-flowering plant, regarded by the Kew authorities as a form of *S. lingulata.*

S. Buchanani (Buchanan's). *fl.*, perianth green, ¼in. long, with purple filaments; raceme dense, oblong, 2in. long; peduncle flexuous, 6in. to 8in. long. May. *l.* three, lanceolate. Mozambique District, 1893. Greenhouse.

S. festalis (festal). The correct name of *S. nutans.*

S. f. cernua (drooping). *fl.* of a very clear blue, in a conical spike 4in. long. Central Europe. A form of *S. festalis.* Hardy.

S. Galpini (Galpin's). *fl.*, perianth bright mauve-purple, ¼in. long; filaments bright purple; raceme dense, sub-globose, ¾in. in diameter. *l.* three or four, oblong-spathulate, sessile, 2in. to 3in. long. Bulb 1in. in diameter. Transvaal. Greenhouse.

S. hispanica. *alba* and *rosea* are white- and pink-flowered forms respectively. Those issued under these names by Messrs. Krelage, of Haarlem, are especially distinct, and advances upon those ordinarily grown as such. There is also a form *major*, which is larger than the type, as well as the garden form EMPRESS.

Scilla—*continued.*

S. hyacinthoides stricta (erect). In this form the flowers are borne on erect pedicels and the bulbs are solitary. 1890.

S. Kraussii (Krauss's). *fl.*, perianth bright blue, campanulate, ⅛in. long; pedicels erecto-patent, ¼in. to ½in. long; raceme moderately dense, 3in. to 4in. long; peduncle slender, 6in. to 9in. long. *l.* about four, spreading, lanceolate, strongly ribbed, densely pubescent, 2in. to 3in. long. Bulb 1½in. to 2in. in diameter. South Africa. Greenhouse.

S. laxiflora (lax-flowered). *fl.*, perianth green, ⅛in. long, central pedicels pale mauve, erect, ½in. to ¾in. long; raceme very lax, oblong, 3in. long; peduncle slender, 3in. long. *l.* three or four, oblong-lanceolate, mottled, the largest 3in. long. South Africa, 1891. Greenhouse.

S. Ledieni (Ledien's). *fl.*, perianth greenish, campanulate, ¼in. long; pedicels very short; raceme moderately dense, 3in. long; peduncle 6in. long. *l.* five or six, lanceolate, glaucous, 6in. to 12in. long, rooting at the tip, spotted. Bulb 1in. in diameter. Lower Guinea, 1889. Greenhouse. (R. G., t. 1294.)

S. leucophylla (white-leaved). *fl.*, perianth bright purple, tipped with green. Persia, 1893. This resembles some of the Hyacinths of the sub-genus *Bellevalia*, but the perianth segments are free to the base. Hardy.

S. lingulata (tongue-shaped). *fl.*, perianth blue, campanulate, star-like, about ¼in. long; raceme oblong, rather dense, six- to fifteen-flowered; scape 2in. to 4in. long. Spring. *l.* six to eight, fleshy-herbaceous, glabrous, ascending, lingulate-lorate, embracing the scape at base, 2in. to 3in. long, four to six lines broad. Bulb six to eight lines thick. Algeria, Marocco, 1887. (R. G., t. 1261, f. 2.) Hardy. The variety *alba* (R. G., t. 1261, f. 4) has white, and *lilacina* (R. G., t. 1261, f. 3) lilac, flowers.

S. nutans. The correct name, according to the "Index Kewensis," is *S. festalis.* Other forms are *bracteata* (long-bracted) and *cærulea* (blue).

S. pallidiflora. The correct name is *S. rigidifolia.*

S. patula (somewhat spreading). *fl.* resembling those of *S. festalis*, but rather larger, scentless; scape erect. *l.* four or five, lanceolate. Bulb ovoid. Europe. There are three varieties—*alba* (white), *major* (larger), and *rosea* (pink).

S. paucifolia (few-leaved). The correct name of *S. pauciflora.*

S. peruviana elegans (elegant). A red-flowered form.

S. polyantha (many-flowered). *fl.*, perianth green outside, dull purple within, ⅛in. long; pedicels ¼in. long; raceme dense, oblong, 4in. to 5in. long; peduncle 6in. to 9in. long, purple-spotted. *l.* four, lorate-oblong, sub-erect, 1ft. to 1¼ft. long, with darker blotches (purple at base). Bulb 1¼in. to 2in. in diameter. South Africa, 1878. Greenhouse.

S. præcox (early). A form of *S. bifolia.*

S. rigidifolia (rigid-leaved). The correct name of *S. pallidiflora.*

S. serotina (late). A synonym of *Dipcadi serotina.*

S. sibirica anti-taurica (Anti-Taurus). An early, robust, many-flowered, garden variety. 1890.

S. s. multiflora (many-flowered). A very floriferous form, having longer flower-spikes than in the type. 1895. (Gn. 1895, xlviii., p. 162, t. 1029.)

S. s. vera alba (true white). *fl.* pure white, large. 1893. A useful, dwarf variety.

S. sub-secunda (almost secund). *fl.*, perianth green, brownish outside towards the base, ⅛in. long; filaments bright purple; raceme dense, sub-secund, 6in. long; peduncle drooping, nearly 1ft. long. June. *l.* six to eight, lanceolate, 6in. to 12in. long, 1in. to 1½in. broad, tinged with purple at back and blotched a little towards the base. South Africa, 1881. Greenhouse.

S. Ughii. *See* **S. peruviana Hughii.**

SCINDAPSUS. *S. argyræa* is synonymous with *S. pictus* (Silver Vine). *S. pertusus* (R. H. 1883, p. 561, f. 111) is not a *Scindapsus*, but *Monstera deliciosa.* *S. anomalus* (R. H. 1884, p. 536, f. 114) has the young leaves entire and the older ones divided (SYN. *Marcgravia paradoxa*, of gardens).

SCIRPUS. To the species described on pp. 391-2, Vol. III., the following should be added:

S. maritimus (maritime). Sea Scirpus. *fl.*, spikelets of a rich brown, about ⅛in. long, sometimes two or three but oftener eight to ten in a cluster. Summer. *l.* long, flat, pointed, often far exceeding the stems. Stems sharply triangular, 2ft. to 5ft. high. British coasts. There is a variegated-leaved form that is well worth growing.

SCLEROCARPUS (from *skleros*, hard, and *karpos*, fruit; in allusion to the hardened enclosing bracts). ORD. *Compositæ.* A genus embracing about eleven species of greenhouse or half-hardy, perennial herbs, closely related to *Gymnolomia*, natives of tropical America, Africa, and Asia. Flower-heads yellow, rather small. Leaves usually alternate. Only one species calls for mention. For culture, *see* **Annuals.**

Sclerocarpus—*continued.*

S. uniserialis (in one series). *fl.-heads* orange-yellow, slightly scented, solitary on long peduncles. July to October. *l.* large, ovate, acute, irregularly toothed, crenulate. Stems much-branched. *h.* 3ft. to 4½ft. Texas. Half-hardy annual. SYNS. *Gymnolomia uniserialis* (of gardens), *Gymnopsis uniserialis.*

SCLEROTINIA DOUGLASII. *See* **Douglas Fir Blight.**

SCLEROTINIA FUCKELIANA. *See* **Velvety Mould.**

SCLEROTINIA PÆONIÆ. *See* under **Pæonia,** in present Volume.

SCLERRODERIS RIBESIA. *See* **Gooseberry Fungi.**

SCOLIOPUS (from *scolios*, tortuous, and *pous*, a foot; probably in allusion to the tortuous rhizome). ORD. *Liliaceæ.* A small genus (two species) of hardy or nearly hardy, rhizomatous, North American perennials, closely allied to *Medeola.* Perianth deciduous; segments distinct, the three outer ones broadly lanceolate, spreading, the three inner ones linear, erect. Leaves two at the tip of the stem, sessile or shortly petiolate. The only species introduced will probably thrive under the treatment recommended for **Trillium.**

S. Bigelovii (Bigelow's). *fl.* solitary on radical peduncles; perianth seven to nine lines long, the inner segments purple, the outer ones green, striated with purple. February. *l.* radical, ovate-elliptic to narrowly-oblanceolate, 4in. to 15in. long, spotted, sessile or narrowed at base. California. (G. C. 1894, i., p. 267, f. 23.)

FIG. 665. FROND OF SCOLOPENDRIUM VULGARE CRISTATUM.

SCOLOPENDRIUM. Scolopendriums are adapted for either the stove, the greenhouse, or the hardy Fernery. The best-known and most extensively cultivated is undoubtedly the common Hartstongue, *S. vulgare*, of which there are a large number of beautiful or merely curious forms found in gardens. They thrive best in a compost of a light, sandy nature, made up of two parts leaf-mould or peat, one part loam, and one part silver-sand, and are particularly useful for growing by the edge of water or in shady places, where it is often difficult to cultivate other plants with success.

With the exception of the varieties of *S. vulgare*, which are usually and with greater certainty increased by the division of their crowns (and a few by means of the bulbils produced on their fronds), the propagation of Scolopendriums is effected by spores, which are abundantly produced and germinate freely.

To the species and varieties described on pp. 393-4, Vol. III., the following should be added:

S. brasiliense (Brazilian). *sti.* short, hairy. *fronds* 6in. to 12in. long, 1in. to 1½in. broad, almost entire, tapering to both ends, coriaceous; veins intercrossing one another about two-thirds of the distance from the midrib to the edge. *sori* confined to the free veins. Brazil, 1836. Stove. SYN. *Antigramme brasiliense.*

S. officinale (officinal). A synonym of *S. vulgare.*

S. sibiricum (Siberian). *sti.* 2in. to 3in. long, naked, dark brown below. *fronds* dimorphous; barren ones 1in. long, barely ¼in. broad, ovate, acute; fertile ones 6in. long, ¼in. broad, prolonged and rooting at apex as in *S. rhizophyllum*, but narrowed at base. *sori* linear or oblong. Siberia, Japan, &c. This hardy species should be grown in a vertical position amongst stones, in a shady spot. SYN. *Camptosorus sibiricus.*

Scolopendrium—*continued.*

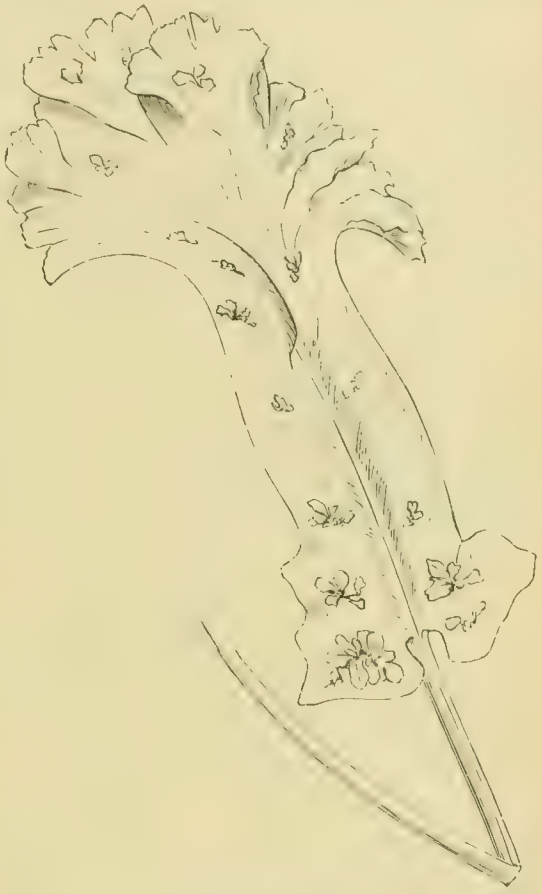


FIG. 666. FROND OF SCOLOPENDRIUM VULGARE CRISTATUM VIVIPARUM.

S. vulgare ramo-marginatum (branched, margined). Similar to the form *lato-digitatum*, but with the contracted and lined character of *marginatum* in the leafy portion and elsewhere.

S. v. scalariforme (ladder-shaped). A distinct, dwarf, seedling variety, with narrow, crested fronds, recurving at the tip. 1894.

S. v. Valloisii (Vallois'). A strong-growing variety, having the fronds dilated and irregularly divided and crested at their summit, forming large, bunch-like tufts. (R. H. 1836, p. 447, f. 114, under name of *S. officinale Valloisii.*)

FIG. 667. FROND OF SCOLOPENDRIUM VULGARE GRANDICEPS.

Scolopendrium—*continued.*

FIG. 668. FROND OF SCOLOPENDRIUM VULGARE RAMO-CRISTATUM.

In addition to the varieties of *S. vulgare* mentioned in this work there are many others (no less than seventy are grown at Kew), such as *S. v. cristatum* (Fig. 665) and its sub-variety *viviparum* (Fig. 666), *S. v. grandiceps* (Fig. 667), *S. v. ramo-cristatum* (Fig. 668), *S. v. sagittato-cristatum* (Fig. 669), and *S. v. sagittato-projectum* (Fig. 670). For further details the reader is referred to Druery's "British Ferns" and Schneider's "Book of Choice Ferns."

FIG. 669. FROND OF SCOLOPENDRIUM VULGARE SAGITTATO-CRISTATUM.

SCOLYTUS RUGULOSUS. *See* **Fruit-Tree Beetle.**

SCOPOLIA. To the information given on p. 395, Vol. III., the following should be added:

S. carniolica concolor (one-coloured). This differs from the type chiefly in having pale yellow, scentless flowers. Eastern Europe, 1893. SYN. *S. Hladnikiana* (G. C. 1893, xiii., p. 418, f. 60).

S. Hladnikiana (Hladnik's). A synonym of *S. carniolica concolor*. *Hladnickiana* and *Fladnichiana* are misspellings.

S. physaloides (Physalis-like). The correct name of *Physochlaina physaloides*.

SCOPOLIA (of Forster). A synonym of **Griselinia** (which *see*).

SCORCHING. The Scorching or burning of foliage, both under glass and outside, is due to the prevalence of dry heat and lack of moisture. Under glass, Vines in the early portion of the season quickly have the tender young foliage scorched unless the ventilation is carefully watched, especially in the mornings, when the sun suddenly breaks out with power, running up the internal temperature of the Vinery to a great height. Sometimes also the berries are scorched.

To avoid Scorching the ventilators should be opened early, if the weather is mild, giving only a little air at first, and gradually increasing the ventilation as the temperature rises, and reducing it if the thermometer falls. One of the gravest mistakes is to suddenly throw open the ventilators when the house is very hot to prevent Scorching and to lower the temperature. A violent check is given to the perspiring foliage, and mildew is sure to follow.

Scorching—*continued.*

FIG. 670. FROND OF SCOLOPENDRIUM VULGARE SAGITTATO-PROJECTUM.

SCORODOSMA. Included under **Ferula** (which *see*). *S. fœtidum* is a synonym of *F. Assafœtida*.

SCORPION SENNA. *See* **Coronilla Emerus.**

SCORPIUS SPINOSUS. A synonym of **Genista germanica** (which *see*).

SCORZONERA. *S. undulata* is now regarded as a form of *S. mollis*.

SCOTCH ASPHODEL. *See* **Tofieldia palustris.**

SCOTCH KALE. *See* **Borecole.**

SCOTCH LABURNUM. *See* **Laburnum alpinum.**

SCURVY GRASS (*Cochlearia officinalis*). A plant sometimes used as a Salad. It will thrive in any light, porous soil; the seeds germinate quickly if sown immediately they are ripe, at the end of June or early in July, in drills about 9in. apart, lightly covering them. When large enough to handle, the seedlings should be thinned out to about 9in. apart in the rows; if necessary, the thinnings may be planted out, and if watered will make good plants by the following spring, when the leaves will be ready to pick for use.

SCUTELLARIA. To the species described on pp. 398-9, Vol. III., the following should be added:

S. alpina bicolor (two-coloured).* *fl.* having the upper lip purplish and the lower one white. (R. H. 1892, 12.)

S. amœna (pleasing). *fl.* blue, large, resembling those of *S. baicalensis* (*S. macrantha*). *l.* oblong. China, 1896.

S. baicalensis (Baikal). The correct name of *S. macrantha*.

S. cordifolia (cordate-leaved). A synonym of *S. splendens*.

S. dependens (dependent). The correct name of *S. japonica* (of Morren).

S. formosana (Formosa). *fl.* dark violet-blue, green below, 1in. long, sub-secund, opposite, in a lax terminal raceme. Early summer. *l.* shortly petiolate, 2½in. to 3in. long, ovate or ovate-lanceolate, acuminate, faintly serrated. Stem 2ft. to 3ft. high. China, 1894. An erect, cool greenhouse shrub. (B. M. 7458.)

Scutellaria—*continued.*

S. grandiflora is a form of *S. orientalis.*

S. lupulina (wolf's). A form of *S. alpina.*

S. Trianæi. According to the "Index Kewensis," this is a distinct species, and not a variety of *S. incarnata.*

SCUTICARIA. *S. Dodgsoni* is a doubtful plant, probably identical with *S. Hadwenii.*

SCYPHÆA. A synonym of **Marila** (which *see*).

SEA ONION. *See* **Urginea maritima.**

SEA RAGWORT. *See* **Cineraria maritima.**

SEAFORTHIA. *See also* **Pinanga.** *S. robusta* (of gardens) is a synonym of *Rhopalostylis Baueri.*

SEAKALE. In addition to the old and well-known variety, there has been introduced a very meritorious sort under the name of Lily White. As its name indicates, it is of beautiful colour, and considered by connoisseurs to be of finer flavour than the old variety.

SEASIDE BALSAM. *See* **Croton Eluteria.**

SEASIDE LAUREL. *See* **Phyllanthus latifolius.**

SEBACEOUS. Wax-like or producing wax.

SECALE CEREALE. *See* **Tilletia.**

SECUND. One-ranked; unilateral; one-sided.

SECURINEGA. To the species described on p. 402, Vol. III., the following should be added:

S. ramiflora (branch-flowered). *fl.*, females solitary; males in depauperate fascicles. *l.* 1in. to 1½in. long, ovate-lanceolate, acuminate at both ends, glabrous, pale beneath. Branchlets numerous, densely leafy, tetragonal, pale yellowish. Eastern Asia. SYNS. *Phyllanthus ramiflorus, Xylophylla ramiflora.*

SEDUM. To the species and varieties described on pp. 403-7, Vol. III., the following should be added:

S. Alberti (Albert's). *fl.* white, disposed in a cymose panicle. July. *l.* terete, crowded at the ends of the branches. Stems procumbent. Turkestan, 1880. (R. G., t. 1019, f. 3.)

S. alboroseum (white and pink). *fl.* pure white, with pinkish stamens, ¼in. across; corymb 3in. to 4in. broad; lowest peduncles 2in. to 3in. long, with large bracts. *l.* close, in spirals of four, never opposite, oblong-spathulate, 2½in. long, incised-crenate in the upper two-thirds, glaucous-green. Stems several, 1½ft. long. Japan, 1860. (Ref. B., t. 33.) This is now regarded as a distinct species.

S. altissimum (tallest). *fl.* yellow, many in a branched, corymbiform cyme; petals six to eight, lanceolate, acute, spreading. June. *l.* almost terete, acute, glaucous, glabrous; upper ones scattered, nearly flat above. Stems suffruticose, branched at base; floriferous ones erect. *h.* 1ft. South Europe, 1769.

S. assoideum. A synonym of *S. dendroideum.*

S. brevifolium major (larger). A large form of the type.

S. cæspitosum (tufted). *fl.* white, tinged with red, few in lax, scorpioid cymes. *l.* close, oblong, obtuse, sessile, ascending, ¼in. long. Stem few-branched. *h.* 1in. to 3in. Mediterranean region. Annual. (Ref. B., t. 295.)

S. cordifolium. According to the "Index Kewensis," this is of specific rank, and not a form of *S. maximum.*

S. crassipes (thick-stalked). A synonym of *S. asiaticum.*

S. cyaneum (blue). *fl.* purplish, disposed in leafy cymes. *l.* thick, oblanceolate, blunt, opposite, entire. Stem simple. *h.* 4in. Eastern Siberia, 1879. A pretty, dwarf species. (R. G., t. 972, f. 2.)

S. dendroideum (tree-like). Tree Sedum. *fl.* yellow, sessile, bractless, unilateral, thyrsoid; petals five, lanceolate. June to August. *l.* scattered or opposite, obovate-cuneate, glabrous; those on the sterile branches forming a rosette. Stem shrubby, erect, branched. Mexico. Greenhouse. SYN. *S. assoideum.* This is a variety with variegated leaves.

S. ebracteatum (bractless). *fl.* yellowish-white, secund, sessile, bractless; cymes elongated, spicate, about six-flowered. *l.* sparse, glabrous, ovate, obtuse, thick. Flowering stems erect. *h.* 1ft. Mexico, 1865. Greenhouse. (Ref. B., t. 221.)

S. edule (edible). A synonym of *Cotyledon edulis.*

S. Englerianum (Engler's). A densely-tufted species, probably closely allied to *S. dasyphyllum.* Pyrenees, 1896.

S. erythrostictum is now regarded as a form of *S. Telephium,* and *S. alboroseum* as a distinct species.

S. Ewersii turkestanicum (Turkestan). A rosy-purple variety.

S. Fabaria (Fabaria). A sub-species of *S. Telephium.*

S. formosanum (Formosa). *fl.* bright yellow, mostly sessile, bracteate; petals lanceolate, acuminate, spreading. Summer.

Sedum—*continued.*

l. one to three, whorled, 1in. to 1¼in. long, ⅛in. broad, flat, spathulate, obtuse, recurving towards the apex, softly succulent. Stem repeatedly branched from near the base. *h.* about 6in. Formosa, 1885. A glabrous, half-hardy or greenhouse annual.

S. Forsterianum (Forster's). A variety of *S. pruinatum.*

S. glanduliferum (gland-bearing). A variety of *S. dasyphyllum.*

S. maximum purpureum (purple). A pretty variety with purple leaves.

S. obtusifolium (obtuse-leaved). *fl.* white, sub-sessile, secund; cyme-branches two or three, spreading, lax. *l.* sessile, reticulately red-veined, very obtuse, obsoletely crenulate; lower ones 1in. to 1¼in. long. Stems erect, rather thick, woody below, 2½in. to 3in. high, densely leafy as far as the cyme. Orient. A remarkable species.

S. oreganum (Oregon). *fl.* pale rose-coloured, in a compound cyme; petals over ½in. long, linear-lanceolate, much acuminate; stamens ten; pedicels short. *l.* all scattered, spathulate, rounded at apex. Stems erect, simple. North America. Plant glabrous, not glaucous.

S. pallidum (pale). *fl.* white or pink, five-parted, sub-sessile; petals acute, thrice as long as the sepals; cyme-branches minutely glandular. July. *l.* 1in. long, oblong to linear. Stems 1in. to 5in. long, annual, solitary. India to Greece, 1817. The variety *roseum* has pink flowers.

S. purpurascens (purplish). A sub-species of *S. Telephium.*

S. roseum (rosy). According to the "Index Kewensis," this is the correct name of *S. Rhodiola.*

S. rubens (reddish). *fl.* pinkish-white, small, in cymes with lax, scorpioid branches 2in. to 3in. long. *l.* crowded, sessile, linear, erecto-patent, semi-cylindrical, ½in. to ¾in. long on the main stem, glaucous-green, more or less tinged with red. Stems erect, 3in. to 4in. high. South Europe, Asia Minor, &c. Annual. (Ref. B., t. 242.)

S. rupestre grandiflorum (large-flowered).* A beautiful, dwarf variety with crimson-shaded leaves.

S. Sempervivum (Sempervivum). A synonym of *S. sempervivoides.*

S. stoloniferum atrosanguineum (dark red). A deep purple-red variety.

S. Telephium purpurascens (purplish). *fl.* rose or purplish, in a terminal, compact corymb. August and September. *l.* obovate or oblong. Stems strong. France, &c.

S. Wallichianum (Wallich's). This is closely allied to *S. asiaticum*; it differs chiefly in having broader, more denticulate, sometimes almost bipinnatifid leaves. Himalayas.

SEEDLING. A plant produced from seed, especially a very young plant.

SEED-ROOM. The most essential point in making a Seed-Room is the exclusion of moisture, as dampness causes the seeds to start germination, and when sown some time afterwards they probably prove a failure. It is, therefore, important that the room should be so built that it can be relied upon to be always dry. Extremes of temperature are of comparatively little account provided moisture is absent.

SEEMANNIA. According to the "Index Kewensis," *S. ternifolia* is the correct name of *S. silvatica,* and *S. Benaryi* is a distinct species.

SELAGINELLA. Most Selaginellas are of very easy culture, and as a rule invaluable for decorative purposes; their elegance can hardly be overrated, and their powers of endurance in many instances prove sufficiently satisfactory to enable growers to utilise them for decoration. They are readily propagated from cuttings made from their creeping stems, which emit roots at nearly every joint. The layering of the fronds by pegging firmly on a constantly damp, mossy surface is a rapid method of producing very handsome plants, and this operation may be performed with equal success at almost any time of the year. In private establishments especially, where the demand for decorative plants is great, and where greater difficulties are encountered in the propagation of Ferns, these useful plants may be increased at a rapid rate, and with comparatively little trouble.

With very few exceptions, Selaginellas require a warm, close, moist atmosphere, where draughts are carefully excluded, although some of them are quite at home in a temperate house, and a few are even hardy in a sheltered position out of doors. The temperature most suitable for the bulk of them is from 65deg. to 70deg., and they will, by growing more luxuriantly, give even more satisfaction

Selaginella—*continued.*

if the atmosphere can be kept at from 70deg. to 75deg. all the year round.

There are various ways of growing Selaginellas. They delight in any light soil, and it should be kept open by

FIG. 671. SELAGINELLA PERELEGANS.

intermixing charcoal or small potsherds through it. Growing them in shallow pans is the best method of cultivation, as, with the exception of the plants belonging to the *rosulatæ* section, they all require room to spread, and most of them root upon the surface of the soil only. They should be kept on the shady side, or at one end of the house; in any case it will be found beneficial to have them in such a position that there may be a certain amount of constant moisture about them. To that effect, they should be placed on a solid bed which constantly gives off moisture, or, if this is impracticable on account of the house being provided with permanent stages, these should be covered with sphagnum, to be kept wet; and the pans should not be allowed to rest directly on the moss, but be set up above it upon three small pots or on an inverted pan, so as to avoid all direct contact with the saturated material. Plants so arranged will derive all the benefit of the surrounding moisture without their soil becoming sour. Although they have a particular dislike to standing permanently in the wet, Selaginellas require copious waterings at the roots, and for that reason it is necessary that their pots or pans shall be thoroughly well drained. They should not be syringed overhead, or only very sparingly during the hot summer days, as their massive though feathery fronds cannot long endure being wetted.

To the species described on pp. 409-12, Vol. III., the following should be added:

S. albospica (white-spiked). A form of *S. stenophylla.*

S. Bakeriana (Baker's).* *stems* trailing, 6in. to 9in. long; lower branches copiously compound. *l.* bright green; those of the lower plane spaced, spreading, oblong, obtuse, $\frac{1}{12}$in. long; leaves of the upper plane half as long, ascending, acute. *spikes* very copious, slender, square, 1in. to 2in. long. Queensland. SYN. *S. leptostachya.* Greenhouse. A pretty species.

S. bulbifera (bulb-bearing). *stems* decumbent, sending out copious root-fibres in the lower half; many of the lower branchlets excurrent and whip-like at the tip, and bearing bulbils, which reproduce the plant. *l.* not distinctly ciliated. 1867. Stove or greenhouse. "Probably a form of *S. radiata*, produced by cultivation in a damp, warm atmosphere" (Baker).

Selaginella—*continued.*

S. caulescens gracilis (slender). *stems* distantly branched, bright green. 1880. An elegant, dwarf variety.

S. c. minor (lesser). A synonym of *S. c. japonica.*

S. concinna (neat). *stems* trailing, 1ft. or more in length, copiously pinnately branched; lower branches flabellately compound. *l.* of the lower plane crowded, ascending, oblong-lanceolate, $\frac{1}{12}$in. to $\frac{1}{8}$in. long, glossy, rigid, much dilated at base; leaves of the upper plane one-third as long, much imbricated, with a long cusp. *spikes* $\frac{1}{2}$in. to 1in. long, square; bracts cuspidate, strongly keeled. Mascarene Islands. Stove.

S. cuspidata crispa (curled). A charming form, differing from the type in its crisped stems. 1888.

S. c. Emiliana (Emilie's).* *stems*, branches 6in. to 9in. long, abundantly produced and copiously divided, of a pleasing light green, erect when young, becoming darker and horizontal. Very handsome, bushy plants of this fine variety can be grown in comparatively small pots.

S. denticulata (of gardens). A synonym of *S. Kraussiana.*

S Douglasii (Douglas's). *stems* trailing, 3in. to 6in. long, pinnately branched; lower branches copiously compound. *l.* of the lower plane pale, firm, broadly oblong, obtuse, $\frac{1}{12}$in. long, auricled and ciliated at base, the upper side much imbricated over the stem; leaves of the upper plane half as long, cuspidate. *spikes* $\frac{1}{2}$in. to 1in. long; bracts cuspidate, much imbricated. British Columbia, &c. Greenhouse.

S. Emiliana (Emilie's). A form of *S. cuspidata.*

S. gracilis (slender).* *stems* 2ft. to 3ft. long, sub-erect, pinnately branched, rather rough; pinnæ narrow-lanceolate, 4in. to 5in. long; pinnules simple, the lower ones 1in. long, $\frac{1}{4}$in. broad. *l.* bright green, ovate-falcate; stipular ones narrow-lanceolate, cuspidate, parallel and close-set. *spikes* terminal, tetragonal, $\frac{1}{2}$in. to 1in. long. South Sea Islands, 1886. An elegant, stove species.

S. Griffithii (Griffith's). *stems* erect, 6in. to 12in. long, simple below, deltoid and decompound upwards; lower pinnæ tripinnate; final branchlets $\frac{1}{4}$in. to $\frac{1}{2}$in. long. *l.* of the lower plane ascending, oblong-rhomboid, $\frac{1}{8}$in. to $\frac{1}{4}$in. long, dilated, serrulated, and imbricated; leaves of the upper plane minute, with a large cusp. *spikes* square, $\frac{1}{4}$in. to $\frac{1}{2}$in. long; bracts cuspidate, strongly keeled. Tropical Asia, 1860. Stove.

S. leptostachya (slender-spiked). A synonym of *S. Bakeriana.*

S. longissima (longest). *stems* 2ft. or more in length; branches deltoid, 6in. to 9in. long, with ascending simple upper and slightly compound lower branchlets; ultimate divisions 2in. to 2½in. long. *l.* of the lower plane close, oblique, ovate-oblong, acute, $\frac{1}{8}$in. long, the upper side strongly ciliated at base; leaves of the upper plane one-third as long, nearly erect, obscurely cuspidate. *spikes* terminal on the branchlets, square, 1in. to 2in. long; bracts erecto-patent, strongly keeled. Colombia, &c., 1881. Stove.

FIG. 672. SELAGINELLA TASSELLATA.

S. Mettenii (Mettenius'). *stems* slender, wide-trailing, distantly pinnate; branches short, flabellately compound. *l.* of the lower plane nearly contiguous on the branches, the upper ascending, the lower spreading, obtuse, $\frac{1}{8}$in. long, bright green, not imbricated over the stem; leaves of the upper plane one-third as

Selaginella—*continued.*

long, not cuspidate. *spikes* square. 1865. Greenhouse. Supposed to be a garden hybrid between *S. uncinata* and *S. inæqualifolia*.

S. oregana (Oregon).* *stems* pendent, flaccid, 1ft. to 6ft. long, pinnate, much-branched. *l.* uniform, linear-lanceolate, convex and grooved at back, sparsely denticulate, scarcely $\frac{1}{12}$in. long, acute, but not bristle-tipped. *spikes* square, very slender, resembling the sterile branchlets. Oregon. Greenhouse. A beautiful species.

S. perelegans (very elegant). The correct name of this plant is *S. inæqualifolia perelegans* (under which it is described on p. 411, Vol. III.). See Fig. 671, for which we are indebted to Messrs. W. and J. Birkenhead.

S. Pervillei (Perville's). A synonym of *S. Vogelii*.

S. Pitcheriana (Pitcher's). A form of *S. erythropus*.

S. radiata (radiate).* *stems* slender, sub-erect, 6in. to 12in. long, acutely angled down the face, closely pinnate, sometimes stoloniferous at base; branches copiously compound. *l.* of the lower plane contiguous on the branchlets, spaced on the main stem, erecto-patent, ovate, acute, $\frac{1}{4}$in. to $\frac{1}{12}$in. long, much imbricated on the upper side at base, strongly ciliated; leaves of the upper plane half as long, cuspidate. *spikes* square, $\frac{1}{4}$in. to 1in. long. Tropical America (up to 9000ft.). Stove or greenhouse. SYN. *S. Warscewiczii*.

S. radicata (rooting). A synonym of *S. plumosa*.

S. spinulosa (slightly spiny). A synonym of *S. spinosa*.

S. stenophylla (narrow-leaved). *stems* pale straw-coloured, sub-erect, 6in. to 12in. long, rooting from the lower half, copiously pinnate; lower branches copiously compound. *l.* of the lower plane ascending, oblong-lanceolate, $\frac{1}{12}$in. to $\frac{1}{8}$in. long, serrulated and imbricated on the upper side; leaves of the upper plane one-third to half as long, cuspidate. *spikes* resupinate, short. Mexico. Stove. *S. albospica* is a form of this species.

S. tassellata (tasselled).* *stems* erect; branches and branchlets flat, closely pinnate, the tips furnished with fertile, quadrangular spikes about 1½in. long, giving the plant a tasselled appearance. Brazil, 1837. Stove. See Fig. 672, for which we are indebted to Mr. Wm. Bull.

S. uliginosa (swamp-loving). The correct name of *Lycopodium uliginosum*.

Selaginella—*continued.*

S. usta (burnt). *stems* 9in. to 12in. long, erect, simple at base, compound above; branches erecto-patent, the upper ones copiously compound. *l.* of the lower plane crowded, erecto-patent, bright green, rigid, dilated, serrulated, imbricated on the upper side at base; leaves of the upper plane one-third as long, acute, much imbricated. *spikes* square, $\frac{1}{4}$in. to $\frac{1}{2}$in. long. New Caledonia. Stove.

S. Victoriæ (Victoria's). Of this lovely species, intermediate between *S. Wallichii* and *S. caniculata*, a portion of a stem is shown at Fig. 673 (for which we are indebted to Mr. Bull).

S. viridangula (green-angled).* *stems* sub-erect, sarmentose, 3ft. to 4ft. long; pinnæ deltoid, 1ft. long, erecto-patent; pinnules with simple upper and compound lower erecto-patent tertiary divisions; ultimate segments usually $\frac{1}{2}$in. to 1in. long, bright green at base. *l.* of the lower plane contiguous or nearly so on the branchlets, lanceolate-falcate, acute, $\frac{1}{8}$in. to $\frac{1}{4}$in. long ($\frac{1}{4}$in. long and much spaced on the pinnæ), bright green, dilated; leaves of the upper plane very small, distinctly cuspidate. *spikes* square, 1in. to 2in. long; bracts strongly keeled. Mountains of Fiji, 1884. Stove.

S. Warscewiczii (Warscewicz's). A synonym of *S. radiata*.

FIG. 673. PORTION OF STEM OF SELAGINELLA VICTORIÆ.

SELAGO. Several species formerly included here are now classed under **Microdon** (which *see*). *S. myrtifolia* is the correct name of *S. Gillii*.

SELENIPEDIUM. Under *Cypripedium* the various hybrids of *Selenipedium* will be found, with their recorded parentage. So far as these are concerned, they are amongst the most difficult Orchids to grow. Many of the most familiar, such as *S. caudatum* (Fig. 674), *S. caricinum*, *S. Lindleyanum*, and *S. Schlimii*, are but seldom met with in perfection. This is the more pronounced and inexplicable from the fact that, almost without exception, the hybrids that have been derived from the intercrossing of the species are about the most tractable Orchids in cultivation. There is certainly no freer and more vigorous class of Orchids under almost any conditions than the majority of the *Selenipedium* hybrids. Their requirements are best met by growing them with the intermediate section of Cypripediums. They require a liberal supply of moisture, both at the roots and in the atmosphere, at all seasons of the year.

Selenipedium—*continued.*

To the species and varieties described on pp. 413-4, Vol. III., the following should be added:

S. Boissierianum (Boissier's). *fl.* yellow, veined and tinged with bright green, marked brownish-crimson on the edges of the sepals and in other places; petals curiously twisted and horizontally extended, the edges erose; lip rounded. Peru, 1887. (G. C. 1887, i., p. 143.) *S. reticulatum* is a form of this.

S. caudatum giganteum (gigantic).* *fl.*, upper sepal white, spotted with yellow; petals 10in. long, white, with dark green reticulation, blackish-brown outside; lip pure white within, with a yellow ring round the border. A fine variety. (L. ii., t. 96.)

S. Dalleanum (Dalle's). *fl.* large; upper sepal 2½in. long; petals 5in. long; lip deep glossy carmine-red, oblong, smooth. *l.* lorate, acute, 1½ft. to 2ft. long. Stems cylindrical, pubescent, 20in. high. Habitat not recorded, 1895. (R. H. 1895, p. 548, f. 180.)

S. Hartwegii (Hartweg's). A synonym of *S. Roezlii.*

FIG. 674. SELENIPEDIUM CAUDATUM WALLISII.

S. Hincksianum is a form of *S. longiflorum.*

S. Lindeni is a variety of *S. caudatum.*

S. palmifolium (palmate-leaved). *fl.* about twenty-five or thirty to a scape; sepals and petals yellow; lip citron-yellow. Stems leafy, attaining 3ft. in height. French Guiana. A very rare species.

S. Parishii (Parish's). A synonym of *Cypripedium Parishii.*

S. reticulatum is a form of *S. Boissierianum.*

S. Sargentianum (Sargent's). This species closely resembles *S. Lindleyanum* in flowers, foliage, and habit; it differs chiefly in having a pair of small, white tubercles on the inner margin of the side lobes of the lip. Brazil, 1893. (B. M. 7446; G. C. 1894, ii., f. 100.)

S. Schröderæ splendens (splendid).* A very brilliant variety. 1887. (L. ii., t. 69.)

S. Sedeni Weidlichianum (Weidlich's). *fl.* clear rose-colour and white, freely produced. 1893. A capital, winter-flowering variety. (R., t. 51.)

Selenipedium—*continued.*

S. Wallisii (see Fig. 674) is now regarded as a variety of *S. caudatum*

S. Warscewiczii (Warscewicz's) A synonym of *S. caudatum roseum.*

SELF. A term applied to a flower (or a plant) which is wholly of one colour.

SEMPERVIVUM. To the species, &c., described on pp. 416-9, Vol. III., the following should be added. The changes in nomenclature are based on the "Index Kewensis."

S. anomalum is probably a form of *S. pumilum.*

S. arachnoideum. *S. piliferum* and *S. Webbianum* are forms of this species.

S. barbatulum, S. Doellianum, and **S. Fauconneti** are varieties of *S. arachnoideum.*

S. Boutignyanum is given as a form of *S. arvernense* by some; but at Kew it is kept as distinct.

S. grandiflorum and **S. soboliferum** are forms of a species called *S. globiferum.*

S. Heuffelii is a form of *S. patens.*

S. Lamottei, S. parvulum, and **S. Reginæ-Amaliæ** are forms of *S. tectorum.*

S. Lindleyi (Lindley's). The correct name of *S. villosum.*

S. Mettenianum (Metten's). *fl.* rosy-white, on stems 4in. to 6in. high. Summer. *l.* in medium-sized rosettes, fringed, reddish in autumn. European Alps. A neat little plant for the rockery, thriving in a loamy soil.

S. Monanthes. The correct name is *Monanthes polyphylla.*

S. Neilreichii (Neilreich's). A form of *S. arenarium.*

S. patens (spreading). *fl.* yellowish; petals erect. *l.* rosulate, obovate-oblong, abruptly cuspidate, glaucous, hairy. Eastern Europe. (R. G., t. 858, f. 2.) *S. Heuffelii* is merely a form of this species.

S. piliferum (hair-bearing). A form of *S. arachnoideum.*

S. pulchellum (rather pretty).* *fl.* pink; cymes compact, many-flowered. *l.* obovate-oblong, obtuse, viscid, lineolate beneath, dotted with red and shortly hairy on both surfaces; rosettes 1½in. in diameter. Habitat not recorded. A glabrous shrub.

S. Requieni (Requien's). A garden synonym of *S. tectorum rusticum.*

S. Schottii is a form of *S. glaucum.*

S. spinosum (spiny). A synonym of *Cotyledon spinosum.*

S. tectorum. *S. Lamottei, S. parvulum,* and *S. Reginæ-Amaliæ* (described as species in Vol. III.) are varieties of this species. *S. t. rusticum* is a glaucous form, with very large rosettes. (SYN. *S. Requieni,* of gardens).

S. Thomeyeri (Thomeyer's). A garden hybrid between *S. hirtum* and *S. arachnoideum.* 1892.

S. Verloti is a variety of *S. Pomelii.*

S. villosum. The correct name is *S. Lindleyi.*

S. Webbianum (Webb's). A garden name for a form of *S. arachnoideum.*

SENECILLIS. Included under **Senecio** (which *see*).

SENECIO. Including *Delairia.* To the species described on pp. 419-21, Vol. III., the following should be added:

S. abrotanifolius (Southernwood-leaved). A synonym of *S. adonidifolius.*

S. adonidifolius (Adonis-leaved).* *fl.-heads* brilliant orange, showy, disposed in a compound corymb. July. *l.* petiolate, pinnatisect, much-cleft; lobes linear, acute, deep green. Stems erect, terete, simple, 1ft. to 1½ft. high. South Europe, 1800. A neat, glabrous, hardy perennial. SYNS. *S. abrotanifolius, S. artemisiæfolius.*

S. alpestris (Alpine). The correct name of *Cineraria alpestris.*

S. artemisiæfolius (Artemisia-leaved). A synonym of *S. adonidifolius.*

S. aurantiaca (orange). The correct name of *Cineraria aurantiaca.*

S. auriculatissimus (prominently auricled). *fl.-heads* golden-yellow, 1in. across, pedicellate, in lax, terminal corymbs.

Senecio—*continued.*

February. *l.* transversely oblong, 2in. to 2½in. broad, obreniform, or orbicular-reniform; petioles 1in. to 2in. long, slender, dilated at base into a convex auricle over 1in. long. British Central Africa, 1898. A remarkable and attractive, greenhouse, climbing shrub. (B. M. 7731.)

S. Balbisianus (Balbis'). Piedmont Groundsel. The correct name of *Cineraria longifolia* (of Allioni).

S. brachychætus (short-bristled). The correct name of *Cineraria longifolia.*

S. calamifolius (Calamus-leaved). A synonym of *S. scaposus caulescens.*

S. candicans (whitish). *fl.-heads* insignificant, seven or eight in a sub-umbellate corymb. *l.* large, entire, leathery; radical ones petiolate, ovate, crenate; upper ones sessile, elliptic-oblong. Stem herbaceous, erect, simple, woolly. Falkland Islands, 1898. Hardy.

S. carniolicus (Carniolan). *fl.-heads* yellow, twice the size of those of *S. incanus*; pedicels elongated; corymb simple. *l.* oblong, narrowed to the petioles, incised-sub-pinnatifid; lobes entire. Stems ascending from the base, simple, somewhat tufted. Alps. A cobwebby-woolly, hardy perennial.

S. Cineraria. The correct name of *Cineraria maritima.*

S. Claussenii (Claussen's). *fl.-heads* orange-yellow, rather large, five or six in a corymbiform raceme at the tip of an axillary peduncle 3½in. to 6in. long. Autumn. *l.* deeply sinuate-lobed; lobes acute, covered when young, and especially beneath, with an abundance of silvery, cottony wool, as is the whole of the plant more or less. Stems bushy. *h.* 2ft. Brazil, 1855. Greenhouse or half-hardy.

S. Correvonianus (Correvon's). *fl.-heads* yellow, handsome, disposed in a panicle at the summit of a bare stem. *l.* coriaceous, reniform or cordate, borne on long petioles. Caucasus, 1897. Hardy, alpine perennial.

S. cruenta (blood-red). The correct name of *Cineraria cruenta.*

S. ficoides (Ficus-like). *fl.-heads* white, disposed in paniculate corymbs; involucre cylindrical, with seven or eight scales. July to November. *l.* fleshy, nerveless, compressed, acuminate, glaucous-pruinose. Stem fleshy-shrubby. South Africa, 1710. Greenhouse. SYN. *Kleinia ficoides.*

S. Galpini (Galpin's). *fl.-heads* of a brilliant orange-colour, disposed in a lax corymb on a leafy stem 1ft. high. *l.* fleshy, glaucous, oblanceolate. Barren stems short, compact, tufted. Transvaal, 1892. A greenhouse species, of the section *Kleinia.* (B. M. 7239.)

S. Gunnisii (Gunnis'). A synonym of *S. pendula.*

S. Hanburianus (Hanbury's). *fl.-heads* pale yellow, disposed in loose cymes. *l.* chordiform, about 1ft. long. Stem fleshy, branched, 5in. long. South Africa (?), 1898. Stove. Said to be a new species, allied to *S. chordifolius.*

S. Heritieri (L'Héritier's). *fl.-heads* bright purple and white, radiate; involucral scales fifteen to twenty; peduncles one-headed, scarcely longer than the petioles. Spring. *l.* petiolate, somewhat cordate-orbicular, five- to seven-lobed, ¾in. in diameter, white-woolly beneath. Teneriffe, &c., 1843. Greenhouse shrub. (G. & F. 1891, iv., p. 510, f. 79.) SYNS. *Cineraria aurita* (Gn. xxxviii., p. 252, t. 770), *C. lanata* (B. M. 53).

S. Hualtata (Chilian native name). *fl.-heads* 1in. across, shortly pedicellate, in crowded clusters at the ends of the naked branches of a panicle 1ft. to 2ft. high; ray florets twelve to sixteen, pale straw-coloured; disk golden-yellow. June. *l.* chiefly radical, 1ft. to 1½ft. long, oblong-ovate, bluish-green or purplish beneath. *h.* 5ft. Chili and Argentina, 1890. Hardy perennial. (B. M. 7422.)

S. japonicus (Japanese). The correct name of *Ligularia japonica.*

S. kleinioides (Kleinia-like). This species resembles *S. Anteuphorbium*, but has smaller flower-heads and flat obovate leaves; florets thirteen to twenty-two, all tubular, half as long again as the involucre. Abyssinia, 1894. A glabrous, greenhouse shrub.

S. latifolius (broad-leaved), of Masters. A synonym of *S. laxifolius.*

S. laxifolius (lax-leaved). *fl.-heads* yellow, about 1in. across, in very loose, terminal, somewhat corymb-like panicles; ray florets twelve to fifteen, elliptic-oblong. June. *l.* 1½in. to 2½in. long, usually elliptic- or linear-oblong, entire; petioles ¼in. to ¾in. long. New Zealand, 1894. A small, much-branched, greenhouse shrub. (B. M. 7378; Gn. 1895, ii., 1008.) SYN. *S. latifolius*, of Masters (G. C. 1894, ii., f. 43).

S. Ledebourii (Ledebour's). The correct name of *Ligularia macrophylla.*

S. leucostachys (white-spiked). A greenhouse or half-hardy, tufted under-shrub, with white-tomentose leaves, much in the way of *S. Cineraria* (*Cineraria maritima*), but elegantly pinnatisect. Uruguay, 1893. (B. H. 1893, f. 37.)

Senecio—*continued.*

S. lilacinus (lilac). Although closely related and from the same country, this is considered specifically distinct from *S. glastifolius.*

S. longipes (long-stalked). *fl.-heads* scarlet, hemispherical, 2in. in diameter; pedicels three, green, scaly; peduncle terminal, 10in. high. June. *l.* crowded, spreading and recurved, thickly fleshy, 2in. to 2½in. long, ovate to spathulate-oblong, obtuse, entire. Stem 6in. to 8in. long, decumbent, copiously leafy. Eastern tropical Africa, 1899. A glabrous, stove herb. SYN. *Kleinia Grantii* (B. M. 7691).

S. macrophyllus (large-leaved).* *fl.-heads* yellow, numerous, disposed in loose, terminal corymbs; ray florets five. August. *l.*, lower ones ample, oblong-obovate, obtuse, on long, winged petioles; upper ones sessile, amplexicaul. Stems robust, 6ft. in height. Orient, 1896. Hardy perennial, something in the way of *S. Doria.* (R. H. 1896, f. 31.)

S. multiflorus (many-flowered). *fl.-heads* lilac-purple, numerous, in a compound, paniculate corymb; involucral scales twelve to fifteen. Summer. *l.* 3in. in diameter, cordate-reniform, slightly angled, scarcely toothed, nearly glabrous above, tomentose beneath; petioles 3in. long, dilated at base. Stems erect, glabrous. *h.* 3ft. Canary Isles, 1853. Half-hardy perennial. SYNS. *Cineraria multiflora, Doronicum Bourgæi* (B. M. 4994).

S. Palmeri (Palmer's). *fl.-heads* few, with yellow rays, about 1in. in diameter, disposed in a pedunculate corymb. *l.* oblong-lanceolate, slightly toothed, narrowed into rather long petioles. *h.* 1ft. to 2ft. Guadeloupe Island, Lower California, 1890. Greenhouse perennial or hardy annual, densely clothed with white felt.

S. pendulus (pendulous). *fl.-heads* bright vermilion mixed with orange-colour, depressed, about 1½in. across, peduncles 3in. or more in length. October. *l.* ¼in. long, produced only at the growing tips of the young joints. Stem consisting of a few curved or crooked, cylindrical joints each 4in. to 15in. long, obtuse, fleshy. Somaliland, &c. A singular, greenhouse species. SYNS. *S. Gunnisii, Kleinia pendula* (B. M. 7659).

S. Petasites (Petasites).* *fl.-heads* yellow, small and very numerous, disposed in a very large, thyrsoid, terminal panicle. Summer and autumn. *l.* petiolate, ample, rather thick, rounded-cordate at base, with five to seven angular lobes, dark green above, pale beneath. Stem robust, fleshy, slightly branched, shrubby at base. *h.* 3ft. to 4½ft. Mexico. Greenhouse. SYNS. *S. platanifolius* (of gardens), *Cineraria Petasites.* (B. M. 1536.)

S. platanifolius (Plane-leaved). A garden name for *S. Petasites.*

S. populifolius (Poplar-leaved). *fl.-heads* having lilac-white rays and a yellow disk, disposed in a branched, nearly regular corymb. Spring and summer. *l.* petiolate, ovate-cordate, toothed, angular, glabrous and green above, white-tomentose beneath. Stems numerous, bushy, somewhat woody at base. *h.* 2ft. Canary Islands. Greenhouse.

S. repens (creeping). *fl.-heads* few, corymbose. June. *l.* fleshy, glaucous, oblong, acuminate. Stems fleshy, woody below. Roots creeping. South Africa, 1710. A glabrous, greenhouse species, smaller and more glaucous than *S. ficoides*, which it closely resembles. SYN. *Kleinia repens.*

S. sagittatus (arrow-shaped). The correct name of *Cacalia hastata.*

S. sagittifolius (arrow-leaved).* *fl.-heads* 1¼in. in diameter, with a cream-white ray and a yellow disk; panicle many-flowered, at the tip of a simple floral stem 7ft. to 10ft. high, clothed with small amplexicaul leaves. *l.*, radical ones disposed in a rosette, 3ft. long, 1ft. to 1½ft. broad, sagittate, acute, with two leafy, crest-like processes along the midrib. Uruguay, 1892. A highly decorative and remarkable, greenhouse species. (B. M. 7322; G. C. 1893, i., f. 50; R. H. 1892, p. 53, f. 16, 17.)

S. scandens (climbing). A garden synonym of *S. mikanioides.*

S. Smithii (Smith's).* *fl.-heads* white, many in a leafy, terminal panicle; ray florets twenty to thirty, very variable, ¼in. to ¾in. long. June. *l.*, lower ones 8in. to 10in. long, ovate or oblong, cuneate to bilobed at base, on very stout petioles; upper ones sessile, oblong. Stem as thick as the thumb. *h.* 3ft. to 4ft. South Chili and Fuegia, 1895. A noble, hardy perennial. (B. M. 7531.) SYN. *Cineraria gigantea* (S. E. B. ii., part ii., t. 65).

S. spathulæfolius (spathulate-leaved). *fl.-heads* orange-yellow, about as large as a shilling, many in a simple corymb; involucre woolly. *l.*, radical ones ovate, broadly petiolate; cauline ones sessile, lanceolate; all slightly toothed. Stem herbaceous, erect. *h.* 6in. to 12in. Alps, &c. A rather pretty, woolly-floccose, hardy species.

S. venustus (charming). A synonym of *S. grandiflorus.*

SENSITIVE FERN. *See* **Onoclea sensibilis.**

SEPTORIA CHRYSANTHEMI. *See* **Chrysanthemum Leaf Spot.**

SEQUOIA. Wellingtonias, in common with some other coniferous subjects, are attacked by a fungoid disease, a *Botrytis*-form of *Sclerotinia Fuckeliana*. The greyish mould is very familiar, as it is found upon a variety of subjects. Young trees are the victims, the fungus attacking the main shoots. All diseased trees should be taken up and burned, and the remainder thoroughly sprayed with weak Bordeaux Mixture.

To the species and varieties described on p. 422, Vol. III., the following should be added:

S. gigantea pyramidata compacta (pyramidal, compact). A garden form, of compact, pyramidal growth. 1891.

S. sempervirens variegata (variegated). A form differing from the type in having highly glaucous and slightly variegated foliage. 1890.

SERAPHYTA. *S. multiflora* is the correct name of *S. diffusa*.

SERIOLA. Included under **Hypochæris** (which *see*).

SERRASTYLIS (from *serra*, a saw, and *stylis*, a style; in allusion to the toothed wings of the column). ORD. *Orchideæ*. A monotypic genus. The species is a stove Orchid allied to *Brassia* and with the habit of *Trichopilia*. It will probably thrive under the treatment recommended for **Oncidium.**

S. modesta (modest). *fl.* 1in. in diameter, numerous, in a drooping raceme 5in. long; sepals and petals reddish, edged with yellow; lip white, with a few purple streaks; column having two large, wing-like auricles, the side lobes of the lip similarly formed. *l.* solitary, broadly lanceolate. Pseudo-bulbs linear-oblong. Colombia, 1893. (G. C. 1894, xvi., p. 726, f. 91.)

SERRATULA. Other species formerly included hereunder are now referred to **Jurinea, Pluchea,** and **Saussurea.**

SERRATURE. One of the teeth of a serrated margin.

SESBANIA. To the species described on p. 425, Vol. III., the following should be added:

S. exasperata (roughening). *fl.* golden-yellow, with red spots on the back of the standard, large, papilionaceous, disposed in short racemes. *l.* 6in. to 10in. long. Branches slender. *h.* 8ft. to 10ft. Tropical America, before 1894. (B. M. 7384.)

S. platycarpa is the correct name of *S. vesicaria*.

S. Tripetii (Tripet's). *fl.* in drooping racemes; standard scarlet, much paler on the inner face, with a yellow spot on the claw; wings and keel palish red. June to October. *l.* dull green above, glaucescent beneath. *h.* 6ft. Brazil and Argentina. Greenhouse. SYN. *Daubentonia Tripetii*.

SESIA TIPULIFORMIS. *See* **Currant Clear-wing Moth** or **Currant Borer.**

SETACEOUS. Bristle-like.

SETARIA ITALICA. The correct name of **Panicum italicum** (which *see*).

SETS. In some parts of the country the tubers of Potatoes, Dahlias, and similar things are termed "Sets." These may be whole or parts of Potatoes. In some parts cut Sets are preferred, and in others whole Sets.

SETTING. The fertilisation of the female blossom with the pollen from the male blossom is known as Setting. When certain varieties of Melons, Tomatoes, and Grapes are naturally more or less shy in producing fruit, although producing plenty of female flowers, they are known as shy Setters.

SEWERZOWIA should be included under *Astragalus*, and the correct name of *S. turkestanica* is *A. Schmalhauseni*.

SHANKING. The cause of Shanking—*i.e.*, the drying up of the stems of the berry of the Grape, the stems of young plants of the *Brassica* family and many other plants—is somewhat difficult to determine, as so many things contribute to the condition. With Grapes, the following are amongst the principal contributory causes: careless or bad ventilation of the Vineries, such as sudden draughts of cold air after the house had become very heated; too much or too little water at the roots; extremes in the atmospheric moisture of the house; bad drainage; exhaustion of the soil or of some element therein, particularly lime; over-rich soil, or the application of too much natural or chemical manures, and the

Shanking—*continued.*

passing of the roots out of the prepared border into some unsuitable material or soil.

Shanking will appear in the berries at various stages, sometimes when they are quite small and no larger than Peas, often at the stoning period, and also when the fruit is commencing to colour. When the latter occurs it is usually produced by over-cropping the Vines. When the stems of young Cauliflower, Lettuce, &c., Shank in frames early in the season, it is largely due to over-crowding or insufficient ventilation. In the open ground, frost, a lack of lime or potash, and overcrowding will cause the stems to Shank. Or the collapse of stems may be due to a fungus. *See* **Damping Off.**

FIG. 675. SHIRLEY POPPIES.

SHARP CEDAR. *See* **Acacia oxycedrus** and **Juniperus oxycedrus.**

SHE OAK. *See* **Casuarina stricta.**

SHEEP LAUREL. *See* **Kalmia angustifolia.**

SHEK-IN. *See* **Primulina Tabacum.**

SHELLS. These are all useful as a manure when pounded up, the roots showing their appreciation by clinging round the broken pieces, no doubt for the lime and other useful constituents contained therein. Oyster-shells are excellent for many plants, such as Chrysanthemums, for drainage, and supply a certain amount of plant-food at the same time.

SHEPHERDIA. *S. argentea* is in gardens often confused with *Elæagnus argentea*, which is a distinct, although related, plant.

SHEPHERD'S BEARD. *See* **Urospermum.**

SHEPHERD'S CLOCK. *See* **Tragopogon pratensis.**

SHERBOURNIA (named in honour of Mrs. Sherbourn, who first flowered the plant in England). ORD. *Rubiaceæ*. A monotypic genus. The species is an unarmed, scandent, pubernlous or glabrescent, stove, evergreen shrub or tree, formerly included under **Gardenia** (which *see* for culture).

Sherbournia—*continued.*

S. foliosa (leafy). *fl.* 1in. to 2¾in. long, fleshy-coriaceous, rigid, axillary, solitary or twin; calyx limb ¼in. to 1in. long; corolla white outside and purple inside, or orange variegated with purple. June and July. *l.* opposite, elliptic to ovate-oblong, acuminate at apex, cuneate, rounded, or cordate at base, 2in. to 9in. long, ¾in. to 4¼in. broad; stipules caducous, ¼in. to ¾in. long. Western tropical Africa, 1842. SYNS. *Amaralia bignoniæflora, Gardenia calycina, G. Sherbourniæ* (B. M. 4044).

SHIELD FERN. *See* **Aspidium.**

SHIFTING. The act of potting is frequently termed Shifting by gardeners. The term is also applied to moving trees, shrubs, and plants from one part of the garden to another.

SHINGLE PLANT. *See* **Monstera acuminata.**

SHIRLEY POPPIES. A group of these well-known and useful plants, fully dealt with under **Papaver,** is shown at Fig. 675.

SHOOT. A young growing branch or twig, or a vigorous stem.

SHORTIA (named in honour of Dr. Charles W. Short, of Kentucky). ORD. *Diapensiaceæ.* A small genus (three species) of highly glabrous, scapigerous herbs, with a perennial caudex, natives of the mountains of Carolina and Japan, allied to **Galax** (which *see* for culture). Flowers white or pink, on a terminal scape, solitary, ample, nodding; calyx squamose-bracteate, five-parted; corolla campanulate, five-lobed; staminodes five, scale-like. Capsule erect. Leaves all radical, long-stalked, orbicular or cordate, toothed or serrated, persistent, scaly at base. A most interesting account of *S. galacifolia*, which thrives almost anywhere, but prefers peat and sand, is given in the "Botanical Magazine" (7082).

S. galacifolia (Galax-leaved).* *fl.* white, 1in. across; corolla lobes ovate-oblong, deeply crenate, the tube short, funnel-shaped; scapes red, slender, 3in. to 9in. long. Spring. *l.* obtuse, 2in. broad, repand-denticulate, shining, assuming a pretty, bronzy-crimson tint in autumn. North Carolina, 1881. Plant tufted. (B. M. 7082; G. C. 1831, i., p. 596, f. 109; G. & F. 1883, p. 506, f. 80.)

S. uniflora (one-flowered). *fl.* pale pink, with white veins, nearly 1in. across; stamens white. *l.* cordate, sinuate-toothed, retuse at apex. North Japan.

SHORTIA CALIFORNICA. This name has been applied in gardens to **Actinolepis coronaria** (which *see*). It has nothing to do with the genus *Shortia.*

SHOT-BORERS. *See* **Apple-Bark Beetle.**

SHREDS. These are usually small pieces of cloth employed to secure wall-trees and their growths in their proper positions. Waste cloth may be purchased at a cheap rate from tailors and drapers. This is cut into small, narrow strips of a length to suit requirements, and, after being passed round the shoot or branch, is nailed to the wall. If the time and labour can be spared, it is an excellent plan to take all wall-trees away from the wall and burn all the shreds, as they form harbours for insects and their eggs. By burning the Shreds thousands of pests would be destroyed.

SHY BUG (*Anthocoris nemorum*). An interesting insect belonging to the *Hemiptera — Heteroptera*, though rather to the farm than to the garden. It is sometimes found in large numbers in Hop-grounds. The point about it is that entomologists are not decided as to whether or not to condemn or to praise it. Undoubtedly it is, to a certain extent, injurious by reason of the fact that it sucks the bine; on the other hand, it destroys vast quantities of Aphides, and thus may be regarded as a blessing in disguise. The insects are only about 4mm. in length, with dark red head, thorax, and shield, and pale yellow wing-cases margined with red. There are two, and sometimes three broods, the first being abroad in the spring. The larvæ are wingless and lighter in colour than the perfect insects. The popular name has been bestowed on account of the habit the insects have of ensconcing themselves directly they are approached by man.

SIBTHORPIA. *S. europæa variegata* has the leaves slightly larger than in the typical native *S. europæa*, and of a bright golden-green colour.

SICANA (said to be the Peruvian name of one of the species). ORD. *Cucurbitaceæ.* A small genus (about three species) of tall, greenhouse, climbing herbs, allied to *Cucurbita.* Flowers yellow, rather large, solitary. Fruit large, fleshy, many-seeded. Leaves palmately three- to nine-lobed. For culture, *see* **Gourds.**

S. atropurpurea (dark purple). *fl.* lobed, reddish-violet beneath, large. *fr.* purplish-violet, shorter than in *S. odorifera*, strongly perfumed. Paraguay, 1892. (R. H. 1894, p. 103.)

S. odorifera (scented). *fl.* monœcious, axillary; ovary 2in. to 2½in. long. *fr.* yellow, finally orange, cylindrical, glabrous, something like a large Cucumber, with a peculiar odour; flesh pale yellow, edible. *l.* sub-orbicular, 5in. to 10in. in diameter, deeply cordate at base, five- to seven-lobed. *h.* 30ft. to 45ft. Brazil, 1889. (R. H. 1890, p. 516, f. 163.)

S. sphærica (spherical). *fl.*, males golden-yellow, pubescent outside, campanulate, 4in. across. September. *fr.* globose, about the size of a small Orange. *l.* 3in. to 4in. in diameter, reniform in outline, deeply three- to five-lobed, deeply cordate at base. Jamaica, 1884. Plant nearly glabrous. (B. M. 7109.)

SIDA. The following changes of nomenclature may be noted:

S. alcæoides (Alcæa-like). A synonym of *Callirhoe alcæoides.*

S. inæqualis and **S. sessiliflora** are classed by the Kew authorities under *Abutilon.*

S. integerrima (entire). A synonym of *Abutilon integerrimum.*

S. Napæa is accorded generic rank as *Napæa dioica.*

S. periptera (winged round). A synonym of *Anoda parviflora.*

SIDALCEA. To the species described on p. 431, Vol. III., the following variety should be added:

S. malvæflora Listeri (Lister's).* *fl.*, corolla pink, fringed, 1½in. in diameter, spreading. 1897. A pretty variety. There are also nice forms known as *atropurpurea* (bright purple) and JAMES DICKSON (dark rose).

S. oregana (Oregon). A synonym of *S. malvæflora.*

SIDERANTHUS. Included under **Haplopappus** (which *see*).

SIDEROXYLON SPINOSUM (of Linnæus). A synonym of **Argania Sideroxylon** (which *see*).

SIEBERA. The correct name of this genus is *Platysace.*

SIEBERA (of Presl). A synonym of **Anredera** (which *see*).

SIEGESBECKIA. *S. cordifolia, S. droseroides, S. iberica,* and *S. triangularis* are merely forms of *S. orientalis.*

SIEVEKINGIA (a commemorative name). ORD. *Orchideæ.* A small genus (four species) of stove Orchids, allied to *Lacæna*, natives of South America. Only one species is known in gardens. For culture, *see* **Acineta.**

S. Reichenbachiana (Reichenbach's). *fl.* about six in a pendulous corymb, each about 2in. across; sepals pale straw-coloured, concave; petals narrower, and, as well as the lip, fringed with deep yellow hairs, the lip blotched with red; peduncle 2in. long. *l.* solitary, elliptic-lanceolate, plicate, prominently ribbed; petioles red-speckled. Pseudo-bulbs 1in. long, clustered, blotched with red. Ecuador, 1890. (B. M. 7576.)

SILENE. According to Mr. F. N. Williams ("Journal of the Linnean Society," vol. xxxii.), this genus embraces 390 species. He removes *S. Elizabethæ, S. lacera, S. laciniata, S. noctiflora, S. ornata, S. pennsylvanica, S. regia* (*M. illinoense*), and *S. virginica* to *Melandryum*, which is again restored to generic rank. To the species described on pp. 432-3, Vol. III., the following should be added:

S. acaulis exscapa (stalkless). A variety having paler flowers than the type, and dense, bright green cushions.

S. a. grandiflora (large-flowered).* A large-flowered, crimson variety on stalks 2in. or more long.

S. ægyptiaca (Egyptian). The correct name of *S. Atocion.*

S. alpestris. The correct name is *S. rupestris.*

S. anglica. *S. gallica* is the typical form.

S. bipartita (twice-parted). A synonym of *S. vespertina.*

S. Fortunei (Fortune's). *fl.* pink or white, solitary or in a shortly-branched raceme; calyx 1¼in. long, tubular; petals bipartite, the lobes incised. *l.* linear-lanceolate, acute, attenuated to the petioles. Stems numerous, erect, shrubby below. China, 1898. (B. M. 7649.)

Silene—*continued.*

S. gallica is the typical form of *S. anglica.*

S. juncea (Rush-like). The correct name of *S. picta.*

S. maritima. Witches' Thimble. In addition to the double variety, there is a form with pink flowers.

S. pendula alba (white). A variety with white flowers.

S. p. compacta. Of this there are single and double forms with white, pale and dark rose, and red flowers, and one with yellow leaves.

S. p. ruberrima Bonnettii (Bonnett's very red). *fl.* of a bright carmine-rose. Stems, branches, and leaves strongly tinted with purple. Plant wholly glabrous.

S. picta. The correct name is *S. juncea.*

S. Pumilio (dwarf).* *fl.* pink, 1½in. across, solitary, on slender pedicels; calyx oblong-campanulate; petals undivided. June. *l.* linear, obtuse, ciliated. Stems tufted, simple. Tyrol, &c., 1823. A beautiful, very dwarf rock plant, of which there is also a white-flowered form.

S. rupestris (rock-loving). The correct name of *S. alpestris.*

S. Saponaria. A synonym of *Saponaria officinalis.*

S. Zawadzkyi (Zawadzky's). *fl.* white, in dichotomous racemes; limb of the petals orbicular, with two appendages. May and June. *l.*, radical ones rosulate, lanceolate, acute; cauline ones very narrow. Stems erect. *h.* 6in. to 8in. Galicia.

SILPHIUM. To the species described on p. 435, Vol. III., the following should be added:

S. albiflorum (white-flowered). *fl.-heads* sessile in the axils or stoutly pedunculate, 3½in. across; involucre sub-globose; ray florets pale straw-coloured or creamy-white, narrowly oblong, bifid. September. *l.* ovate, pinnatifid or bipinnatifid, coriaceous, the uppermost ones linear; lobes linear, 2in. to 5in. long. Stem simple, 2ft. to 4ft. high. Texas. Plant clothed with short prickles. (B. M. 6918.)

S. integrifolium (entire-leaved). *fl.-heads* somewhat corymbose, nearly all shortly pedunculate. Summer and autumn. July and August. *l.* entire or denticulate, ovate-lanceolate; upper ones closely sessile, partly amplexicaul, acute at apex, 3in. to 5in. long, glabrous to cinereous-pubescent. Stem smooth or scabrous, sometimes rough-hispidulous.

S. terebinthinaceum pinnatifidum (pinnatifid). *l.* deeply cut or pinnatifid.

SILVA. *See* **Sylva.**

SILVER-FIR LEAF DISEASE (*Acanthostigma parasiticum*). A very distinct fungoid disease, characterised by the perithecia being spherical, and covered with radiating hairs, as suggested by Hartig's generic name of *Trichosphæria.* The needles of affected trees wither and die, and may be found hanging from the partially-killed shoots by means of a white mycelium. Though chiefly confined to the Silver Fir, it occasionally attacks other Conifers, especially those growing amidst damp surroundings. Alike in Britain, on the Continent, and in America, the disease is prevalent. Though so far no remedy has been offered, yet, by removing and burning the affected portions, something may be done towards staying the progress of the disease.

SILVER-LEAF OF PEACH. *See* **Peach—Fungi.**

SIMARUBA [the correct spelling]. To the species described on p. 436, Vol. III., the following should be added:

S. Tulæ. *fl.* bright carmine, about ¼in. in diameter; branches of the corymb (as well as the petioles) purple-tinted. *l.*, leaflets elliptic-oblong, shortly pointed. Porto Rico, 1889. (R. G. 1889, 1298.)

SINNINGIA. *S. Carolinæ* is the correct name of *S. barbata.* An interesting bigeneric hybrid, called *Gloxinia Tapeionites*, was raised in 1892, in a Continental garden, between a spotted *Gloxinia* and *S. barbata* (*Tapeionites Carolinæ*).

SINUOUS. Flexuous; undulating.

SIPHOCAMPYLUS. The correct name of *S. coccineus* is *Centropogon coccineus. S. fulgens* is now regarded as specifically distinct from *S. Humboldtianus. S. leucostomus* is a form of *S. coccineus.*

SIPHONOPHORA LACTUCÆ. *See* **Lettuce—Injurious Insects,** Vol. II.

SIREX. Of this genus, *S. gigas* and *S. juvencus* are now fairly well-known insects, occurring in many parts of England, though frequently records are from districts and

Sirex—*continued.*

places that lead one to suppose that the insects have emerged from wood used in buildings, or more frequently perhaps as shoring material for pits; usually, too, it is the males only that are seen. Though formidable-looking, especially *S. gigas* (Fig. 676), owing to its size, the strong ovipositor, and boring apparatus, and the general colour and markings approximating to that of Wasps, the insects

FIG. 676. HORN-TAILED SAWFLY (*Sirex gigas*).

are unable to inflict any injury upon man. We mention this because it is not rare in new houses to find one of these insects flying and making a loud humming noise.

Whether or not they are to be considered pests is an open question. Those we have have heard of and seen have been in trees already decayed, and we do not remember to have found the insects in thoroughly healthy ones. A full description of these Wood Wasps, as they are sometimes called, will be found in Vol. III., p. 439.

SIRRASTYLIS. *See* **Serrastylis.**

SISYRINCHIUM. There are fifty-eight known species of this genus. Many plants formerly classed hereunder are now referred to **Bobartia, Calydorea, Eleutherine, Homeria, Libertia, Orthrosanthus, Solenomelus, Symphyostemon, Trimezia,** &c.

SKIMMIA. To the species, &c., described on pp. 440-1, Vol. III., the following should be added:

S. Fortunei (Fortune's). This is the correct name of the plant described in Vol. III. as *S. japonica* (Hort.), and B. M. 4719 (not Thunb.).

S. japonica (Japanese), of Thunberg. The correct name of *S. oblata.* The following names, which are somewhat confusingly employed in trade catalogues, are regarded either as seedling varieties or as sexual forms of this species: *S. Foremani, S. fragrans, S. fragrantissima, S. intermedia, S. oblata ovata, S. oblata Veitchii*, and *S. Rogersii.*

SKINNERA. Included under **Fuchsia** (which *see*).

SLEEP. A condition of plants, generally found at night, characterised by the flowers closing and drooping, and by the leaves folding.

SLEEPING DISEASE OF TOMATO (*Fusarium lycopersicæ*). The chief symptom of this disease is the entire collapse of the plants—a whole house may succumb that but a short time previously gave no outward sign that anything was amiss. The disease is not amenable to treatment. The whole of the plants should be burned, the soil treated with lime, and the house washed with a fungicide.

SLEVOGTIA. A synonym of **Enicostema** (which *see*).

FIG. 677. MATURE SLUGWORM LARVA.

SLUGWORMS. *Eriocampa limacina* larvæ (Fig. 677) are found in very large numbers upon Pear, Apple, Plum, Cherry, and other trees. In addition to the remedies suggested in Vol. III., freshly-slaked lime freely dusted

Slugworms—*continued.*

on the foliage in the early morning should be tried. Where the attack is a bad one, and Paris Green can be applied, it should be employed, as being chewing insects the Slugworms are readily poisoned by the arsenical preparations. As a general remedy the quicklime, however, will be better.

SMALL TORTOISESHELL. *See* **Vanessa.**

SMALLREED. *See* **Calamagrostis.**

SMELOWSKIA (named in honour of T. Smelowski, a Russian botanist who worked early in the nineteenth century). ORD. *Cruciferæ.* A small genus (four species) of somewhat tufted, woolly-tomentose, hardy perennial herbs, natives of Siberia. Flowers white or yellow, usually small, racemose, without bracts. Leaves pinnately or bipinnately cleft. *S. calycina* (SYN. *Hutchinsia calycina*) has been introduced, but is probably no longer grown in our gardens, being of little horticultural value.

SMERINTHUS. *See* **Sphingidæ.**

SMERINTHUS OCELLATUS. *See* **Sphingidæ.**

SMERINTHUS POPULI. *See* **Sphingidæ.**

SMERINTHUS TILIÆ. *See* **Sphingidæ.**

SMILACINA. *S. bifolia* and *S. canadensis* are synonyms of **Maianthemum Convallaria** (which *see*).

SMILAX. To the species described on pp. 444-5, Vol. III., the following should be added:

S. argyræa (silvery). *l.* very shortly petiolate, lanceolate, acuminate, 5in. to 6in. long, bright green, variegated with white spots. Stems very prickly. Bolivia, 1892. Stove climber. (I. H. 1892, t. 152; R. H. 1893, p. 201.)

S. mauritanica (Mauritania). A variety of *S. aspera.*

SNAIL FLOWER, CLIMBING. *See* **Phaseolus Caracalla.**

SNAKE'S-HEAD. *See also* **Hermodactylus.**

SNEEZEWORT. *See* **Achillea Ptarmica.**

SNOWBERRY, CREEPING. *See* **Chiogenes.**

SNOWDROP MILDEW (*Sclerotinia galanthina*). *See* **Galanthus.**

SNOWDROP WINDFLOWER. *See* **Anemone sylvestris.**

SOAP-PLANT. *See* **Chlorogalum.**

SOAP-TREE. *See* **Gymnocladus chinensis.**

SOBOLEWSKYA (a commemorative name, which has been misprinted *Tobolewskia* in some works). ORD. *Cruciferæ.* A small genus (two species) of hardy, erect, paniculately-branched, annual herbs, natives of Asia Minor. Flowers white, on slender pedicels; sepals spreading. Siliquas ascending, clavate, compressed or somewhat terete, one-celled, one- or rarely two-seeded. Leaves rounded, deeply crenate. For culture, *see* **Perennials** and **Annuals.**

S. clavata (club-shaped). *fl.* very numerous, corymbose. May. *fr.*, siliquas rostrate-clavate at apex. *l.*, lower ones long-petiolate, reniform-cordate; upper ones almost sessile. Armenia, 1892.

S. lithophila (stone-loving). *fl.* as in *S. clavata.* *l.*, lower ones long-petiolate, cordate-reniform, deeply and obtusely incised; upper ones sessile, oblong, toothed. Tauria, &c. A highly glabrous annual.

SOBRALIA. To the species described on pp. 448-9, Vol. III., the following should be added:

S. Beyeriana (Beyer's). *fl.* 5in. across; sepals and petals white, tinged with lilac; lip rosy-lilac, large, wavy, with a yellow throat. *l.* broad. *h.* 1½ft. Habitat not recorded, 1892.

S. Brandtiæ (Mme. Brandt's). *fl.* borne from a cone-like head; sepals and petals rosy-purple, linear-oblong; lip convolute, with a yellow disk and wavy margins. *l.*, sheaths marked with black spots. South America, 1896. Habit of *S. macrantha.*

S. chlorantha. The correct name is *S. macrophylla.*

S. Lindeni (Linden's).* *fl.* 10in. in diameter; sepals and petals white, tinted with rose; lip crimson-purple in front, white in the folded portion, with a few chocolate lines in the throat. Stems shorter than in *S. macrantha.* Ecuador, 1895.

S. Lowii (Low's). *fl.* deep purple, freely produced, but lasting only a short time; sepals and petals about 2in. long; lip rather shorter. *l.* narrow-lanceolate, with a tapering point.

Sobralia—*continued.*

Stems 1ft. to 1½ft. high. Colombia, 1890. A distinct species, allied to *S. sessilis.*

S. Lucasiana (C. T. Lucas's).* *fl.* large, similar in shape and size to those of *S. xantholeuca*; sepals and petals white, faintly tinged with rose; lip rosy-purple, with a yellow blotch at the base. Tropical America, 1892. Probably a variety of *S. macrantha.*

S. luteola (yellowish). *fl.* light yellow, 3in. across, with darker veins on the lip and a few traces of brown between the keels. *l.* oblong-lanceolate, plicate, 6in. long. Stems 3ft. high. Tropical America, 1898. Allied to *S. suaveolens.*

S. macrantha alba nana (dwarf white). *fl.* pure white. Stems only 1ft. high. 1897.

S. m. delicata (delicate). *fl.* almost wholly white; sepals and petals slightly tinged with lavender; lip edged with soft lilac. 1891.

S. m. Hodgkinsoni (Hodgkinson's).* *fl.* large; sepals and petals rosy-lilac; lip brilliant rosy-purple and orange. 1894. A beautiful variety.

S. m. Kienastiana (Kienast's).* *fl.* pure white, with the exception of a small blotch of yellow at the base of the lip. 1888.

S. m. rosea (rosy). *fl.*, sepals light rose; petals and lip deep rose. 1890.

S. macrophylla (large-leaved). The correct name of *S. chlorantha.*

S. Sanderæ (Mrs. Sander's). This species is allied to *S. leucoxantha*, but the flowers are larger, sulphur-white in colour, and lack the orange markings in the throat. Central America, 1890.

S. sessilis (of B. M. 4570). A synonym of *S. decora.* The true *S. sessilis*, which is described in Vol. III., is figured in B. M. 7376.

S. Warscewiczii (Warscewicz's). *fl.* very bright purple, larger than in *S. Liliastrum*; petals cuneate, acute; lip flabellate, emarginate at apex. *l.* broadly oblong, firm. Stems firm and compact. Costa Rica (at 6000ft.), 1890.

S. Wilsoni (Wilson's). *fl.* white, faintly suffused with rose, blotched with yellow on the lip; sepals acuminate, 4½in. long; lip emarginate, crispo-undulated, 3½in. long. *l.* lanceolate, very acuminate, 7in. long. Central America, 1890.

S. xantholeuca albescens (white). *fl.* pale primrose, with the throat golden-yellow. 1889.

Hybrids.

NAME.	PARENTAGE AND RAISER.
Amesiana	*xantholeuca* and *Wilsoni* (Sander).
Veitchiana	*macrantha* and *xantholeuca* (Veitch).

SOGALGINA. Included under **Tridax** (which *see*).

SOILING-UP. The earthing-up of Celery to blanch it, and the drawing-up of soil to the stems of Potatoes, Cabbage, Cauliflower, &c., is also known as Soiling-up.

SOLANDRA. *S. lævis* is now regarded as a form of *S. longiflora.*

SOLANUM. To the species and varieties described on pp. 452-6, Vol. III., the following should be added:

S. albidum Poortmanni (Poortmann's whitish).* *fl.* white, small, produced in numerous cymes, towards the end of the season, on the young, white-tomentose shoots. *l.* large, pinnatifid, 2ft. long, bright green above, white-tomentose beneath. Andes, 1886. A noble, half-hardy perennial. (R. H. 1886, p. 232, f. 67.)

S. anthropophagorum. The correct name is *S. Uporo.*

S. auriculatum (auricled). *fl.* violet, with a central white stripe, ⅔in. in diameter. *fr.* reddish, globular, as large as a Sloe. *l.* ample, soft, ovate-oblong, long-acute, green and glabrous above, greyish and tomentose beneath, often accompanied by two rounded, stipule-like organs. Madagascar, &c. Half-hardy annual.

S. boerhaviæfolium (Boerhavia-leaved). A synonym of *S. jasminoides.*

S. cernuum (drooping). *fl.* white, with golden anthers, subsessile, 1in. across; cymes drooping, almost opposite the leaves. *l.* sometimes 2ft. long, broadly oblong or ovate, acuminate, rounded or narrowed at base, undulate-margined, bright shining green above, white and hairy beneath. Stem or trunk 6ft. to 8ft. high, naked below, hairy above. South Brazil. A small, stove tree. (B. M. 7491.)

S. chrysotrichum (golden-haired). *fl.* purple, campanulate, 1¼in. across. *l.* ovate, acute, with seven or more lobes, spiny, 4in. to 5in. long. Nyassa-land, 1894. Stove.

S. ciliatum macrocarpum (large-fruited). A variety having fruit 1¼in. in diameter. 1828. (R. H. 1888, p. 78, f. 16.)

S. citrullifolium (Citrullus-leaved). A synonym of *S. heterodoxum.*

Solanum—*continued.*

S. cornutum (horned). *fl.* yellow, 1in. to 1¼in. across, plicate, resembling a five-rayed star, one segment produced; cymes simple, few-flowered. *l.* pinnatipartite, 5in. to 7in. long, 3in. to 4in. broad; partitions pinnatifid, prickly; prickles straight, subulate, yellow. Stem herbaceous, prickly, 4ft. high, branched. Mexico, &c. Greenhouse. (G. C. 1897, ii., p. 311, f. 94.)

S. coronatum (crowned). *fr.* variegated, as large as a Plum. *l.* dark green, pinnatifid. *h.* 3ft. Habitat not recorded, 1892. A greenhouse or half-hardy, much-branched, leafy species, armed with violet and grey prickles.

S. Dammannianum (Dammann's). *fl.* dark blue, large, disposed in clusters. *fr.* yellow. *l.* large, cordate-ovate, with wavy, sinuate borders, tomentose on both sides. Stems covered with stellately-branched hairs. *h.* 8ft. to 9ft. Habitat not recorded, 1890. A robust, greenhouse species.

S. demissum (weak). A form of *S. tuberosum.*

S. Duchartrei (Duchartre's). *fl.* purple, hairy on the outside. *l.* sinuately lobed. Western tropical Africa, 1890. Stove shrub, prickly in all its parts.

S. duplosinuatum (doubly sinuate).* *fl.* blue, large. *fr.* white. *l.* large, pinnatifid, of a clear green, suffused with bronze-colour, and armed with yellow prickles. Abyssinia, 1892. A fine, tall-growing, strong plant.

S. Farini (Farini's). A strong-growing, blue-flowered, spiny, greenhouse species, something in the way of *S. duplosinuatum.* Africa, 1896.

S. ferrugineum (rusty). A synonym of *S. torvum.*

S. guineënse (Guinea). *fl.* violet, small, sub-umbellate. *fr.* dark blackish-blue, shining, numerous. *l.* ovate, glabrous, entire, paler beneath, cuspidate, the larger ones 6in. long, including the petioles. *h.* 2ft. to 4ft. West Africa, 1889. A half-hardy annual, of rapid growth, referred, in the "Index Kewensis," to *S. nigrum.*

S. havanense (Havana). The correct name of *S. Hookerianum.*

S. heterodoxum (heterodox). *fl.* violet, 1½in. across, with orange anthers; corolla lobes acute; cymes few-flowered, near the tips of the branches. July. *l.* deeply pinnatifid; lobes five to seven, obtuse, pinnatifid-toothed. Stem branched, spiny. *h.* 1½ft. to 2ft. Texas, 1820. Hardy, pubescent annual. SYN. *S. citrullifolium.*

S. Hookerianum. The correct name is *S. havanense.*

S. hybridum Hendersonii (Henderson's). *fl.* white, abundantly produced. *fr.* orange-red, ovoid. Habitat not recorded, 1878. This much resembles *S. Pseudocapsicum.*

S. jasminoides floribundum (abundant-flowered).* A more floriferous plant than the type, and having smaller and less pinnatifid leaves. 1886. It is a fine climber.

S. lasiophyllum (woolly-leaved). *fl.* purple, few, in short, dense racemes; corolla 1in. to 1½in. across, shortly and broadly lobed. *fr.* ovoid-globular, enclosed within the calyx. *l.* very shortly petiolate, ovate-oblong to nearly orbicular, very thick and soft, 1in. to 2in. long. *h.* 2ft. to 3ft. West Australia, 1897. A stout, rigid, prickly, greenhouse shrub or under-shrub, densely and softly stellate-tomentose.

S. Melongena. The form *ovigerum* has white fruits the size of a hen's egg; and in *speciosa atropurpurea* they are of a beautiful reddish-scarlet.

S. Monteiroi (Monteiro's). *fl.* purple, campanulate, 1½in. in diameter. *fr.* purple, large, edible. *l.* oblong, thin, 8in. long. Angola, 1894. Stove shrub.

S. Mors-elephantum (elephant's-death). *fl.* bright blue. *fr.* canary-yellow, large, depressed-globose. *l.* dark green, lyrate, borne on violet-coloured petioles. *h.* 3ft. Tropical Africa, 1894. Greenhouse bush.

S. muticum (curtailed).* *fl.* violet-blue; peduncles axillary, fascicled. *fr.* reddish, about as large as Hazel-nuts. *l.* alternate, petiolate, lanceolate, acuminate, softly pubescent. *h.* 4½ft. Paraguay, 1894. This greenhouse bush had been previously grown in this country but had been lost for some twenty years previous to the date given above. (B. M. 1894, t. 1401.)

S. Ohrondii (Ohrond's). A synonym of *S. Commersoni.*

S. ovigerum (egg-bearing). A form of *S. Melongena.*

S. pensile (pendulous). *fl.* bright violet-blue, with a white, star-shaped eye and conspicuous yellow stamens; corolla 1½in. across, the segments with incurved tips; panicles large, pendulous, pubescent. May. *l.* 2in. to 4in. long, ovate or cordate-ovate, paler beneath. Demerara, 1887. A tall, branched, stove-climber. (B. M. 7062.)

S. Pierreanum (Pierre's). *fr.* rounded, ribbed, 1½in. in diameter; when young green striped with deep violet, then ivory-white changing to golden-yellow, and when quite ripe of an intense vermilion-scarlet. *l.* ovate, acuminate, obscurely lobed, deep green. Western tropical Africa, 1899.

S. Pseudocapsicum nanum (dwarf). A dwarf, much-branched, tufted variety.

S. racemigerum and **S. rosarigerum** (of Continental gardens). Synonyms of *Lycopersicum esculentum.*

Solanum—*continued.*

S. texanum ovigerum (egg-bearing). *fr.* bright red when ripe, the shape and size of hens' eggs. Stem erect, bushy. 1894. A half-shrubby perennial.

S. Tomatillo (small Tomato).* *fl.* purple, Potato-like but smaller, terminal, corymbose; calyx five-toothed; corolla puberulous outside; peduncles branched. *l.* solitary, linear, obtuse, entire, glabrous, rather thick, the margins undulate-crisped. Stem shrubby, with almost herbaceous, highly glabrous branches. Chili. A desirable plant, quite hardy, though it may be usefully employed as a greenhouse subject, flowering the greater part of the winter. It may be readily increased from cuttings.

S. torvum (wild, gloomy). *fl.* white, 1½in. across, many in lateral, dense, often dichotomous racemes. *fr.* yellow, ¼in. to ½in. in diameter. *l.* ovate, 6in. long, sinuate or lobed, softly hairy above, stellately tomentose beneath, without prickles. *h.* 8ft. to 12ft. Tropics, &c. (cosmopolitan). Greenhouse shrub. SYN. *S. ferrugineum.*

S. tuberosum. There is a variegated form—*variegatum.* 1897.

S. Uporo is the correct name of *S. anthropophagorum.*

S. verrucosum (warted). A form of *S. tuberosum.*

SOLDANELLA. To the information given on pp. 456-7, Vol. III., the following should be added:

S. affinis (related). A synonym of *S. montana.*

S. hybrida (hybrid). A natural hybrid between *S. alpina* and *S. pusilla.*

S. minima alba (white). A variety with white flowers.

S. pusilla is the correct name of *S. Clusii.*

SOLENACHNE. A synonym of **Spartina** (which *see*).

SOLIDAGO. Including *Euthamia.* To the species described on pp. 457-8, Vol. III., the following should be added:

S. californica (Californian). *fl.-heads* golden-yellow, ¼in. long, disposed in a dense, twiggy thyrse 4in. to 12in. long; rays seven to twelve. *l.* oblong, oblong-lanceolate, or obovate, obtuse or apiculate, entire or slightly toothed. Stem rather stout, low or tall. Plant pubescent or puberulent.

S. Gattingeri (Gattinger's). *fl.-heads* small, in racemiform clusters, forming a corymbiform, naked panicle. *l.* ciliolated; lowest cauline and radical ones lanceolate-spathulate, appressed-serrulate; upper ones mainly entire, oblong-lanceolate, about 1in. long; uppermost ones ¼in. to ½in. long. Branches and inflorescence glabrous. *h.* barely 2ft.

S. glabra (glabrous). A synonym of *S. serotina.*

S. grandiflora (large-flowered). A form of *S. littoralis.*

S. littoralis (shore-loving). *fl.*-heads rather large, but resembling those of *S. Virgaurea*; raceme oblong, crowded. Summer. *l.* obovate-lanceolate, almost entire. Stems simple. Italy, &c. Whole plant shortly velvety-pubescent. "*S. grandiflora*, of unknown source, is evidently a tall, cultivated form of this" (Asa Gray).

S. multiflora (many-flowered). A synonym of *S. ulmifolia.*

S. nutans (nodding). A synonym of *S. canadensis.*

S. Shortii (Short's). *fl.-heads* narrow, in racemiform clusters; panicle oblong or pyramidal. *l.* bright green, oblong-lanceolate, the longer ones 2in. to 3in. long, acute, slightly serrated. Stem and flowering branches scabrous. *h.* 2ft. to 4ft. Allied to *S. Gattingeri.*

S. ulmifolia (Elm-leaved). *fl.-heads* resembling those of *S. rugosa.* Summer. *l.* bright green, glabrous or pubescent, acute or acuminate at both ends, coarsely serrated. Stem smooth. Allied to *S. rugosa.* SYN. *S. multiflora.*

S. Virgaurea nana (dwarf).* *fl.-heads* golden-yellow. *h.* 2ft. A compact form, suitable for the mixed border.

S. V. prostrata (prostrate). A pretty, dwarf variety.

SONCHUS. To the species described on p. 458, Vol. III., the following should be added. One or two plants formerly included hereunder are now referred to **Lactuca.**

S. arboreus (tree-like). *fl.-heads* larger than in *S. pinnatus*, many in terminal corymbs; florets fifteen to twenty. *l.* pinnatipartite, spirally disposed; lobes linear, one to two lines broad, entire. Stem arboreous, terete, unarmed. Canary Islands.

S. congestus (crowded). The correct name of *S. Jacquini.*

S. leptocephalus (smooth-headed). *fl.-heads* many in terminal, corymbose panicles. June and July. *l.* pinnatipartite; lobes linear-filiform, entire, scarcely half-a-line broad. Stems shrubby, unarmed. Canary Islands.

SONERILA. To the species described on p. 458, Vol. III., the following should be added:

S. orientalis (Eastern). *fl.* bright rose or purple with yellow anthers, produced in profusion. *l.* broadly ovate, acute,

Sonerila—*continued.*

cordate at base, crimson-maroon, with or without a feathered, whitish, central band, or dotted with white on a light or dark green ground. Arakan Hills, Birma, 1890. There are three forms of this: *guttulata* (slightly striped), *picta* (painted), and *punctata* (dotted).

Hybrids. Some of the best-known are ALFRED MAME, DUCHESS DE BRABANT, FRANÇOIS MARCHAND, H. WALTER, LADY BURTON, MADAME ALESCH, MADAME VAN LANGENHOE, MADAME WALLERS, MRS. H. WALTER, SILVER QUEEN, and SOUVENIR DE MADAME VAN HOUTTE.

SOPHORA. To the species and varieties described on pp. 459-60, Vol. III., the following should be added:

S. japonica hybrida (hybrid). This differs from the typical "weeping" Sophora in the strong, horizontally-spreading main branches, and in the long, thin, pendulous smaller ones. 1893.

S. platycarpa (flat-fruited). This is scarcely distinguishable from *S. japonica* in habit and general aspect, but differs markedly in having flatter pods. Japan, 1896.

SOPHRO-CATTLEYA. These are bigeneric hybrids derived from the intercrossing of the genera *Sophronitis* and *Cattleya*.

NAME.	PARENTAGE AND RAISER.
Batemaniana	*S. grandiflora* and *C. intermedia* (Veitch).
Calypso	*S. grandiflora* and *C. Loddigesii* (Veitch).
Chamberlainiana triumphans	*S. grandiflora* and *C. Harrisonæ* (Chamberlain).
Cleopatra	*S. grandiflora* and *C. guttata Leopoldii* (Charlesworth).
eximia	*S. grandiflora* and *C. Boweringiana* (Veitch).
George Hardy	*S. grandiflora* and *C. Aclandiæ* (Hardy).
Queen Empress	*S. grandiflora* and *C. Mossiæ* (Veitch).

FIG. 678. SOPHRO-LÆLIA LÆTA.

SOPHRO-LÆLIA. Bigeneric hybrids derived from the intercrossing of the species of *Sophronitis* and *Lælia*.

NAME.	PARENTAGE AND RAISER.
læta. See Fig. 678	*S. grandiflora* and *L. Dayana* (Veitch).
Marriottiana	*S. grandiflora* and *L. flava* (Sir W. Marriott).

SOPHRO-LÆLIO-CATTLEYA. Bigeneric hybrids derived by intercrossing the species of *Sophronitis* with the bigeneric hybrid Lælio-Cattleya. The cultural requirements are the same as those recommended for the miniature-growing Cattleyas and Lælias.

NAME.	PARENTAGE AND RAISER.
Veitchii	*S. grandiflora* and *L.-C. elegans* (Veitch).
Veitchii (var. *Eros*)	*S. grandiflora* and *L.-C. elegans Turnerii* (Charlesworth).

SOPHRONIA. A synonym of **Sophronitis** (which *see*).

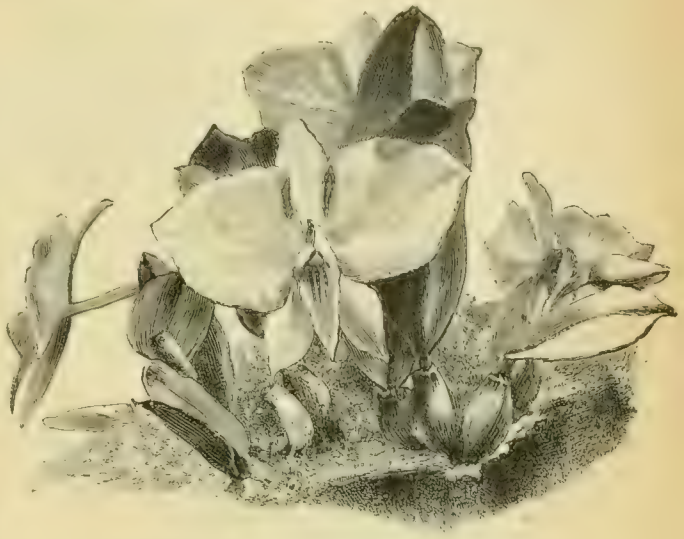


FIG. 679. SOPHRONITIS GRANDIFLORA.

SOPHRONITIS. SYN. *Sophronia.* To the species and varieties described on p. 460, Vol. III., the following should be added:

S. grandiflora aurantiaca (orange). A variety with dark orange-red flowers. 1886. (R. H. 1886, p. 492.) The type is shown at Fig. 679.

S. g. Rossiteriana (Rossiter's). *fl.* yellow, large and full. 1899

S. militaris is, according to the "Index Kewensis," a form of *S. grandiflora.*

S. pterocarpa is now regarded as synonymous with *S. cernua.*

SORI. The plural of **Sorus** (which *see*).

SOUR. Land that is wet or badly-drained is Sour, and unfitted to grow cultivated plants or trees upon. Borders planted with Vines or other fruit trees under glass quickly become sour if the drainage is not good; and the same applies to any plants in pots. Soil for potting, or for making fruit-borders, should always be got from sound land, and not from wet ground; from the latter it would be Sour and poor in quality and plant-food.

SOUTH AFRICAN YELLOW-WOOD. *See* **Podocarpus elongata.**

SOUTHWELLIA. Included under **Sterculia** (which *see*).

SOWING. The Sowing of seeds requires careful judgment and knowledge, not only as to the where and how, but also as to the proper season. For instance, many seeds will germinate at once if sown immediately after they are ripe, but if kept for some time, they will remain dormant for many months. Many of the Primulas are cases in point. Other seeds, such as Melons, Marrows, *Brassica*, &c., will germinate freely after keeping for some years. In Sowing seeds in the open ground, the soil ought to be fine and friable, dry, and parting freely from the rake or feet. When the soil is damp, and adheres to the tools and feet, it is almost impossible to sow the seeds properly; and if a little dry or hot weather follows, the ground bakes and hardens, and germination is almost impossible.

The quantity of seed to sow of any kind must be determined upon by the knowledge of the sower, as, for instance, Peas and Beans should be sown very thinly, while Radishes and all *Brassica* may be sown much more thickly; but with all outdoor Sowings, care should be exercised that the seeds are not sown too deeply. Fine seeds, like those of most Hardy Annuals, ought to be merely covered with the finest film of fine soil, otherwise many will fail to get through the soil; larger seeds, such as those of the Turnip in vegetables, and Sweet Williams (*Dianthus*

Sowing—*continued.*

barbatus) may be covered with ¼in. of fine soil. Peas and Beans will germinate freely if sown at a depth of 3in. or 4in.

Seeds sown under glass are more under the command of the gardener, and if good, germination is practically assured, provided he has proper convenience for Sowing, as, for instance, bottom-heat for raising Cucumbers and Melons early in the year. These are best sown singly in small pots of good soil, and the pots plunged up to their rims in Cocoa-nut fibre or tan, with a genial bottom-heat. This applies to most seeds sown very early under glass. Very small seeds, like those of the Begonia, should be sown on the surface of fine soil, and covered with a square of glass to prevent evaporation, and shaded until germination has taken place. Instead of watering these fine seeds with a "rose," it is best to dip the pot or pan nearly to the rim in warm water for a few minutes; the seed is thus undisturbed.

SOY. *See* **Glycine.**

SPADOSTYLES SIEBERI. A synonym of **Pultenæa euchila** (which *see*).

SPAËNDONCEA. A synonym of **Cadia** (which *see*).

SPANISH GARLIC. Another name for **Rocambole** (which *see*).

SPANISH IRIS. *See* **Iris Xiphium.**

SPANISH MOSS. *See* **Tillandsia usneoides.**

SPANISH ONION. Many of our best Onions have some of the old Spanish Onion blood in them, and those imported from Spain and Portugal are much the same as those grown in Britain; but they are sown very early, and transplanted when large enough to handle to rich soil, and liberally manured and watered afterwards, the fine, bright summers ripening-up the bulbs splendidly.

SPANISH VIPER'S GRASS. *See* **Scorzonera.**

SPARAXIS. J. G. Baker reduces the number of species to three, viz., *S. bulbifera*, *S. grandiflora*, and *S. tricolor*.

Varieties. Useful and well-tried varieties are Angelique, Delicata, Garibaldi, Josephine, Lady Carey, Leopard, Queen Victoria, and Victor Emmanuel.

SPARTIUM. This genus now embraces about half-a-dozen species, but only *S. junceum*, which is one of the finest of plants for sandy soils, appears to have been introduced. One or two plants formerly included hereunder are now referred to **Cytisus** and **Genista.**

SPARTOTHAMNUS (of Webb). Included under **Cytisus** (which *see*).

SPATALLA. According to the "Index Kewensis," the correct names of *S. incurva*, *S. pedunculata*, and *S. pyramidalis* are respectively *S. procera*, *S. curvifolia*, and *S. parilis*.

SPATHA. *See* **Spathe.**

SPATHANTHEUM. *S. Orbignyanum* is the correct name of *S. heterandrum*, and the genus is monotypic.

SPATHIPHYLLUM. *S. Wallisii* (of gardens) is a synonym of *Stenospermation Wallisii*.

SPATHODEA. Other species formerly included hereunder are now referred to **Dolichandrone** and **Macfadyena.** *S. pentandra* is synonymous with *Oroxylum indicum*.

SPATHOGLOTTIS. To the species described on p. 467, Vol. III., the following should be added:

S. Augustorum (named in honour of Auguste Linden and Auguste de Rhonne, two travellers and collectors). A synonym of *S. Vieillardii*.

S. gracilis (slender). *fl.* bright yellow, 2in. in diameter, with a few streaks of red on the inside of the lip. Borneo. This plant is often grown in gardens for *S. aurea*, which it resembles in every character except in having a broader-lobed and differently-formed lip. (B. M. 7366.)

S. ixioides (Ixia-like). *fl.* bright golden-yellow, ¾in. to 1¼in. across, nodding; lip having some reddish specks on the disk; scapes slender, erect, one- or two-flowered. Summer. *l.* two or three from each pseudo-bulb, 8in. to 18in. long, Grass-like; sheath purplish, pubescent. Eastern Himalaya, 1881. (B. M. 7060.)

Spathoglottis—*continued.*

S. Kimballiana (W. S. Kimball's).* *fl.* about 3in. across, the inner surface golden-yellow, the dorsal surface of the sepals and petals copiously spotted with reddish-brown, and with some faint red striolation on the lip, the lateral lobes of which are large. *l.* 2ft. long, 1in. to 1½in. broad, long-acuminate. Borneo. (B. M. 7443.)

S. plicata. There is a white-flowered form, *alba*.

S. Regnieri (Regnier's). This is closely allied to *S. Lobbii*. It differs as follows: *fl.* smaller, having no stripes on the lateral sepals; stalked ovaries shorter; side partitions of the lip shorter and broader; callus standing more backwards; peduncle having shorter hairs. *l.* much broader. Cochin China, 1887.

S. Vieillardii (Vieillard's).* *fl.* pale lilac, disposed in a nearly capitate raceme; lip tripartite, the side lobes rectangular, retuse, the mid-lobe long-clawed, oblong, two-lobed at apex. *l.* broadly cuneate-oblong, acute. Pseudo-bulbs ovoid, tinted brown. Sunda Isles, 1886. A fine species. (B. M. 7013.) SYN. *S. Augustorum* (L., t. 25).

FIG. 630. SPATHOGLOTTIS AUREO-VIEILLARDII (WIGAN'S VAR.).

S. V. rubra (red). *fl.* darker-coloured and larger than in the type, being of a bright purple; lip of a deeper tint than the sepals and petals. 1892. (J. H. 1892, XXV., p. 529, f. 70.)

Hybrids.

NAME.	PARENTAGE AND RAISER.
aureo-Vieillardii	*aurea* and *Vieillardii* (Veitch).
aureo-Vieillardii (Wigan's var.)	*aurea* and *Vieillardii* (Wigan). See Fig. 630.

SPATULATE. *See* **Spathulate.**

SPECIFIC. Having reference to a species. A Specific Name is that part of a scientific name which indicates the species; it follows the generic name.

SPECULARIA. Of *S. Speculum* there are several varieties, including large (*grandiflora*) and double-flowered kinds.

SPENNERA. A synonym of **Aciotis** (which *see*).

SPERGULA PILIFERA is synonymous with **Sagina subulata** (which *see*).

SPERGULASTRUM. Included under **Stellaria** (which *see*).

SPERMACOCE STRIGOSA. A synonym of **Crusea rubra** (which *see*).

SPHÆRALCEA. To the species described on p. 469, Vol. III., the following should be added:

S. Emoryi (Emory's). *fl.* orange-red, small, several together borne on slender pedicels from the axils of the leaves. *l.* petiolate, broadly ovate, pinnatifidly lobed and toothed. *h.* 1ft to 2ft. California, 1883. Hardy perennial. (R. G., t. 1266, f. 1.)

S. Munroana is the correct name of *Malvastrum Munroanum* (SYN. *Malva Munroana*).

SPHÆRELLA FRAGARIÆ. *See* **Strawberry Leaf Blight.**

SPHÆROLOBIUM. To the species described on p. 469, Vol. III., the following should be added:

S. grandiflorum (large-flowered).* *fl.* bright yellow and red, usually in pairs in the axils of scale-like bracts; standard ½in. long; racemes graceful, rather dense, terminal. Summer. Stems 1ft. to 3ft. high, terete, Rush-like, rather thick, leafless, or clothed with small, linear leaves. 1893. (B. M. 7303.)

SPHÆROPSIS. *See* **Sphæropsidæ.**

SPHÆROPTERIS BARBATA. This requires stove temperature, a shady situation, and an abundance of water at the roots all the year round. It is propagated by spores, which are freely produced when the plant has attained its full development.

SPHÆROSPORA. A synonym of **Acidanthera** (which *see*).

SPHÆROTHECA CASTAGNEI. *See* **Strawberry—Fungi.**

SPHÆROTHECA HUMULI. *See* **Strawberry—Fungi.**

SPHÆROTHECA MORS-UVÆ. *See* **Gooseberry Fungi.**

SPHÆROTHECA PANNOSA. *See* **Rosa—Fungi,** Vol. III.

SPHINGIDÆ. Though taken as a family the strikingly beautiful Hawk-Moths give very little trouble to the gardener, yet now and again there are to be found on Vines and upon fruit trees, as well as upon a few flowering plants, one or two species of the seventeen with which this country is credited. It will, therefore, be as well to direct attention to them, for even if present in small numbers the larvæ are such enormous feeders that they would quickly do an amount of injury to any plant on which they elected to dwell. Fortunately the caterpillars are large and are not likely long to escape the eye of the vigilant gardener, and particularly as their depredations are so much in evidence.

Of those at all likely to cause trouble to fruit-growers, the Large Elephant Hawk-Moth (*Chærocampa elpenor*) is the commonest; indeed, it shares with its relative, *C. porcellus*, the credit of being amongst the smallest as well as amongst the commonest of the family to which they belong. Both feed occasionally upon the Vine, as well as upon Codlins and Cream (*Epilobium hirsutum*), Fuchsias, &c. Then there is the Eyed Hawk-Moth (*Smerinthus ocellatus*), another fairly common species in this country, and a distinct one to boot. Not one of these elegant Moths is likely to be seen on the wing by day, but they may sometimes be found resting in the vicinity of their food-plants, and awaiting the cover of evening before venturing forth to pair.

FIG. 681. LARGE ELEPHANT HAWK-MOTH.

C. elpenor (Fig. 681) is on the wing towards the end of May or the beginning of June, in which latter month the eggs are deposited. These are hatched in July, and the larvæ at once commence to feed. It must not be assumed that the Vine is the only food-plant of this species, or indeed the commonest, but it is selected, as is also the Apple-Tree. By the time the caterpillars are full-fed they approach 3in. in length. As is sometimes the case with *Sphingidæ* the larvæ are of two kinds, brown and green, with a velvety surface, but quite destitute of hairs or points. The reticulations or other

Sphingidæ—*continued.*

markings vary with individuals, some being black, with yellowish sides, and others brownish. As will be seen by the illustration (Fig. 682), the head is small, and there is a small black horn situate on the twelfth segment. The creature, moreover, has two large and distinct eye-spots, and when, as is its wont if danger threatens, the anterior portion of the body is contracted into the posterior these spots look like eyes, and give a somewhat forbidding look to the insect.

FIG. 682. LARVA AND PUPA OF LARGE ELEPHANT HAWK-MOTH.

When full-fed the pupa state (Fig. 682) is assumed on the surface of the ground, the caterpillar having previously constructed a rough kind of cocoon from any pieces of material, such as leaves, to be found in the vicinity of its food-plant. In that it passes the winter, and emerges, as already stated, in May of the next year. The Moths are elegant of form and beautiful of marking. The fore-wings are bronze-green, margined with pink, and are traversed by pink lines; the thorax and the body are also green, and further adorned by crimson stripes. The under-surface is a lovely pink.

C. porcellus (Small Elephant Hawk-Moth) has such a close resemblance to its relative just described, that despite the colour variation it should readily be recognised The perfect insect, larva, and pupa, are shown at Figs. 683 and 684.

Smerinthus ocellatus (Eyed Hawk-Moth, Fig. 685) now and then occasions trouble to the Apple and Pear grower by the presence of the larvæ in considerable

Sphingidæ—*continued.*

FIG. 683. SMALL ELEPHANT HAWK-MOTH.

numbers. It is a fairly common species, but a most undesirable visitor to gardens, as the larvæ have not only voracious appetites, but they are feeding for several weeks and will quickly defoliate the trees. The Moths are on the wing at about the same time as those just described, and the larvæ (Fig. 686) hatch

FIG. 684. LARVA AND PUPA OF SMALL ELEPHANT HAWK-MOTH.

out from the eggs laid in June. They are greenish when full-fed, and have curiously disposed white stripes near the back and on the sides. The horn is blue, with a black tip, the head is a darkish green, and the legs are pinkish. The pupa state (Fig. 686) is passed beneath the surface of the soil.

Sphingidæ—*continued.*

FIG. 685. EYED HAWK-MOTH.

The Moths are pinkish-grey on the fore-wings and yellowish-grey on the hind-wings; while the two characteristic blue spots encircled with black (Fig. 685), from which the Moth derives its common name, are at once sufficient to distinguish it from all others. The thorax is grey and the body brown.

With caterpillars so conspicuous as those of the Hawk-Moths just named, hand-picking is by far the best remedy;

FIG 686. CATERPILLAR AND CHRYSALIS OF EYED HAWK-MOTH.

Sphingidæ—*continued.*

while the Moths themselves may be occasionally taken at rest in the daytime, or, in the case of Smerinthus, while on the wing, as it is slow in flight as compared with the Elephant Hawk-Moth.

FIG. 687. POPLAR HAWK-MOTH.

As stated in Vol. III., the Poplar Hawk-Moth (*Smerinthus Populi*) lives on Poplar, Laurustinus, and Laurel, as well as upon Willow and Aspen. It is the commonest of British Hawk-Moths, the most sombre as to colouring,

Sphingidæ—*continued.*

"light." The eggs, which number considerably over 100, are deposited in May or June, and take about ten days to hatch. The perfect insect is on the wing from May till July, and the pupa may be found from September till June. The larva when full-fed assumes the pupal state just below the soil, but without making any cocoon. Although the colour given in Vol. III. applies to some specimens, yet it is by no means constant, these insects showing considerable variation alike as regards colour and size. This Hawk-Moth, it is worthy of note, will pair not only with *S. ocellatus* but also with *Sphinx ligustri*, and hybrids of both are not uncommon.

S. tiliæ (Lime Hawk-Moth) is a handsome insect, and although its popular name points to the Lime as the food-plant, yet the larva will feed upon Hazel, Oak, Ash, Birch, Elm, Alder, and Sycamore. The eggs are laid towards the end of June. The perfect insect is on the wing from May till as late as August in exceptional cases, and the pupal state extends from October till June. See Figs. 689 and 690.

FIG. 688. LARVA AND PUPA OF POPLAR HAWK-MOTH.

and one of the weakest upon the wing. The perfect insect is shown at Fig. 687, and the larva and pupa are shown at Fig. 688. This Moth may often be taken at

Sphinx ligustri (Privet Hawk-Moth) is a fairly common species, and also a handsome one to boot. Though Privet is *the* food-plant, yet the larva will lay under

Sphingidæ—*continued.*

FIG. 689. LIME HAWK-MOTH.

contribution quite a large number of common garden plants—Lilac, Guelder Rose, Holly, Spindle Tree, Ash, Laurustinus, Snowberry, Fuchsia, Phillyrea, and others. From this it will be seen that its tastes are somewhat cosmopolitan. Though the presence of the larva should not remain long undetected, yet the insect itself is by no means easy to discover when feeding, so well does its colour harmonise with its environment. And even when full-fed and on the look-out for a favourable spot in which to assume the pupal state, its colour of bright pale green with white and violet and purple-edged stripes has been replaced by others that are not so likely to be noticed by insectivorous birds, or even by man. The pupal state is undergone beneath the ground. The eggs are laid in May or June; the larvæ feed throughout the summer, and into, in some cases, late autumn. The pupal state lasts from October till May or June of the following year. See Figs. 691 and 692.

Another Hawk-Moth to be mentioned in connection with the garden is the Death's Head (*Acherontia Atropos*). This, as noted under **Potato—Insects,** affects that vegetable; but it may also be found upon many other garden subjects, such as the Tea Tree, Tomato, the Common Jasmine, Privet, Elder, Common Mock Orange, Catalpa, &c. It is the largest of all British Moths, as well as one of the most interesting from a naturalist's standpoint. For apart from the peculiar markings which have given rise to the popular name it bears, the insect is capable of giving utterance to a squeak not unlike that emitted by a mouse. The Moth's fondness for sweets sometimes seals its doom, for cases are on record where it has entered a bee-hive and been immured by the Bees sealing it up with wax. On the Continent the Death's Head is oftener found than here. The Moth chiefly belongs to the South of England, and judging by the number of pupæ unearthed (the perfect insect is not so often seen) at Potato-digging time, it is far more abundant some seasons than others. The year 1900 was an abundant one. The eggs are laid from May to July; the larvæ feed from May till September, choosing the evening for their feast; and the pupal state extends from August till June or July, the perfect insects appearing in May and June. Lucas, in his interesting work upon "British Hawk-Moths," says with regard to the perfect insects, those emerging in May and June would have spent the winter in pupal condition; while the September, October, and November specimens would be new in almost all cases, while the July and August ones might belong to either set. As the Moth itself was illustrated in Vol. III., we give the larva and pupa only at Fig. 693.

The above practically represent all the British Hawk-Moths against which any charge of destroying garden plants can be laid. There are two or three other members of this beautiful family which frequent our gardens for the purpose of sipping the sweets of some of our commonest bed and border plants. The Humming-Bird Hawk-Moth (*Macroglossa stellatarum*), Fig. 694, may often be seen by the observant hovering over Pelargoniums, Fuchsias, Larkspurs, Evening Primroses, Honeysuckle, and others. This Hawk-Moth is of somewhat sombre colouring as compared with some of its relatives. The fore-wings are of a smoky-brown, while the hind-wings are of dull copper. The insect is noteworthy from the fact that it is to be found at almost all seasons, for on even bright days in winter it will venture forth. The above list of plants are only those which in gardens are most likely to tempt it to sip their sweets. In the country the plant to attract it is the Viper's Bugloss (*Echium vulgare*). This Hawk-Moth is marvellous of flight, and it is this which has given rise to the very appropriate popular name it bears. The larva may be found from June to September. It is

FIG. 690. LARVA AND PUPA OF LIME HAWK-MOTH.

Sphingidæ—*continued.*

FIG. 691. PRIVET HAWK-MOTH.

green, thickly dotted with white, with a white line on each side, and a stiff, rough, bluish horn. The pupa is dark brown, and this condition is assumed just beneath the surface of the ground. The Moth itself is a day-flier, though it also ventures out after sunset. As food-plants, however, none of the usual garden occupants over which it hovers seem affected by the larvæ.

With the exception of the Bedstraw Hawk-Moth (*Deilephila galii*), the last of the Hawk-Moths to merit any notice in reference to the garden is the large Convolvulus Hawk-Moth (*Sphinx convolvuli*). This is an erratic species here, some seasons being fairly abundant, and at others very scarce. Those who know its habits may, in favourable localities, observe it hovering in the evening over the Japanese Lily (*Lilium auratum*), Carnations, Honeysuckle, Tobacco (*Nicotiana affinis*), and many another sweet-scented occupant of our gardens. Its chief food-plants, however, are the Bind-weeds (*Convolvulus sepium* and *C. arvensis*), two common and very undesirable weeds of many gardens. The larvæ are seldom found, however. We illustrate the perfect insect at Fig. 695.

FIG. 692. LARVA AND PUPA OF PRIVET HAWK-MOTH.

Deilephila galii is a rare garden visitor, but, like its relatives above-named, frequents sweet-scented plants like Jasmine, Sweet William, and Honeysuckle, as well as its ordinary food-plants, the Bedstraws. It resembles *D. euphorbiæ* in colour, markings, and shape. The fore-wings are yellowish, with an olive-brown band from the tip to the hind margin, which the upper edge meets not far from the base of the wing, this being a clear point of distinction from *D. euphorbiæ*; between this band and the edge of the wing the colour is grey. Along the costal margin is a band of olive-brown. The The hind-wings in ground-colour are yellow, with a tinge of pink. They are black at the base, and have a streak of the same colour extending from the tip to the anal angle. Between the black is a reddish-pink suffused patch towards the base of the wing, and a white patch at the inner margin. The fringe on the

FIG. 693. LARVA AND PUPA OF DEATH'S HEAD MOTH.

hind-wings is white, as it is also on the inner margin of the fore-wings, that on the hind margin of the latter

FIG. 694. HUMMING-BIRD HAWK-MOTH.

being brown, with the extreme edge white. Head and thorax are brown, with a white stripe on the sides.

Abdomen is brown, adorned on the sides by four interrupted bands near the thorax, alternately black and white, and for the rest of the way to the anal extremity by a white edging behind each segment. The back has in the central line a few small white spots. The legs are light in colour.

SPIDER LILY, GOLDEN. *See* **Lycoris.**

SPIDER ORCHID. *See* **Bartholina pectinata.**

SPIKE GRASS. *See* **Uniola.**

SPILANTHES. *S. Acmella* is the correct name of *S. oleracea.*

FIG. 695. CONVOLVULUS HAWK-MOTH.

SPILOCÆA POMI. *See* **Pear—Fungi.**

SPILONOTA ROBORATA. *See* **Rosa—Insects.**

SPINDLE-TREE SCALE. *See* **Scale Insects.**

SPINOVITIS. Included under **Vitis** (which *see*).

SPIRÆA. To the species and varieties described on pp. 474-8, Vol. III., the following should be added:

S. arbuscula (little tree). *fl.* bright rose-red, disposed in small, compact corymbs, terminating the branches. Stems erect, wiry. Washington, Oregon, &c., 1897. An alpine shrub. (G. & F. 1897, p. 413, f. 53.)

S. arguta (sharp).* *fl.* of the purest white, disposed in very numerous, compact spikes. *l.* obovate, bright green, slightly toothed. Hybrid. The best white Spiræa grown; it is of good habit and very free-flowering. (G. C. 1897, ii., p. 3, f. 1.) SYN. *S. multiflora alba.*

S. astilboides is by some now regarded as a form of *S. Aruncus*, but is kept distinct at Kew.

S. a. floribunda (abundant-flowered).* A very vigorous and free-flowering sort, said to be a hybrid between *S. astilboides* and *Astilbe japonica*. Very useful for forcing. 1891. (R. H. 1895, f. 184.)

S. a. Lemoinei (Lemoine's). A garden hybrid between *S. Thunbergii* and *S. floribunda*. (R. H. 1895, f. 185.)

S. bracteata (bracted). The correct name of *S. media rotundifolia*. (B. M. 7429.) SYNS. *S. nipponica* (of gardens), *S. rotundifolia flore-albo* (of gardens).

S. bullata (bullate). *fl.* dark pink or claret-coloured, in much-branched, dense, terminal corymbs; pedicels short, villous, bracteolate. Summer. *l.* sub-sessile, ½in. long, coriaceous, glabrous, dark green and bullate above, paler beneath, ovate-oblong, crenate; nerves pinnate, very prominent on the under-surface. Branches erect, wiry, cylindric, densely clothed with reddish-brown down. Japan. A dwarf shrub, 1ft. to 1½ft. high. (R. G. 1215.) SYN. *S. crispifolia* (of gardens).

S. Bumalda (Bumalda). A variety of *S. japonica*.

S. camtschatica (Kamtschatkan).* *fl.* white, sweetly scented, larger than those of *S. Ulmaria*, corymbose; sepals reflexed, pilose; carpels very hairy. *l.* palmately lobed, 6in. wide, 4in. long; upper cauline ones somewhat hastate or lanceolate; petioles appendiculate. *h.* 4ft. to 10ft. Kamtschatka and Behring's Island, 1889. A stately perennial. SYN. *S. gigantea* (of gardens).

S. c. himalensis (Himalayan). A synonym of *S. vestita*.

FIG. 696. SPIRÆA DISCOLOR ARIÆFOLIA.

Spiræa—*continued.*

S. chamædrifolia oblongifolia (oblong-leaved) A synonym of *S. media.*

S. chinensis. The correct name is *S. dasyantha.*

S. confusa (of gardens). A synonym of *S. Van Houttei.*

S. crispifolia (crisped-leaved). A garden synonym of *S. bullata*

S. dasyantha (thick-flowered). The correct name of *S. chinensis.*

S. digitata (digitate). *fl.* red, in a coarctate, branched corymb; style rather thick, capitate. July. *l.* pinnatisect, tomentose beneath; terminal segment seven-lobed, the lateral ones five-lobed. *h.* 2ft. Eastern Siberia, 1823. Allied to *S. palmata.* Perennial.

S. discolor ariæfolia. Of this well-known Spiræa, described in the body of the work, we give an illustration (Fig. 696).

S. expansa (expanded). A synonym of *S. bella.*

S. gigantea (gigantic), of gardens. A garden synonym of *S. camtschatica.*

S. Humboldtii (Humboldt's).* *fl.* white, minute, exceedingly numerous, borne on the sides of long, slender, white stalks arranged in a paniculate form. *l.* large, spreading, triangular, bipinnate; segments lanceolate, acuminate, serrated. Habitat not recorded, 1884. A fine perennial.

S. japonica Anthony Waterer.* A specially good variety, of dwarf, compact habit. The flowers are not affected by the sun as are those of other Spiræas. It is really a fine form of *S. j. Bumalda.*

S. j. Bumalda (Bumalda).* *fl.* of a beautiful deep rose-pink, disposed in very large corymbs. *h.* 2ft. A magnificent compact and rapid-growing variety, very useful for edgings to beds and shrubberies. In the KNAP HILL variety the flowers are paler, with a deeper centre, and the whole plant is very compact. 1891.

S. j. glabrata (glabrous).* *fl.* deep pink, very freely produced in dense corymbs. *l.* deep green. A fine variety for massing, being of dense habit.

S. j. ruberrima (very red).* *fl.* pink, freely produced.

S. kamtschatica. *See* **S. camtschatica.**

S. lanceolata (lanceolate), of Commerson. A synonym of *S. cantoniensis.*

S. Lindleyana is synonymous with *S. sorbifolia.*

S. Margaritæ (Margaret's). *fl.* soft pink. A plant of free growth, which should be allowed plenty of room to develop; it carries a great quantity of blossom.

S. media rotundifolia. The correct name is *S. bracteata.*

S. mongolica (Mongol). A vigorous-growing species, bearing an abundance of flowers along the pendulous shoots late in the season. China.

S. multiflora alba (many-flowered, white). A synonym of *S. arguta.*

S. nipponica (Japanese). A garden synonym of *S. bracteata.*

S. pikoviensis (Pikov). A hybrid between *S. crenata* and *S. hypericifolia.*

S. pinnata (pinnate), of Mœnch. A synonym of *S. sorbifolia.*

S. rotundifolia flore-albo (round-leaved, white-flowered). A garden synonym of *S. bracteata.*

S. salicifolia Billardi (Billard's). *fl.* bright red, much larger than in the type; spikes long and strong. June to September. A vigorous form.

S. Schinabecki (Schinabeck's). A garden hybrid. 1834.

S. Ulmaria variegata (variegated). *l.* variegated green and creamy-yellow.

S. ulmifolia (Elm-leaved). A form of *S. chamædrifolia.*

S. Van Houttei (Van Houtte's). *fl.* white. May. A garden hybrid between *S. media* and *S. trilobata.* It is largely grown as a forcing plant under the name of *S. confusa.*

SPIRANTHES. To the species and varieties described on pp. 478-9, Vol. III., the following should be added. *S. cinnabarina* and *S. colorans* thrive under greenhouse treatment.

S. albescens (whitish). *fl.* green, with a brown-tipped lip, hairy; sepals lanceolate; petals linear, forming, with the dorsal sepal, the galea; lip ligulate, dilated in front, the apex obtusely triangular; raceme few-flowered. *l.* petiolate, oblong, acute, spotted white. Colombia, 1885. SYN. *S. leucosticta.*

S. colorata is the correct name of *S. colorans.*

S. gemmipara (bud-bearing). A synonym of *S. Romanzoffiana* [the correct spelling].

S. leucosticta (white-spotted). A synonym of *S. albescens.*

SPIXIA. A synonym of **Centratherum** (which *see*).

SPLASHED. Having various-sized, broken stripes; *e.g.*, Apples.

SPLITGERBERA. A synonym of **Bœhmeria** (which *see*).

SPONDIAS. *S. cytherea* is a synonym of *S. dulcis*; *S. Mombin*, of *S. lutea*; and *S. Myrobalanus* (of Jacquin), of *S. purpurea*.

SPORLEDERA. A synonym of **Ceratotheca** (which *see*).

SPOT. A popular name for many diseases, usually of fungoid origin. One, for instance, attacking the fruit of Tomatoes is known as Spot. There is a black patch about the centre or eye of the green, and also the ripe, fruit. So far, no remedy has been discovered. It attacks fruit both under glass and outside, growing in both rich, moderate, and poor soil, and the application of special Tomato manures have no apparent effect in preventing or stopping its increase. It is advisable to pick off and burn any infested fruit at once when the Spot is detected and burn them. This seems to be the most effectual mode of dealing with this fungoid enemy. Carnations, Pelargoniums, Orchids, and many other plants are attacked by a fungus that produces black Spots in the foliage and stems. *See* **Anthracnose.**

SPRAYING. For years past growers of Hops, fruit, vegetables, &c., have realised that the quality of their crops depends largely upon the efficiency of the cleansing apparatus employed, and many methods have been more or less successfully adopted for the Spraying of the crops with insecticides or with fungicides; but in each of these devices weak points have been discovered which have caused growers to wish for a really infallible plant for mechanical Spraying.

Judging from the results produced, the most efficient system hitherto employed is undoubtedly the hand-pump system, consisting in the employment of pumps placed in portable cisterns containing mixtures of water and chemicals, with one or two spray jets attached to each pump. The pumps are each worked by one or two men, and another man is required to manipulate each spray jet. One disadvantage attending the use of this system, however, is the heavy cost of the labour required to work it; while the work of conveying the insecticide or the fungicide mixture to the pumps, and moving the pumps themselves, occupies a great deal of time. This is a serious matter, as when the Hops are attacked by insects the washing should be done quickly—the sooner the better—to avoid loss to the grower.

Spraying—*continued.*

The best system, at any rate for use on a large scale, is that introduced by the well-known firm of engineers, Messrs. Merryweather and Sons, of London, and illustrated in Figs. 697, 698, and 699. It consists of a light, portable, steam pumping-engine in connection with a system of easily-movable wrought iron piping, and enables from twelve to twenty-four sprays to be worked simultaneously. The piping is in convenient lengths, each length being fitted with a piece of flexible anti-caustic hose at each end and quick-hitching gunmetal couplings. Tee-pieces, each with flexible hose and two couplings, are provided, and, in work, are connected between two lengths of pipe. Each tee-piece has cock attached, and by means of breechings two lines of hose pipe can be led away from each cock to supply two jets or sprays. This system of pipes can be laid down between the rows of Hops, fruit trees, or other crops by a few men in a very short time, and enables the washing to be done rapidly and thoroughly, there being no small hand-pumps to be filled with insecticide, causing work to be stopped every few minutes; the sprays in this case being worked continuously.

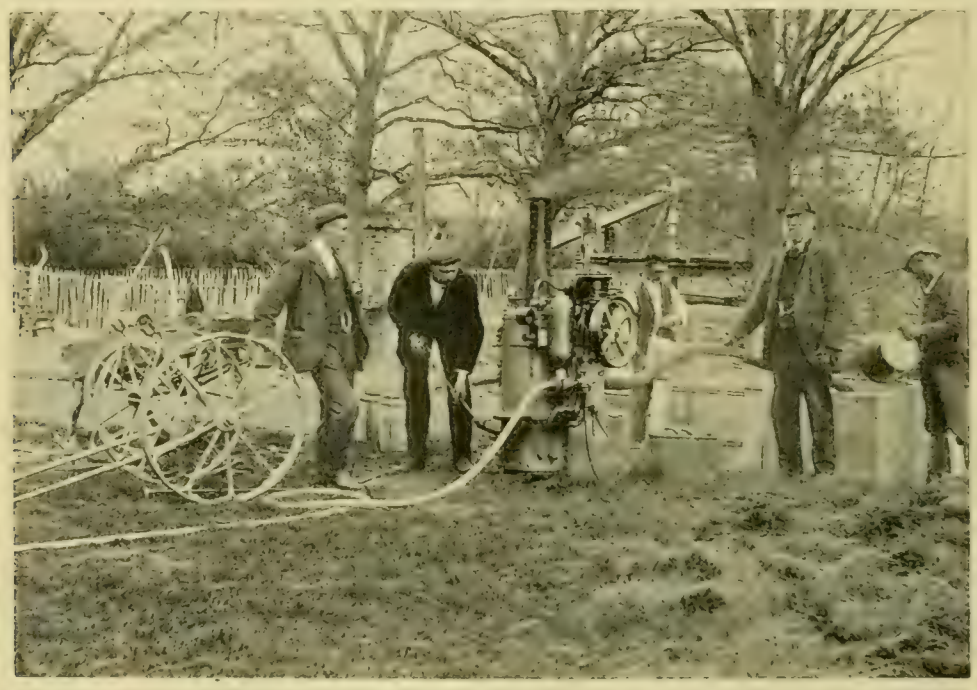


FIG. 697. MERRYWEATHER'S "VALIANT" STEAM PUMPING-ENGINE—At work on the Farm of Mr. Isaac Reader, Paddock Wood, Kent.

The insecticide or the fungicide is mixed up in a tank placed on the ground alongside the engine, and pumped continuously into a portable pipe system. Each man has a long jet pipe with a spray nozzle, and a cock is fitted to each pipe, so that any of the jets can be shut off independently. The pump is of rustless gunmetal, with copper air vessels and gunmetal pipe connections. It is fitted with a patent injector for keeping the boiler supplied with water, as well as with a lever hand-pump to fill boiler when starting work. An important feature is that one or the whole of the sprays may be shut off

Spraying—*continued.*

at once without stopping the engine, and thus the man in charge of the engine can keep one or the whole of the jets supplied at an even pressure. The rubber of the hose being of the best quality, it is not affected by either Bordeaux Mixture or the clear solutions of copper similarly employed. In cases where it is necessary to use Paris Green or similar arsenical preparations that are heavy and not soluble, an agitator is fixed in the receptacle in which they are held, and this is worked by means of a belt from the fly-wheel of the engine.

With Merryweather's apparatus six men can thoroughly spray twelve acres of large Cherry- or Apple-trees, taking 100 trees to the acre, in six hours, or six acres of Hops

Spraying—*continued.*

the operator wherever required, under glass or outside. The machine will hold about four gallons of liquid, and is easily carried on a man's back. The pump-handle comes under one arm, and the sprayer, with the tube attached, under the other. It is most easy to work, and sends out a fine mist-like spray with considerable force. In the hands of a capable man, the spray can be made to fall on either the upper or the lower side of the foliage, infested with insect pests or fungi. For Roses, fruit trees on walls, and low-growing subjects, this apparatus is extremely useful and very economical, as much less liquid insecticide or fungicide is wasted than is the case with the ordinary syringe or garden-engine. Another advantage is that it

FIG. 693. MERRYWEATHER'S SPRAYING PLANT—At work on Apple-Trees at the Farm of Mr. Isaac Reader, Paddock Wood, Kent.

in the same time. The plant is also available for Spraying Potatoes and root-crops, Tea plantations, Vines, Tobacco plants, &c. The engine may be employed for irrigation work or any pumping duties on an estate or a farm. As a fire-engine it is also very valuable, the boiler being capable of raising steam from cold water to working pressure in ten minutes from the time of lighting the fire. It will deliver 100gals. of water per minute, and throw a powerful jet to a good height. By throwing the pump out of gear the engine can be used to drive any machinery, such as chaff-cutters, cream-separators, circular saws, &c.

The small Knapsack Engine is a most useful apparatus to have, as it can rapidly be moved about on the back of can readily be turned to any part, where the larger engines on wheels could not be taken.

For Spraying larger trees in quantity with insecticide, there are engines specially made by Messrs. Boulton and Paul, of Norwich See Fig. 700. In this case, the engines are fitted with powerful pumps, having automatic dashers attached; these keep the liquid in constant agitation during use, a most important point when employing Paris Green or London Purple, thus ensuring a uniform strength. If the Stott Sprayer is fitted to these engines, a fine spray is delivered that will quickly moisten every part of the tree. *See also* **Syringe.**

Another effective Spraying-pump is known as Gould's Pomona. It is fitted with an agitator, so that insecti-

Spraying—*continued.*

FIG. 699. MERRYWEATHER'S HOP-WASHING PLANT—At work at Rodmersham, Kent. Men spraying with hose taken off main pipe.

cides and fungicides may be kept constantly in a state of suspension. For even standard fruit trees it is excellent, as being fitted with a 10ft. hose, an extension rod of bamboo, and a double Vermorel nozzle, a fine mist-like spray can be concentrated upon affected spots or trees as high as 30ft. For Spraying Potatoes it is equally adapted.

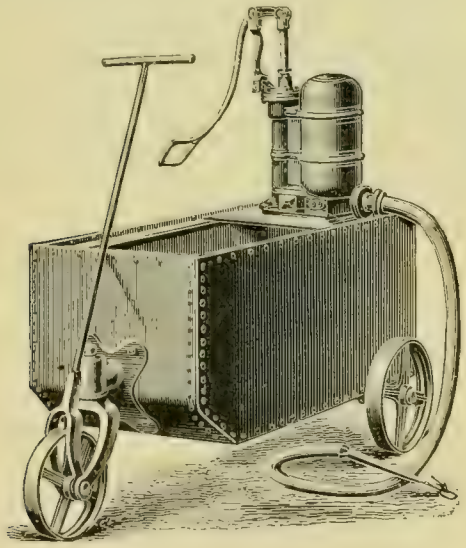


FIG. 700. BOULTON AND PAUL'S HAND SPRAYING-MACHINE.

SPREKELIA. This is now, according to J. G. Baker, a monotypic genus, the species being *S. formosissima* (SYN. *S. Heisteri*).

S. Cybister. The correct name is *Hippeastrum Cybister.*

S. formosissima glauca (glaucous) has smaller and paler flowers than in the type, and glaucous leaves. (B. R. 1841, t. 6.)

S. f. Karwinskii (Karwinsky's). *fl.* brilliant red, the segments keeled and bordered with white.

S. f. ringens (gaping). *fl.* pendent, the upper segment having a central yellow band.

SPRING STARFLOWER. *See* **Triteleia uniflora.**

SPRINGTAILS. A common name for certain families of the *Collembola* characterised by possessing the power of leaping. They are known respectively as *Poduridæ* and *Smynthuridæ*. *See also* **Collembola.**

SPROUT. Any quickly-grown part. Brussels Sprouts are commonly referred to in commerce as "Sprouts."

SPRUCE, DOUGLAS. *See* **Pseudotsuga.**

SPRUCE, HEMLOCK. *See* **Tsuga.**

SPRUCE GALL APHIS. *See* **Chermes of the Apple.**

SPURLESS VIOLET. *See* **Viola hederacea.**

SPURRING. The cutting back to a few buds of side-shoots on fruit trees produces spurs, and the operation of pruning thus is termed Spurring-in. As a rule, trained fruit trees produce the most and finest fruit on the spurs; but with continual pruning year after year, the spurs are very apt to become too congested to properly mature the wood, and little or no fruit is produced. When this is the case, the spurs should be curtailed in size. All fruit trees, except Black Currants, Morello Cherries, Peaches, and Nectarines, answer on the spur system of pruning.

STACHYCHRYSUM. A synonym of **Adenanthera** (which *see*).

STACHYS. To the species described on pp. 482-3, Vol. III., the following should be added:

S. affinis (related). A synonym of *S. tuberifera.*

S. Betonica alba (white). This is a white variety of the type.

S. chrysantha (yellow-flowered). *fl.* lemon-yellow; whorls four- to six-flowered, in rather loose spikes. *l.* shortly petiolate, roundish-ovate, slightly crenate. Greece, 1897. A dwarf, half-hardy, tufted, many-stemmed, densely woolly perennial.

S. lavandulæfolia (Lavender-leaved). *fl.* rose-purple, pubescent outside; whorls two- to six-flowered. *l.* rather obtuse, softly canescent; cauline ones petiolate, oblong-lanceolate, entire, narrowed at both ends; floral ones sessile, ovate-lanceolate. Armenia, &c A dwarf, procumbent under-shrub.

S. nivea (snowy). *fl.* white, sessile; calyx snow-white; whorls many, four- to six-flowered; raceme often 6in. long. June and July. *l.* sub-sessile, entire, the lower ones oblong, obtuse, narrowed at base, the medium ones 1in. to 1½in. long, the floral ones lanceolate. Branches 6in. to 12in. long, erect. Caucasus, 1820. A densely woolly-tomentose, much-branched, hardy under-shrub. SYN. *Betonica nivea.*

S. sibirica is, according to the Kew authorities, a form of *S. germanica.*

S. Sieboldi (Siebold's). A synonym of *S. tuberifera.*

S. tuberifera (tuber-bearing). Chinese or Japanese Artichoke; Crosnes. *fl.* pink, spicate, rarely produced. *l.* ovate, acute, reticulated, harsh. *h.* 1ft. to 1½ft. China and Japan, 1885. In this species the tubers, which are used as a vegetable, are really the thickened extremities of the underground branches, and are marked by buds or eyes at the nodes, as in Potatoes. They are produced in great profusion and bear a considerable resemblance to the Fir-apple or Asparagus Potato. Each tuber has a bud at the end, and this curves upwards to form a new shoot. (G. C. 1883, iii., pp. 13, 16, f. 1.) SYNS. *S. affinis, S. Sieboldi.* For culture, *see* **Crosnes.**

S. tubifera. Another spelling of *S. tuberifera.*

STACHYTARPHETA. *S. orubica* is the correct name of *S. aristata*; *S. cayennensis* should be spelt *S. cajanensis*; *S. jamaicensis* is properly called *S. indica*; and *S. urticifolia* is synonymous with *S. indica.*

STAGANOSPORA. *See* **Sphæropsidæ.**

STAG-HEADED. A term applied to trees which are dying at the top.

STANDARDS. A term applied to many trees and shrubs grown on a clear stem, as, for instance, Apples, Pears, Plums, Cherries, Damsons, &c., amongst fruit trees. The distance apart at which these trees should be planted must be determined by the character of the soil and the varieties. If the soil is deep and fertile, all the above trees may be put 40ft. apart each way; but if it is of moderate quality, and the varieties are compact in habit, 30ft. apart will be sufficient. Half-Standards are trees with stems 3ft. or 4ft. long, and planted from 15ft. to 20ft. apart. This class of tree finds considerable favour amongst market growers, as the trees come into bearing more rapidly than the full Standards, and the trees are less exposed to gales, while the fruit is more easily gathered. Amongst many other trees and plants grown as Standards are Gooseberries grafted on *Ribes aurea*, Currants, Roses, Hollies, Heliotrope, Pelargoniums, &c. See also Vol. III.

STANGERIA. *S. Katzeri* and *S. schizodon* are now regarded as distinct species and not as forms of *S. paradoxa.*

STANHOPEA. To the species described on pp. 486-7, Vol. III., the following should be added:

S. Amesiana (Capt. Ames'). A synonym of *S. Lowii.*

S. cymbiformis (boat-shaped). *fl.*, sepals and petals dirty straw-colour, connivent, the latter undulated, with a few small, blood-red spots; hypochil yellow; mesochil and epichil white, spotted with purple; raceme often many-flowered, lax. Central America. Allied to *S. Ruckeri.* (R. X. O. ii., t. 124.)

S. Fregeana (Frege's).* *fl.* of an intense egg-yolk-colour, irregularly spotted with dark purple, two to a peduncle; sepals oblong-triangular; petals shorter, acute, usually twisted; lip white, with small, dark purple spots. *l.* and pseudo-bulbs as in *S. tigrina.* Mexico. (R. X. O. i., t. 82.)

S. Fuerstenbergiæ (Mme. Fuerstenberg's). *fl.* white, blotched with crimson at the base of the lip. In other respects this species resembles *S. oculata.* Habitat not recorded, 1899.

Stanhopea—*continued.*

S. graveolens Leitzeri (Leitzer's). *fl.*, sepals and petals of a more decided yellow than in the type; the orange mark on the hypochil replaced by a faint red band, the front lobe white, dotted with purple. Brazil, 1891. (R. G., t. 1345.)

S. Haseloviana (Haselow's).* *fl.* very large, five to seven in a raceme; sepals pale, with reddish dots, rounded; petals pale rose, erect, oblong; lip elongated, pale rose, with darker spots, the lateral lobes horned, the middle one ovate, obtuse; column winged and lobuled at summit. *l.* petiolate, oblong-lanceolate. Peru, 1896. (B. M. 7452; R. X. O. i., t. 72.)

S. impressa (impressed). *fl.* buff-yellow, slightly spotted with purple and blotched with orange on the lip; sepals and petals 2in. long; lip three-lobed, 2in. long; bracts large, ovate; scape 6in. long, four-flowered. *l.* elliptic-oblong, 1ft. long. Pseudo-bulbs 3in. long. Western Andes, 1898. Allied to *S. inodora.*

FIG. 701. STANHOPEA INSIGNIS.

S. insignis. This beautiful species, described in Vol. III., is illustrated at Fig. 701.

S. Jenischiana (Jenisch's). A synonym of *S. Bucephalus.*

S. Lowii (Low's).* A striking species of the *ecornuta* section, having purple spots on the hypochil and whitish-buff sepals and petals. Colombia, 1893. (G. C. 1893, xiv., pp. 630, 689, f. 107.) SYN. *S. Amesiana.*

S. maculosa (spotted). A synonym of *S. Devoniensis.*

S. Madouxiana (Madoux').* *fl.* creamy-white, spotted with pink, fragrant, 6in. across; lip tinged with dark purple; scape pendent, bearing one or two flowers. *l.* 20in. to 30in. long, 5in. to 9in. broad. Pseudo-bulbs ovoid. Colombia, 1898. (G. C. 1893, xxiv., p. 134, f. 34.)

S. Moliana (Moly's). *fl.* having the sepals yellowish-white and the petals white, both marked with annular, rose-coloured spots; lip white, dotted with purple. Peru, 1893. Allied to *S. Ruckeri* and *S. Wardii.* (L. vii., t. 331.)

S. nigripes (black-stalked). *fl.*, sepals and petals yellow, with many small purple blotches, and a pair of black, eye-like spots on the hypochil, the cavity also being black. Habitat

Stanhopea—*continued.*

not recorded, 1894. Allied to *S. Wardii*, which it resembles in all parts but the lip.

S. Rodigasiana (Rodigas'). *fl.* 6in. across, solitary on pendulous scapes; sepals creamy-white, spotted with rose and purple; column green, spotted with purple; lip dark purple, with an ivory-white blotch and numerous red spots on the mesochil. June. Colombia, 1893. (B. M. 7702; G. C. 1893, xxiv., pp. 14, 73, f. 9.)

FIG. 702. STANHOPEA TIGRINA.

S. tigrina. This beautiful basket-Orchid, described in Vol. III., p. 436, is shown in both flower and bud at Fig. 702.

STAPELIA. African Toad Flower. *Podanthes* is now included hereunder. *See also* **Diplocyatha.** To the species described on pp. 488-9, Vol. III., the following should be added. The changes in nomenclature are based on the "Index Kewensis."

S. albicans (whitish). This is an albino form of *S. angulata.*

S. cupularis (cup-like). A new species, resembling *S. variegata*, from which it is distinguished by the erect, acute margin to the corona. 1897.

S. Desmetiana (De Smet's).* *fl.*, corolla 4½in. to 5½in. across, pubescent and pale green or purplish at back, the inside purplish-red with transverse pale yellowish lines, the entire surface clothed with long, purple hairs; cymes sub-sessile. Stems 3in. to 9in. high, 1in. or more thick, pubescent, four-angled, sinuate-toothed. Before 1874.

S. erectiflora (erect-flowered). *fl.* purplish-brown, densely white-hairy, very small; corolla Turk's-cap-like; cymes usually one- to four-flowered. Stems 4in. to 7in. high, ¼in. thick, four-angled, branching at base, flowering from their sides. About 1877.

S. Gussoniana is synonymous with *Boucerosia Gussoniana* (described in Vol. I. as *B. europæa*).

S. Hystrix (spiny). A synonym of *Huernia Hystrix.*

S. longidens (long-toothed). *fl.* greenish-yellow, spotted with purple, disposed in sessile cymes 1½in. in diameter. Stems 6in. long, four-angled; angles furnished with long, ascending, stout teeth 1in. long. 1895. Allied to *S. Woodii.* (G. C. 1893, xxiv., p. 7.)

S. marmorata (marbled). *fl.* blood-red, yellow-striped, very fœtid; corolla very spreading, half-quinquefid, 2in. in diameter; peduncles solitary in the forks of the young branchlets. July. Branches numerous; branchlets glabrous, glaucous, the older ones procumbent, tetragonal, with approximate, very obtuse but mucronate teeth. *h.* 1ft. 1820.

S. pedunculata is the correct name of *S. lævis.*

S. picta is the correct name of *S. anquinea.*

S. pilifera (hair-bearing). A synonym of *Trichocaulon piliferum.*

S. pulchella (rather pretty).* *fl.* light yellow, dotted with purplish-brown; corolla five-cleft, the segments triangular; corona small, raised about half a line above the general surface. Stems resembling those of *S. normalis.* 1882.

Stapelia—*continued.*

S. pulla (dark). A synonym of *Boucerosia mammillaris.*

S. Scilla (Scilla). *See* **S. variegata.**

S. variegata is the correct name of *S. Curtisii. S. Scilla* is a form similar to this, but the spots are confluent into longitudinal stripes.

S. Woodii (J. M. Wood's). *fl.* three or four in sessile cymes; corolla dark purplish-brown, 1½in. across, nearly flat, with a few yellowish dots. Stems 1½in. to 3in. long, mottled with purple, four-angled, stoutly toothed. 1892.

S. annulata, S. atrata, S. trifida, and *S. trisulca* (*S. scutellata*) have been introduced, but are not in general cultivation.

STAPHYLEA. To the species described on pp. 489-90, Vol. III., the following should be added:

S. Coulombieri (Coulombier's). Nearly allied to *S. colchica*, from which it differs in its more globular flowers, with broader and shorter sepals and petals, and in its later period of flowering. Really intermediate between *S. colchica* and *S. pinnata.* 1887. Garden variety.

S. elegans Hessei (Hesse's). Probably a hybrid between *S. Coulombieri* and *S. pinnata.* 1898.

STAR GRASS. *See* **Aletris.**

STAR HEAD. *See* **Scabiosa.**

STAR OF JERUSALEM. *See* **Tragopogon pratensis.**

STAR THISTLE. *See* **Centaurea.**

STARWORT, ITALIAN. *See* **Amellus Lychnitis.**

STATICE. To the species described on pp. 491-3, Vol. III., the following should be added. *See also* **Acantholimon** and **Armeria.**

S. arborescens is a variety of *S. fruticans.*

S. australis (Southern). The correct name of *S. sinensis.*

S. Candelabra (candelabra). A synonym of *S. Suworowi.*

S. caspia (Caspian). *fl.* pale blue; spikelets two- or three-flowered, in spikes at the ends of the crowded branchlets. July. *l.* obovate or lanceolate-spathulate, narrowed to the petioles. Caspian region. Plant granular-scabrous, varying in height to 1ft. Rockery.

S. eximia turkestanica (Turkestan). *fl.* lilac, in short, dense, terminal spikes. *l.* lanceolate, acute, 6in. to 8in. long, 1½in. to 2in. broad, forming a rosette. Stems 2ft. to 2½ft. high. Turkestan, 1883. (R. G., t. 1270, f. *d-m.*)

S. Gmelini (Gmelin's).* *fl.* dark blue, small; spikelets about two-flowered, in short, densely imbricated spikes; scape terete below, angled above, bearing a corymbose panicle. June to August. *l.* glabrous, broadly ovate or obovate, one-nerved, very obtuse, nearly or quite sessile. *h.* 1½ft. to 2ft. Eastern Europe and Russian Asia, 1796.

S. Limonium (Limonium). Common Sea Lavender. *fl.* bluish-purple, numerous, in short, rather loose spikes at the ends of the branches; panicle corymbose; scape erect, leafless, 6in. to 12in. or more in height. Summer and autumn. *l.* 2in. to 6in. long, obovate or oblong, entire, glabrous, narrowed to a long stalk. Stock short and thick. Europe (Britain), &c.

S. L. alba (white). This white variety is a desirable garden plant.

S. minuta (minute). *fl.* red; spikelets two or three, in a terminal, erect spike. June. *l.* rosulate, small, obovate or lanceolate-spathulate, obtuse or retuse. Mediterranean region, 1658. A very tiny, rockery species.

S. minutiflora (minute-flowered). *fl.*, spikelets about two-flowered, in short spikes, disposed in a short panicle. Summer. *l.* small, densely rosulate, obovate or oblong-spathulate, very obtuse or retuse. Mediterranean region. Rockery.

S. monopetala (one-petaled). A synonym of *Limoniastrum articulatum.*

S. sinensis. The correct name is *S. australis.*

S. sinuata. Of this species there are now several very pretty and useful colour varieties.

S. superba (superb). A hardy annual, closely resembling *S. Suworowi*, but having the spikes densely crowded into a pyramidal panicle. 1837. (R. G. 1887, p. 666, f. 170.)

STATICE ARARATI (Mount Ararat's). This plant, regarded by some as identical with *Acantholimon glumaceum*, is accorded specific rank in the "Index Kewensis."

STATIONS. In former years, careful attention was paid to the preparation of Stations for fruit trees by forming a bed of concrete, stones, brickbats, slabs, &c., at the bottom of the hole prepared for planting a tree, with the view of preventing the tap-root from penetrating into the subsoil. This is seldom done now, as the old plan was not only somewhat costly, but there was always the risk of a violent wind blowing the trees over, even when large, if not properly stayed. In preparing Stations at the present time, the skilful cultivator makes sure that the drainage is good, so that all excess of water passes off quickly, then a hole is excavated rather wider than is absolutely necessary for the roots to go in without bending any back, the sides and bottom of the holes being well broken up. The tree is then planted, the upper roots being only an inch or two below the surface, the soil is made firm about the roots, and the tree securely fixed to a stake or other support until it is established. A mulch of strawy manure completes the operation, and fruit trees, Roses, &c., planted in such prepared Stations at the proper season seldom disappoint the planter.

STAUROPSIS. To the species described on pp. 493-4, Vol. III., the following should be added:

S. lissochiloides (Lissochilus-like). The correct name of *S. Batemanni.*

S. philippinensis (Philippine). *fl.* 1in. across, solitary, produced from the axils of the leaves; sepals and petals reddish-brown; lip purple and white, with a hairy keel. *l.* elliptic-oblong, 1½in. long. Stem erect-climbing. Philippine Islands, 1894.

S. undulata (waved). The correct name of *Vanda undulata.*

S. Warocqueana (Warocque's).* *fl.* of moderate size, disposed in rich racemes; sepals and petals yellow, dotted with pale reddish-brown; lip white, spotted with rose. New Guinea, 1892. A beautiful species. (L. vii., t. 319.)

STEEPING. Seeds that are encased in very hard shells, like those of the Cannas, have their germination quickened very much by being soaked for twenty-four hours in water before sowing. With softer seeds of the Pea and Bean type very little is gained in hastening germination by Steeping. Where birds are troublesome, the seeds are sometimes steeped in some obnoxious compound—paraffin for instance—but such preparations must be employed with caution, or the germinating power may be destroyed.

STEGANIA. *See* **Lomaria.**

STEIRONEMA (from *steiros*, sterile, and *nema*, thread; referring to the presence of staminodia alternating with the fertile stamens). ORD. *Primulaceæ.* A small genus (about five species) of hardy, leafy-stemmed perennials, natives of Europe and North America, formerly included under **Lysimachia** (which *see* for culture). Flowers yellow; peduncles slender. Leaves all opposite, but mostly in apparent whorls on the flowering branches (as in *Trientalis*).

S. heterophyllum (variable-leaved). The correct name of *Lysimachia lanceolata* and *L. ciliata.* SYN. *S. lanceolatum.*

S. lanceolatum (lanceolate). A synonym of *S. heterophyllum.*

STELLATE HAIRS. Hairs having several branches arranged in a star-like manner.

STELLERA. *S. Alberti* is a synonym of **Wikstræmia Alberti** (which *see*). *S. altaica* is a form of *S. Chamæjasme.*

STEMODIA. To the species described on p. 496, Vol. III., the following should be added:

S. durantifolia (Duranta-leaved). *fl.* bluish-purple, scarcely ¼in. long, disposed in terminal spikes. *l.* opposite or whorled, sessile, lanceolate, toothed, 1in. to 2in. long, varying in breadth. *h.* 1ft. to 1½ft. Tropical America, 1890. A greenhouse or half-hardy, very viscous annual, simply or paniculately branched.

STEMONA. To the species described on p. 496, Vol. III., the following should be added:

S. Curtisii (Curtis's). In habit and forms of leaf this resembles *S. tuberosa*, but the leaves are alternate, the petioles long and slender, and the flowers appear to be unisexual. India, 1892. (B. M. 7254.)

S. tuberosa (tuberous). The correct name of *S. gloriosoides.* (B. M. 1500.)

STENANDRIUM (from *stenos*, narrow, and *aner, andros*, a male; in allusion to the stamens). ORD. *Acanthaceæ.* A genus embracing about eighteen species of stove or greenhouse, mostly almost stemless herbs, natives of tropical and sub-tropical America; they are closely allied to **Eranthemum** (which *see* for culture of the species introduced). Flowers usually small, sessile, spicate; calyx five-parted; corolla obliquely five-lobed; stamens four, didynamous, included. Leaves usually radical or clustered at the base of the stem, entire.

S. igneum (fiery). *fl.* yellow, in terminal, elongated spikes. *l.* spreading, decussately opposite, ovate-oblong, obtuse, 4in. long, intense green above with reddish-yellow stripes along the midrib and nerves, below paler with prominent nerves; petioles short. Peru. (I. H. 1877, t. 266.)

S. Lindeni (Linden's). *fl.* yellow, disposed in erect, cylindric spikes. *l.* opposite, elliptic-obovate, obtuse, dark green, shading to paler green towards the centre, and marked with yellow veins. Peru, 1891. A foliage plant, of dwarf habit. (I. H. 1891, t. 136.)

S. Beeckmannianum (I. H. 1892, t. 166) and *S. Goosensianum* (I. H. 1893, t. 168) are garden hybrids, the latter having leaves variegated with green and yellow and margined with brown.

STENIA. This Orchid does best when grown in baskets or perforated pans, under similar conditions to those recommended for the *Pescatorea* section of Zygopetalums.

STENOGLOTTIS. This genus, described on p. 497, Vol. III., now embraces two species.

S. longifolia (long-leaved). *fl.* deep mauve-purple, having a fringed lip; scape erect, 1½ft. high, the upper half clothed with flowers. *l.* 6in. long, persistent, undulated, green, tinged with purple. Natal, 1889. (B. M. 7186; G.-C. 1894, ii., f. 72.)

STENOMESSON. According to J. G. Baker's latest revision of the genus, in his "Handbook of the *Amaryllidæ*," the number of species is limited to eleven, natives of the Andes. Flowers generally red or yellow, tipped with green, few or many in an umbel; perianth tube long, funnel-shaped; stamens inserted at the throat of the perianth tube; filaments united towards the base in a distinct cup, which is often toothed between them. To the species, &c., described on pp. 497-8, Vol. III., the following should be added:

S. angustifolium (narrow-leaved). A variety of *S. viridiflorum.*

S. flavum (yellow). *fl.* four to six in an umbel; perianth limb bright yellow, 1½in. to 2in. long, the tube dilated at the middle, the segments ¾in. long; peduncle slender, 1ft. long. May. *l.* oblanceolate, 1ft. long, 1in. broad, obscurely petiolate. Bulb 1in. in diameter. 1824. (B. M. 2641.) SYN. *Chrysiphiala flava* (B. R. 978).

S. f. curvidentatum. The correct name of *S. curvidentatum.* Edge of the staminal cup having a bifid tooth between each of the filaments. SYNS. *S. pauciflorum, Chrysiphiala pauciflora* (H. E. F. 132).

S. f. latifolium. The correct name of *S. latifolium.* Edge of the staminal cup having an entire tooth between each filament. Greenhouse. SYN. *S. vitellinum.*

S. fulvum (fulvous). A variety of *S. incarnatum.*

S. latifolium is a variety of *S. flavum.*

S. pauciflorum is identical with *S. flavum curvidentatum.*

S. recurvatum (recurved). *fl.* six to twelve in an umbel; perianth limb reddish-yellow, 2in. to 2½in. long, the segments ¼in. long; peduncle 1ft. to 1½ft. long. *l.* three to six, linear, 1ft. long, ¼in. broad, contemporary with the flowers. Bulb 1in. to 1¼in. in diameter. SYNS. *Carpodotes recurvatus, Chrysiphiala recurvata, Coburgia recurvata.*

S. Stricklandi is a synonym of *Stricklandia eucrosioides.*

S. trichromum (three-coloured). A variety of *S. incarnatum.*

S. viridiflorum angustifolium (narrow-leaved). *fl.* having stamens shorter than the perianth segments; style exserted. *l.* narrower than in the type. (B. M. 3966b, under name of *Callithauma angustifolium.*)

S. v. Elwesii (Elwes'). *fl.* having the staminal cup deeply six-cleft, and the lobes quadrate and emarginate. 1876.

S. vitellinum is identical with *S. flavum latifolium*; it requires greenhouse treatment.

STENOSPERMATION. To the species described on p. 498, Vol. III., the following should be added:

S. multiovulatum (many-ovuled). A variety of *S. Spruceanum.*

S. Spruceanum multiovulatum (Spruce's, many-ovuled). *fl.*, spathe white, 6in. long, borne on a peduncle 1ft. to 1½ft. long. *l.* oblong, 1ft. long, 5in. broad; petioles 6in. long. Stems 3ft. to 6ft. high. Colombia, 1894.

S. Wallisii is the correct name of *S. pompayanense.*

STENOTAPHRUM. According to the latest authorities, *S. glabrum* is the correct name of *S. americanum.*

STEPHANANDRA. This genus now embraces four species, natives of China and Japan, and closely allied to *Neillia.* Flowers small, racemose or paniculate, slenderly pedicellate. Leaves alternate, petiolate, incised, or pinnatifid and incised-serrated, pubescent beneath. To the species described on p. 498, Vol. III., the following should be added:

S. incisa (incised). A synonym of *S. flexuosa.*

S. Tanakæ (Tanaka's). *fl.* white, very small, puberulous; in terminal, pendulous panicles 3in. to 4in. long. June. *l.* 2in. long and broad, alternate, triangular-ovate, three-lobed, bright green, turning golden-yellow in autumn; lobes acuminate, serrated. Branches brown. *h.* 5ft. Japan, 1893. (B. M. 7593; R. G. 1896, t. 1431.)

STERCULIA. Including *Oleobachia.* To the species described on p. 500, Vol. III., the following should be added:

S. acuminata (taper-pointed). A synonym of *Cola acuminata.*

S. austro-caledonica (South Caledonian). *fl.* deep red, shaded with orange, numerous, ¼in. in diameter; racemes lateral, springing from the old part of the trunk. *l.* large, palmately lobed, disposed in a terminal crown. *h.* 10ft. or more. New Caledonia. An erect, unbranched, stove tree. (B. M. 7382.) SYN. *S. neocaledonica* (of gardens).

S. Balanghas (of Roxburgh). A synonym of *S. nobilis.*

S. grandiflora (large-flowered). A synonym of *Cola acuminata.*

S. heterophylla (variable-leaved). A synonym of *S. diversifolia.*

S. neocaledonica (New Caledonian). A garden synonym of *S. austro-caledonica.*

S. nobilis (noble). *fl.* pale buff, red within, fragrant, mostly males, ¼in. across, campanulate; panicles lax, axillary, many-flowered, pendulous. *fr.* containing edible seeds. *l.* 2in. to 12in. long, 2in. to 6in. broad, glabrous, oblong, acuminate; petioles 1in. long. *h.* 20ft. India, 1787. SYN. *S. Balanghas* (of Roxburgh).

S. urens (stinging). *fl.* yellow, small, the females mixed with many males; panicles erect, dense, terminal, many-flowered, glandular-pubescent. *fr.*, follicles armed with stinging hairs. *l.* about the ends of the branches, 9in. to 12in. long and broad, rounded, five-lobed, cordate at base; petioles 6in. to 9in. long. Trunk erect. India, 1793. A soft-wooded tree.

STEREOSPERMUM (from *stereos*, rigid, and *sperma*, seed). ORD. *Bignoniaceæ.* A genus embracing about ten species of stove trees, natives of tropical Asia and Africa, and formerly classed under *Bignonia.* Several of them have been introduced, but it is doubtful if they are still in cultivation.

STEREUM FRUSTULOSUM. *See* **Oak Fungi,** Vol. V.

STEREUM HIRSUTUM. *See* **Oak Fungi,** Vol. V.

STERNBERGIA. These beautiful bulbous plants should be left in the soil, which should be deep and light; cover them with litter in severe weather. To the species and varieties described on p. 501, Vol. III., the following should be added:

S. Fischeriana (Fischer's).* *fl.* bright yellow; tube funnel-shaped, less than ¼in. long; segments oblong-spathulate, 1½in. long; peduncles two or three to a bulb, short, one-flowered; spathes white, usually bifid. March. *l.* eight or nine to a bulb, contemporary with the flowers, linear, obtuse, 6in. long at the flowering season, afterwards lengthening. Bulb 1½in. to 2in. in diameter. Caucasus, &c., 1894. (B. M. 7441.)

S. macrantha (large-flowered).* *fl.* bright yellow; tube cylindrical, 2in. long; segments oblong, 1in. to 1¼in. long; peduncle cylindrical, 4in. to 6in. long; spathe 3in. to 4in. long. Autumn. *l.* lorate, obtuse, glaucescent, ¾in. broad, fully developed in June. Bulb 1in. to 1½in. in diameter, the neck 4in. to 6in. long. Asia Minor, &c., 1896. (B. M. 7459.)

STEUDNERA. *S. discolor* is now classed as a distinct species and not as a form of *S. colocasiæfolia.*

STEVIA. To the species described on p. 502, Vol. III., the following should be added. *S. fascicularis* and *S. ivæfolia* are now regarded as distinct species.

S. fascicularis (fascicled). *fl.-heads* white, fasciculately congested; florets glabrous. September. *l.* opposite, rhomboid-lanceolate, deeply and argutely serrated; upper ones sessile. Mexico, 1830. Greenhouse. (B. R. 1838, t. 59.)

Stevia—*continued.*

S. ivæfolia (Ivy-leaved). *fl.-heads* white, disposed in fastigiate corymbs; involucre and florets glandular and downy. August. *l.* lanceolate, attenuated to the petioles, serrated at apex. Stems erect, villous-hairy, corymbosely branched at apex. *h.* 2ft. Mexico, 1816. Greenhouse.

S. odorata (scented). *fl.-heads* white, odorous, disposed in terminal, corymbose cymes. August. *l.* narrow-lanceolate, acuminate. *h.* about 16in. Habitat not recorded, 1890. A free-flowering, greenhouse species.

S. salicifolia (Willow-leaved). *fl.-heads* white, disposed in spreading corymbs. June to September. *l.* opposite, narrow-lanceolate, very shortly petiolate and almost connate, nearly or quite entire. *h.* 1½ft. Mexico, 1803. A glabrous, greenhouse shrub.

STINGING NETTLES. *See* **Urtica.**

STINK FLY. A popular name for the beautiful and distinct **Lacewing Flies** (which *see*).

STINKING CEDAR. *See* **Torreya taxifolia.**

STINKING YEW. *See* **Torreya.**

STINKWOOD, TASMANIAN. *See* **Zieria Smithii.**

STIPA. To the species described on pp. 503-4, Vol. III., the following should be added:

S. arundinacea (Arundo-like). *fl.* purplish-brown, disposed in drooping plumes about 4ft. long, which when dry form excellent "everlastings." *h.* 2ft. New Zealand, 1882. SYN. *Apera arundinacea* (G. C. 1897, xxii., pp. 282-3, f. 84).

S. Calamagrostis (Calamagrostis). The correct name of *S. Lasiagrostis.*

S. capillata (long-haired). *fl.* in a loosely-branched panicle, the branches very slender, erect, elongated; glumes cuspidate-attenuated. *l.* glaucous, rigid, convolute, slender. Culms erect, rigid, leafy throughout. *h.* 2ft. Orient, &c., 1815. A useful species.

STISSERA. A synonym of **Curcuma** (which *see*).

STOKING. This is a most important operation in the heating of glass structures, mushroom-houses, and similar places. In the first place, the stoker should be guided by the external conditions, as, for instance, early in the morning, if the day promises to be bright and warm, it would not only be a waste of fuel and labour to put on a strong fire, and thus heat the hot-water pipes unduly; but the combination of strong heat from the pipes and from the sun is injurious, predisposing the plants to an attack of Red Spider and other animal foes. On the other hand, when the morning is dull and cold, with a disagreeable wind, it would be unwise not to keep up a good fire to maintain the necessary heat in all the houses. Hence the necessity for the stoker exercising a very careful watch on atmospheric conditions and changes, and promptly acting in a sensible manner to avoid waste of labour and fuel, as well as to ensure the best conditions for the plant-life in the heated structures. Another important item in Stoking is perfect cleanliness in the stoke-hole and round the boiler, otherwise considerable loss will occur. All ashes and clinkers should be removed before there is any possible danger of their interfering with the draught of the fire, or mixing with the fuel. Nothing indicates carelessness and a want of method more than to see clinkers and ashes mixing with the coal or treading under foot in the stoke-hole. Many boilers have the fire playing over the outer surface, and soot quickly accumulates. Being practically a non-conductor, it prevents the flames from having the same heating power as when the boiler is kept clear. This waste is avoided if the boiler is regularly cleared of soot once a week through the doors placed for that purpose on all boilers requiring such attention.

Much depends, again, on how the Stoking is performed. One stoker will obtain nearly double the heat from the same weight of fuel in the same boiler as will another. To ensure the greatest amount of heat from fuel it is essential that the bars on which the fire rests should be kept free from clinkers or other matter that interferes with the draught of the fire, and any ashes in the fire removed by raking between the bars from underneath with the long-handled hooked poker. This is much better than continually stirring up the fire, turning it over and over, and wasting a lot of heat in the process. It is necessary to use the poker occasionally, but after clearing away all clinkers the first thing in the morning, and

Stoking—*continued.*

again at night before banking-up, the less the fire is interfered with, the better. In fact, with that excellent fuel, anthracite coal, it is most unwise to turn the fire over unnecessarily, as it will go black and be a long time in becoming bright again. During very cold weather, when the fires must be kept going continuously to maintain a proper temperature, the stoker will secure the greatest heat by getting a big fire, and replenishing it frequently with a small amount of fuel, thus always keeping a bright, hot fire playing on the boiler. If the fire is permitted to burn low, and is then heavily charged again with fuel, it is astonishing how quickly the hot-water pipes cool while the fire is burning up. Again, it is always advisable to have the body of the fire as near to the furnace-door as possible, so that the fire may travel over the whole of the boiler. When far back in the furnace, much of the heat is lost, as the front part of the boiler is scarcely touched by the fire.

Indirectly connected with Stoking is the feeding of the boiler. In many gardens the supply-cistern is filled by hand, and not by a ball-tap, and it is important that the water is never allowed to become low; not only is it dangerous, but when there is a large, fierce fire, the sudden addition of a mass of cold water to a heated boiler is very liable to cause it to crack, and thus become useless at a time when it is most needed.

STOPPING. The operation of Stopping, or pinching back, the growth of fruit trees and plants in pots is a very important one, and requires both care and judgment; but no hard-and-fast rule can be laid down. The Grape Vine usually has its laterals stopped one or two leaves beyond the bunch; but if there is space for further extension of the lateral growth, it is advisable to allow three or four leaves to be made before Stopping. In training trees in fancy forms, shoots may be made to appear almost anywhere they are desired by judicious Stopping; and plants that would otherwise be tall and leggy are made bushy and compact by timely Stopping. With trained fruit trees there is a danger of doing more harm than good by summer Stopping of the shoots. If done too early, a mass of young wood is produced, thus forming congested spurs and unripened wood with little fruit.

STOVE. For maintaining the proper atmospheric temperature hot-water pipes may be laid under the paths, with iron gratings above to allow the heat to pass readily through; or they may be arranged up the side walls or above the staging. The side walls of the house about 3ft. from the ground level should be glazed so as to make the structure as light as possible, as for several months of the year all the light that it is possible to obtain will be necessary for the proper development of the plants growing inside.

Where only one house is used as a Stove, it should be divided across the middle by a glazed partition. The two divisions may then (at certain seasons of the year) be kept at slightly different temperatures, and the atmosphere of one may be kept drier to ripen the wood and also to allow that period of rest which is so necessary to a large number of plants.

Good loam is essential, and this should be the top spit from a pasture, with plenty of fibrous roots in it. It should be stacked for several months before it is required for use in a good-sized heap, with the grassy side downwards.

Good fibrous, turfy peat, of a sandy nature, is another requisite, and when used should be broken into lumps with the hands. For some plants, such as Anthuriums, it is desirable to remove a quantity of the fine matter. This may be done by slightly beating the broken lumps with a stick.

Leaf-mould, when obtained by collecting the leaves of Oak, Beech, Elm, &c. (avoiding those of a poisonous nature, such as Laurels), putting them in a large heap and occasionally turning it over to sweeten it, is very useful for many plants. It is highly important that it is sweet and free from fungus.

Cow-dung, when well decayed, is a very safe manure to use for plants that require a little stimulant.

Coarse silver-sand is extensively used for striking

Stove—*continued.*

cuttings and for mixing in composts to keep them sweet and porous.

Charcoal, in lumps, is another useful material for mixing in the soil to keep it open, and for the roots of plants to cling to.

Live sphagnum should have all the grass, leaves, and refuse picked out before using.

Cocoa-nut refuse is a clean and suitable material for hot-beds, and for plunging plants that require bottom-heat (if hot-water pipes are supplied to provide the necessary heat).

Artificial manures are offered in abundance. Many of them are of good quality, and are of great benefit if used judiciously.

Stove plants should be encouraged to make most of their growth during the spring and summer months, when there is plenty of sunlight to develop it. They should be repotted in the spring, just as they are commencing to grow, and the heat and moisture in the house increased. In repotting, clean, dry pots, with efficient drainage, should be used, and soil in a proper state as regards moisture, and sufficiently warmed to prevent chilling of the roots. In ventilating, cold draughts must be avoided, and the ventilators be closed as early in the afternoon as is consistent with safety to economise the sun heat, which will be found to be more beneficial to the plants than an indiscriminate use of fire-heat.

The water used both for watering the soil and for syringing overhead should be of about the same temperature as that of the house. In watering give sufficient to wet the whole ball of earth quite through, but be careful not to apply any water unless required, or the soil will become sodden and sour. Clean rain-water is much the best when it can be obtained in sufficient quantity. If well-water is used it should be exposed to the air for some time beforehand.

During the bright days of spring and summer most plants require a little protection from bright sunshine. For this purpose a material called "hothouse shading" is made into blinds, and fixed to rollers to cover the roof. Care should be taken to draw up the blinds when the weather becomes cloudy, to prevent the plants from becoming drawn and weak.

In the following genera may be found the chief decorative subjects for the Stove, exclusive of **Ferns,** an enumeration of which appear under that heading.

Flowering Plants.

Achimenes
Æchmea
Ærides
Æschynanthus
Agalmyla
Allamanda
Amasonia
Angræcum
Anhalonium
Anœctochilus
Anthurium
Aphelandra
Arachnanthe
Ardisia
Ataccia (Tacca)
Begonia
Bollea
Bulbophyllum
Burbidgea
Burchellia
Calanthe
Centropogon
Cereus
Clerodendron
Clivia
Crinum
Dendrobium
Dendrochilum (Platyclinis)
Diacrium (Epidendrum)
Didymocarpus
Echinocactus
Epidendrum
Epiphyllum
Eucharis
Eupatorium
Euphorbia
Franciscea (Brunfelsia)
Gardenia
Gesnera
Gloneria (Psychotria)
Gloxinias
Goldfussia
Goodyera
Grammatophyllum
Hedychium
Heliamphora
Hibiscus
Hippeastrum
Imantophyllum (Clivia)
Impatiens
Ixora
Justicia
Lasiandra
Leuchtenbergia
Libonia
Linum
Luculia
Magnolia
Mammillaria
Medinella
Melocactus
Miltonia
Monochætum
Mussænda
Nægelia
Oncidium
Opuntia
Pancratium
Paphinia
Pelecyphora
Pentas
Pereskia
Peristeria
Pescatorea
Phaius
Phalænopsis
Phyllocactus
Pilea
Pilocereus
Platyclinis
Plumbago
Poinsettia (Euphorbia)
Posoqueria
Promenæa
Reinwardtia
Renanthera
Rhipsalis
Rhododendron
Rivina
Rondeletia
Russelia
Saccolabium
Saintpaulia
Scutellaria
Sericographis (Jacobinia)
Strelitzia
Tabernæmontana
Thyrsacanthus
Tillandsia
Torenia
Toxicophlæa
Tydæas
Urceolina
Vanda
Vinca
Vriesia
Warscewiczella

Stove—*continued.*

Ornamental Foliage Plants.

Acalypha	*Cyperus*	*Panax*
Alocasia	*Dichorisandra*	*Pandanus*
Ananassa	*Dieffenbachia*	*Panicum*
Andropogon	*Dracæna*	*Pavetta*
Anthurium	*Eranthemum*	*Peperomia*
Aphelandra	*Eriocnema*	*Phrynium*
Aralia	*Erythrina*	*Phyllanthus*
Asparagus	*Ficus*	*Phyllotænium*
Begonia	*Fittonia*	*Rhopala*
Bertolonia	*Heliconia*	*Roupala*
Brexia	*Isolepis*	*Sanchezia*
Brownea	*Jacaranda*	*Sonerilla*
Caladium	*Leea*	*Sphærogyne*
Campylobotrys	*Maranta*	*Strobilanthes*
(Hoffmannia)	*Mimosa*	*Tillandsia*
Cossignia	*Musa*	*Tradescantia*
Croton	*Nepenthes*	*Zebrina*
Curculigo	*Nidularium*	*Zingiber*
Cyanophyllum	*Oplismenus*	

Climbers. Wall and Pillar Plants.

Allamanda	*Gloriosa*	*Paullinia*
Aristolochia	*Hoya*	*Pellionia*
Bignonia	*Ipomæa*	*Pothos*
Bougainvillea	*Jasminum*	*Schubertia*
Cissus	*Manettia*	*Solanum*
Clerodendron	*Maregravia*	*Stephanotis*
Combretum	*Oxera*	*Tecoma*
Dipladenia	*Passiflora*	*Thunbergia*
Ficus		

STRAIN. A term used by seedsmen for some particular or celebrated variety that has been raised in a special manner.

STRANVÆSIA. This genus now embraces four species, natives of China, Thibet, and the Himalayan region.

STRATIFICATION. By this method seeds which quickly lose their germinative properties may be preserved. The direct action of air has a very detrimental effect on seeds, and those requiring protection are mostly stratified as soon as they are collected. The simplest way to do this is to take a receptacle of any sort possessing some outlets to prevent any stagnation, and of a size suitable to the quantity of seeds to be preserved. On the bottom of it should be laid a thin bed of breeze (small pieces of unburnt coke), and this should be covered with one of sand, on which the seeds should be deposited as closely as possible. Another layer of sand should now be added, then more seeds, and so on until the pan is filled, when the whole must be covered with more breeze to keep away worms. It is advisable to stand the receptacle in the coolest place. As cellars are too warm in winter, a good plan would be to bury it underground at a sufficient depth to avoid frost. The soil placed on the top must be arranged in such a way as to form a kind of cone to keep off the water; and this especially applies to tree and vegetable seeds. Stratification is also useful for tropical and sub-tropical seeds, which would otherwise lose their germinative properties before their arrival here. Cocoa- and Coffee-tree seeds must be stratified as soon as collected.

STRAVADIUM INSIGNE. A synonym of **Barringtonia samoensis** (which *see*).

STRAWBERRY. The method of growing Strawberries in barrels has been recommended as a means of obtaining a large quantity of fine fruit from a small area. For those who have a very limited garden the plan possesses some advantages; but for the ordinary cultivator the barrel has yet to be proved an advantage or superior to the usual practices. The size of barrel most frequently used is that known as a 36-gallon. The top is removed, and the bottom perforated with drainage-holes. The

Strawberry—*continued.*

sides of the barrels are also perforated with holes about 3in. in diameter, there being 100 holes or so in a barrel of the size named. After putting drainage in the barrel, it is filled with good fibrous loam, and a little well-decayed manure added, having a 3in. drain pipe, or a coil of fine wire-netting filled with moss down the centre of the barrel from top to bottom, which acts for drainage and keeps the soil sweet by admitting air down the centre.

Strong Strawberry-runners are planted early in August in the holes round the barrel, and also on the top, and the young plants carefully watered and syringed to encourage growth. The following season the plants fruit, and, if the barrel is raised a foot or so from the ground, the fruit hanging down is free from grit, and perfectly clean. The greatest objection to this mode of growing Strawberries is the weight of the barrel, and the difficulty of moving it from one place to another or turning it round so that the sun may shine on all sides. A revolving apparatus was made for placing the barrels on, but the cost was too great for it to be used generally.

FORCING IN POTS. In addition to the information given under this head in Vol. III., we add a few remarks on the importance of the proper development and cleanliness of the foliage. Many are under the impression that plants will fruit as well when deprived of their foliage as when this is retained. Experiments, however, have proved that though the blossoms will set they absolutely refuse to develop fruit of a useful size, none attaining the size of an ordinary marble or a Hazel-nut. This is due to the want of nourishment supplied through the leaves, and the leaves being absent no plant-food supplied to the roots can be assimilated; in fact, manures supplied under such conditions do infinitely more harm than good.

In Fig. 703, showing a plant with bold, handsome foliage and blossoms appearing above, we have the proper growth and balance between the roots and tops, in which both

FIG. 703. FORCED STRAWBERRY PLANT IN FLOWER.

Strawberry—*continued.*

work together for the production of good fruit. The healthy foliage quickly absorbs and assimilates the plant-food supplied by the grower, and is followed by excellent crops of fruit, as shown in Fig. 704, bearing ripe berries.

FIG. 704. FORCED STRAWBERRIES IN FRUIT.

Next in importance to having good foliage is the keeping of the leaves clean and free from insect pests, otherwise they may be entirely destroyed by these foes. If Red Spider appears, fumigation with one of the vaporising insecticides is necessary; but if the foliage is well syringed daily, except when the plants are in blossom, and when bearing ripe fruit, few insect enemies will put in an appearance. When the fruit is swelling freely, 2oz. of muriate of potash in 1 gallon of water will assist the berries considerably if applied once a week, but this stimulant should cease when the fruit commences to colour.

INSECTS, &c. Strawberries outside are attacked by two or three species of voracious Ground-Beetles, which, forsaking for a time their carnivorous diet, feast upon the ripening fruit. *Harpalus ruficornis*, a very common Beetle, is one that is found in enormous numbers in Strawberry-beds, the mulching usually provided affording it a safe harbourage in the daytime. It feeds at night. The insect is about ½in. long, flattish, and dark as to colour. Indeed, the head and thorax are quite black, and the only relief to its general sombre colouring are the red legs, antennæ, and the down upon its wing-cases. The larval state is passed beneath the soil. This insect is winged, contrary to what is usual in the Ground-Beetles found in this country.

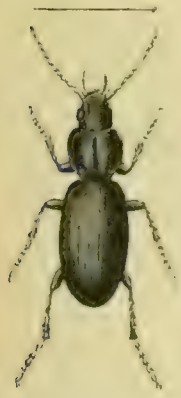


FIG. 705. PTEROSTICHUS MADIDUS.

Pterostichus (*Steropus*) *madidus* (Fig. 705) is even commoner than the *Harpalus*, and is altogether a larger insect, reaching ⅔in. long. It is shiny black, ovate, convex, with a distinct furrow in the back, and much streaked. The legs of this insect are sometimes red. The Beetle is very common in gardens, and is wingless. Equally common is *Calathus cisteloides*, another wingless insect, but swift of foot. It is black, approaches ½in. in length, and is very fond of sheltering beneath stones and fallen leaves. The above, with perhaps *Zabrus gibbus* and a few of the Sunshiners (*Amara*), are the exceptions in the family *Carabidæ* to those feeding exclusively upon flesh.

Strawberry—*continued.*

In the case of a small garden, the Beetles may be hand-picked by dislodging them from their hiding-places during the day; but where there are acres of the fruit under cultivation something less laborious would necessarily have to be adopted. The paste known as the Magic, if properly distributed, soon thins them down; or Ramsden's Beetle Paste may be employed. Messrs. Laxton Bros., the Strawberry specialists, of Bedford, have devised a very ingenious way of dealing with these destructive Ground-Beetles. Their plan is to sink all over their fields common basins, baited with tempting morsels. The Beetles make their way into the basins, but are unable to get out of them. The method is fully described in their "Strawberry Manual."

A well-known pest is a species of Nematoid Worm, *Aphelencus fragariæ*. This is very difficult to deal with, owing to its method of feeding beneath the soil. So far its ravages have been best met by the introduction of certain artificials, which, while doing good to the crop, render the quarters uncomfortable.

FUNGI. Many of the fungi affecting Strawberries were briefly mentioned in Vol. III. Some of these now require more extended notice, as they have since proved serious pests.

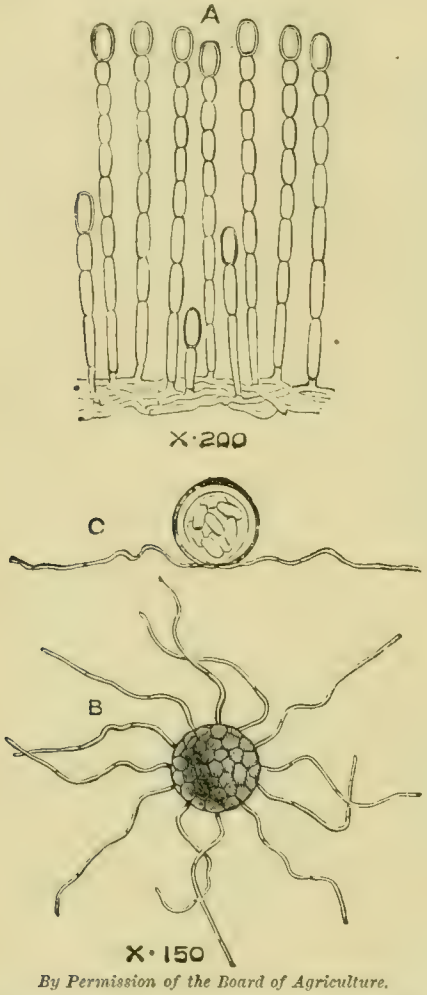
Strawberry Mildew (*Sphærotheca humuli*) is a most injurious disease against which the cultivator has to do battle. At one time it was thought that it was identical with the Rose Mildew (*Sphærotheca pannosa*), but further investigations have shown that it differs from that well-known pest, the chief point of difference lying in the shape of the conidia and in their size. The disease is not by any means of recent discovery, Berkeley, the pioneer of plant-diseases due to fungi, having described it more than forty years ago in the "Gardeners' Chronicle." Nor is it confined to the Strawberry, as its specific name suggests, the hop-grower having suffered severely from its ravages. Moreover, it is found upon many common British plants, and therefore its presence in gardens causes little surprise. Until comparatively recent years, however, it has not proved very troublesome to Strawberries in this country, though in America it has been regarded for a long time as a formidable pest, being known there as *S. castagnei*.

Leaves and fruits are alike affected, and, as in the case of its near ally, the Rose Mildew, there is considerable curling of the foliage at the margin. Later the fruits are attacked, though it is not usually until the crop is practically ready for market that its effects are visible to the naked eye. The berries attacked are rendered unmarketable. To the grower the first symptoms of attack are noticeable in late spring, the foliage curling in the way suggested, and afterwards the white mycelium is noticeable, especially on the under-surfaces. Quickly conidiophores (Fig. 706) with conidia are produced, and the latter are scattered broadcast by various agencies, increasing the area of infection and giving to the foliage a powdery appearance that cannot be mistaken. The berries also participate. Towards the end of the season, another form of fruit is produced upon the leaf-stalks, known as perithecia (Fig. 706). These cases, as they may be termed, contain spores which, little affected by winter's cold or damp, remain undeveloped until the spring, when they are set free and the cycle is commenced anew. The perithecia remain sometimes upon the plants, and at others in the soil in their vicinity. So far no disease-resisting variety has yet been produced; but perhaps this will be forthcoming in the future. Some varieties, however, appear to be more susceptible than others, those containing Black Prince blood for instance.

Once the disease has attacked the fruits, nothing can be done. The time to spray is directly the leaves are observed to be infested in spring. Sulphide of potassium in the case of this and similar Mildews has given excellent

Strawberry—*continued.*

results. Several sprayings should take place at intervals of about ten days.



By Permission of the Board of Agriculture.

FIG. 706. STRAWBERRY MILDEW (*Sphærotheca humuli*), showing A, Conidiophores; B, Perithecium; and C, Section of Ascus, showing the spores.

To the varieties on pp. 512-3, Vol. III., the following may be added:

Acquisition. Fruit very large, pale red; flesh soft and of fair flavour. An immense bearer.

Auguste Boisselot. Fruit dark red; flesh red, melting, and of delicious flavour. Hardy and prolific.

Countess. Fruit large, dark crimson, with deep red melting flesh, of exquisite flavour. A splendid variety on warm soils, and very prolific.

Edouard Lefort. Fruit medium to large, bright red; flesh red, melting, with a delicious aromatic flavour. A French variety of great merit. Hardy, and a moderate bearer.

Empress of India. Fruit medium to large, bright scarlet; flesh red and very fine flavour. Valuable for forcing or outdoor culture.

Gunton Park. Fruit large, deep crimson-scarlet; flesh firm, rich, and briskly flavoured. A new and promising variety.

Leader. Fruit very large, deep scarlet, with flesh of the same colour, of fairly good flavour. A great bearer, hardy and compact.

Mentmore. Fruit large, very dark red. A new variety raised by Messrs. Laxton, of fine flavour, and promises to be a good mid-season variety.

Strawberry—*continued.*

Monarch. Fruit very large, deep crimson; flesh white, firm, and of very good quality. A new variety; hardy and prolific.

Royal Sovereign. Fruit large, bright scarlet; flesh pale, firm, and briskly flavoured. A variety of great merit. A wonderful cropper, hardy, and also very early. Fine for either forcing or outside culture.

Veitch's Perfection. Fruit very large, dark crimson; flesh very rich and of the finest flavour. A new late variety raised from a cross between British Queen and Waterloo, and promises to be a valuable introduction.

Waterloo. Fruit very large, dark claret-colour; flesh deep crimson, juicy, and of agreeable flavour. Valuable for its lateness, and as a rule produces the heaviest crop on two-year-old plants.

STRAWBERRY LEAF-SPOT (*Sphærella fragariæ*). The common name gives a clue to the chief characteristic of the disease—the spots on the foliage. These occur on the upper surface, and increase in size and colour as the different stages are reached; usually they coalesce. They are at first dark purplish; then the central portion lightens until it is nearly white, and the blotches by this time are of large size, and practically the whole leaf-surface is discoloured. When this is the case, the foliage is shed, and in very bad cases the plants die. In America the somewhat heroic treatment of mowing the plantation after the crop has been gathered, and then firing the tops by the aid of straw, is adopted; but the remedy when suggested here was regarded as worse than the disease. There seems, however, to be little doubt as to its efficacy, and it is well worthy of a trial, followed the next season by spraying with Bordeaux Mixture. In America the disease is called the Strawberry Leaf-Blight, and those who would like to go farther into its life-history should read Prof. Scribner's article in the Report of the United States Department of Agriculture.

STRELITZIA. To the species and varieties described on p. 514, Vol. III., the following should be added:

S. angustifolia (narrow-leaved). A form of *S. parvifolia.*

S. farinosa is a variety of *S. Reginæ.*

S. Nivenii (Niven's). *l.* lanceolate, very narrow. A garden hybrid. 1888.

S. pumila (dwarf). A form of *S. Reginæ.*

S. Reginæ flava (yellow). A variety with citron-yellow sepals. 1887. It is also called *citrina.*

STREPTOCALYX (from *streptos*, twisted, and *calyx*; in allusion to the twisted sepals). ORD. *Bromeliaceæ.* A small genus (eight species) of stove, herbaceous plants, differing from *Æchmea* only in the very contorted sepals and more protruded, scaleless sepals—according to J. G. Baker, scarcely worth separating generically. For culture of the two species known to cultivation, *see* **Æchmea.**

S. Fuerstenbergii. The correct name of *Æchmea Fuerstenbergii.* SYN. *Tillandsia Fuerstenbergii.*

S. Vallerandi (Eugene Vallerand's). *fl.* violet, in a dense, erect, oblong-cylindrical panicle 1ft. to 1½ft. long; branch-bracts as long as the branches, bright red, the lower ones 3in. to 4in. long. *l.* about forty in a dense rosette, ovate and 3in. to 4in. broad at base, the blade 3ft. to 4ft. long and 1½in. broad, the marginal prickles small and close. Amazon Valley, 1876. (B. H. 1883, p. 13, t. 1-2.) SYN. *Lamprococcus Vallerandi* (R. H. 1887, p. 129).

STREPTOCARPUS. All the plants comprised in this genus will thrive under greenhouse treatment. To those described on p. 516, Vol. III., the following should be added:

S. biflorus (two-flowered). A synonym of *S. Gardenii.*

S. Galpini (E. E. Galpin's).* *fl.* rich mauve, with a conspicuous white eye, campanulate, nearly 1½in. across; corolla lobes five, spreading-recurved. October. *l.* solitary, radical, sessile, ovate-oblong, obtuse, entire, sub-cordate at base, silky-villous above, tumid between the nerves, flesh-coloured and red-nerved beneath. Transvaal, 1890. (B. M. 7230.)

S. luteus (yellow).* The correct name of the plant figured in B. M. 6636, and described on p. 516, Vol. III., as *S. parviflora.*

S. multiflora (many-flowered). A garden variety of *S. Rexii.*

S. parviflorus (small-flowered).* *fl.* pale blue or purplish; calyx somewhat five-parted; corolla tube about ⅜in. long; pedicels twin, distant; peduncles three- to ten-flowered. *l.* dense, ovate or oblong, narrowed at base, sub-sessile, 7in. long, crenate, softly villous, woolly beneath. South Africa. (B. M. 7036.)

S. Rexii multiflora (many-flowered). A garden seedling, having larger and brighter-coloured flowers than in the type. 1895.

Streptocarpus—*continued.*

S. Wendlandii (Wendland's).* This very fine species resembles *S. Dunnii* in regard to size and form of flower, but it is of clear blue colour. Natal, 1890. (B. M. 7447.)

Hybrids. The following are good:

ACHIMINEFLORUS (*S. polyanthus* and Veitch's Hybrids); ACHIMINEFLORUS ALBUS, white, large flowers; ACHIMINEFLORUS GIGANTEUS, lavender-blue, large; BRUANTI (*S. polyanthus* and *S. Rexii*); DISTINCTION; DYERI (*S. Dunnii* and *S. Wendlandii*); GRATUS (*S. Dunnii* and Veitch's Hybrids); KEWENSIS (*S. Dunnii* and *S. Rexii*); LICHTENSTEINENSIS (*S. Wendlandii* and *S. Watsoni*); MRS. HEAL (*S. Wendlandii* and Veitch's Hybrids); PULCHELLUS (*S. Fanninii* and Veitch's Hybrids); SYLPH (*S. Wendlandii* and Veitch's Hybrids); WATSONI (*S. Dunnii* and *S. parviflora*); and WHITE LADY (see Fig. 707).

FIG. 707. STREPTOCARPUS WHITE LADY.

STREPTOPUS. *S. distortus* is the correct name of the plant described as *S. amplexicaulis* (which name should be *amplexifolius*).

STREPTOSTIGMA. A synonym of **Cacabus** (which *see*).

STRICKLANDIA (named in honour of Sir C. W. Strickland). ORD. *Amaryllideæ*. A monotypic genus, differing from *Phædranassa* in having monadelphous filaments. The species, *S. eucrosioides*, is described on p. 89, Vol. III., as *Phædranassa eucrosioides*, and was also formerly known as *Leperiza eucrosioides* and *Stenomesson Stricklandi*.

STRIKE. To take root; commonly said of cuttings.

STRIKING. The process of propagating by means of cuttings is termed Striking, and when the cuttings have emitted roots they are stated to have "struck."

STRIPED KING OF THE WOODS. *See* **Zeuzine regium.**

STROBILANTHES. To the species described on pp. 516-7, Vol. III., the following should be added:

S. alatus (winged).* *fl.* violet-blue, marked with a yellow spot in the throat, disposed in loose panicles; corolla 1¼in. long; peduncles axillary or terminal, trifid, hairy. *l.* cordate, serrated, caudate-acuminate, more or less hairy, 5in. long, 2½in. broad, dark green; petioles 1in. to 4in. long, linear or

Strobilanthes—*continued.*

winged upwards. Stem quadrangular, more or less hairy. *h.* 2ft. to 4ft. Temperate Himalayas, 1836. A handsome, greenhouse shrub. SYN. *S. attenuatus* (R. G., t. 1243).

S. attenuatus (narrowed). A synonym of *S. alatus*.

S. callosus (hardened). *fl.* pale violet-blue; corolla 1½in. long, very hairy within; spikes 1in. to 4in. long, often densely or laxly cymose. *l.* elliptic, acuminate at both ends, 6in. to 9in. long, crenate, conspicuously lined and hairy above. Branches often warted or tuberculed. *h.* 6ft. East Indies, 1897. (B. M. 7538.)

S. coloratus (coloured). *fl.* pale bluish-purple, 1½in. long, shortly pedicellate; sepals erect, linear, ½in. long; corolla with a ventricose tube and short, rounded lobes; panicles 6in. to 12in. high, widely spreading and profusely branched January. *l.* 5in. to 7in. long, ovate or elliptic, acuminate or produced into a long tail, serrated, dark green above, reddish-purple beneath. *h.* 3ft. to 6ft. Khasya, 1886. (B. M. 6922.)

S. Dyerianus (Dyer's).* *fl.* violet-blue, disposed in erect spikes; corolla 1in. long, funnel-shaped. *l.* opposite, ovate, acuminate, marked, especially when young, with rich rosy-purple on a dark green ground. East Indies, 1893. A magnificent, free-growing species. (B. M. 7574; J. H. xxvi., p. 359, f. 66.)

S. flaccidifolius (flaccid-leaved).* *fl.* lilac-purple, in loose, leafy, paniculate spikes; tube of the corolla bent, the lobes deeply notched. *l.* 2in. to 4in. long, elliptic-lanceolate, acute, narrowed to the petioles, serrated, glabrous, bright green. India, China, 1837. A pretty shrub, yielding a blue dye called "Room." (B. M. 6947.)

STROMANTHE. Including *Kerchovea*. *S. Lubbersiana* is now regarded as a species of *Myrosma* (*M. Lubbersii*), *S. spectabilis* is a form of *S. sanguinea*, and *S. Tonckat* is the correct name of *Maranta angustifolia*.

STROPHANTHUS. Many of the plants of this genus possess quaintly-coloured flowers, which are rendered still more curious by the long, tail-like expansions of the corolla lobes. *S. dichotomus* is shown at Fig. 708.

S. Ledienii (Ledien's). *fl.* borne in umbels terminating the woody branches; corolla buff-yellow, star-shaped, five-lobed, each lobe prolonged into a very long, narrow, ribbon-like tail; corona and stamens violet, with five white rays. *l.* nearly sessile, obovate, suddenly drawn out into a short point, the margins entire, both surfaces softly hairy. Congo, 1887. Stove shrub. (R. G., t. 1241.)

S. Petersianus grandiflorus (Peters', large-flowered). *fl.* solitary, few in a terminal cyme; corolla tube over 1in. long and broad, dull yellow, streaked with red, the lobes reflexed, with loosely-twisted, pendulous tails 3in. long, yellow within, dull red outside. May. *l.* 3in. to 5in. long, ovate, obtusely acuminate, undulated, pale beneath. Delagoa Bay, 1884. A slender, glabrous, stove climber. (B. M. 7390.)

STRYCHNODAPHNE. Included under **Ocotea** (which *see*).

STRYPHNODENDRON (from *stryphnos*, rough, astringent, and *dendron*, a tree). ORD. *Leguminosæ*. A small genus (five or six species) of stove, unarmed, usually small, tropical American trees, closely allied to *Piptadenia* and *Adenanthera*. Flowers small, uniform, hermaphrodite or sub-polygamous, in cylindrical spikes. Leaves bipinnate; leaflets small. Only one species has been introduced—*S. guianensis* (SYNS. *Acacia*, *Mimosa*, and *Piptadenia guianensis*)—and that is not in general cultivation.

STUARTIA. According to the "Index Kewensis," *S. Malachodendron* is the correct name of the plant described on p. 521, Vol. III., as *S. virginica*; but the Kew Hand-list of trees and shrubs keeps up the latter name.

STYLIDIUM. To the species described on pp. 520-1, Vol. III., the following should be added:

S. crassifolium (thick-leaved). *fl.* pink, four-lobed, ¾in. in diameter; scape 2ft. high, hairy, with numerous short branches. *l.* 4in. to 8in. long, fleshy, linear. South-west Australia, before 1899. A tall, rigid, erect, nearly glabrous, greenhouse herb. (B. M. 7679.)

STYLOPHAGA. *See* **Cockroaches.**

STYLOPHORUM DIPHYLLUM. *Meconopsis diphylla* and *M. petiolata* are synonyms of this species.

STYRAX. According to the "Index Kewensis," *S. japonica* is a distinct species (*see* under **S. serrulata virgata**). To the species described on p. 523, Vol. III., the following should be added:

Styrax—*continued.*

S. Obassia (Obassia).* *fl.* white, fragrant, 1in. to 1¼in. in diameter, numerous, secund, nodding, disposed in racemes 6in. to 8in. long. *fr.* ovoid-oblong, as large as a Hazel-nut. *l.* elliptic or roundish, cuspidate, 3in. to 8in. long and broad, petiolate, denticulate, cano-tomentose beneath, in autumn becoming suffused with yellow and blotched with red. Japan, 1838. Hardy. (B. M. 7039; G. C. 1883, iv., p. 133, f. 14.)

SUB-CLASS. A group of orders next in importance to a Class.

SUB-EROSE. Sŭb-ĕrose means slightly bitten; Sūbĕrose (Suber-like) means Cork-like.

SUB-KINGDOM. The highest sub-division of a Kingdom; *e.g.*, the Phenogams and the Cryptogams of the Vegetable Kingdom.

SUB-SHRUB. *See* **Under-shrub.**

SUBTEND. To embrace in its axil.

SUCCULENT PLANTS. The chief characteristics of Succulent Plants are their great diversity and peculiarity of form, and on this account alone they are worthy of cultivation, for they differ so much in appearance from the general run of plants as to afford a complete change to the eye. But besides being peculiar, many are very ornamental and bear handsome flowers, and as such are worthy of being treated as something more than mere curiosities.

Provided a few essential conditions be observed, there are few plants that are more easily cultivated than Succulents, or that require so little attention. The most important condition is that they should be provided with a house to themselves. There are many plants of this class that may be cultivated with a fair amount of success along with others requiring totally different conditions; but the success so obtained is never equal to what can be done when they are grown alone.

The house should be very light, airy, and well drained. The drainage is very important, as for a great part of the year the house will require to be kept dry, and at no time should water be allowed to remain on the floors. For this reason it is advisable that the flooring of the house be above the level of the surrounding ground; it is also better, if space permit, for a division to be made, one part of the structure to be warm (with a temperature of from 55deg. to 65deg.) and the other cool (from 45deg. to 55deg.), with as much sun-heat in both cases as the plants can get during summer. However, if this plan is not convenient, the majority of Succulents may be grown in a temperature ranging from 50deg. to 60deg. in summer, and this may drop as low as 45deg. in winter.

Succulent Plants—*continued.*

Most of the Succulents inhabit tropical countries and grow in dry, arid regions, where they are baked up for a great part of the year, and during the other portion are subjected to torrential rains interspersed with bright sunshine, together with a very warm atmosphere, and this is especially the case with Cacti. It is during this period that they make their growth and flower. During the remainder of the season they are at rest and are undergoing a ripening process. To secure these conditions as near as possible under artificial treatment, the plants should be started into growth in the spring by giving copious waterings, and also syringing overhead during April, May, and June. Towards the end of the last-named month the supply should be gradually reduced, and but little given during the rest of the season, the plants being allowed to become almost dry; while during the winter, unless any of the plants show signs of shrivelling, none at all is required. By reducing the water-supply early the plants are well ripened and

FIG. 703. STROPHANTHUS DICHOTOMUS.

enabled to pass through our dull, damp winters. Without thorough ripening flowers cannot be obtained. No shade at all is required, but plenty of ventilation should be given during hot weather; and excepting during the growing period the atmosphere of the house should be kept quite dry.

All Succulents should be grown in small pots. Even large plants require very little root-room. The soil should in nearly every case consist of good fibrous loam mixed with plenty of sharp silver-sand, broken bricks, and mortar rubbish; and plenty of drainage should be given.

Repotting is not often necessary; in fact, provided the drainage is good, most of the Succulents will do for several years in the same pot. When necessary, the operation should be performed in the spring, during April and May.

Propagation is very simple, as there are scarcely any other plants that root so easily from cuttings. Many are easily raised from seed, others throw up suckers, and

Succulent Plants—*continued.*

some may be propagated by leaf-cuttings. When propagated by suckers, it is advisable to let the cut portion dry well before inserting it in soil, which should be nearly dry and have plenty of sand mixed with it. *See also* **Cacti.**

SUGEROKIA. A synonym of **Heloniopsis** (which *see*).

SUKANA. A synonym of **Celosia** (which *see*).

SUN-FRUIT. *See* **Heliocarpus.**

SUPER-. The same as **Supra-** (which *see*).

SUPERPHOSPHATES. *See* **Phosphates of Lime,** Vol. III.

SUSUM (from the native name). ORD. *Flagellariæ.* A genus embracing two species of stove, Indian and Malayan perennials, with a stout, erect stem. Flowers diœcious, in broad panicles, sessile. Fruit Pea-like, succulent, one- or two-seeded. *S. anthelminticum*, the only species introduced, is an interesting plant somewhat resembling a *Dracæna*.

S. anthelminticum (worm-expelling). *fl.* reddish-tinted, about ¼in. broad; panicle erect, shortly and stoutly pedunculate, irregularly branched. *l.* 3ft. to 8ft. long, lanceolate, acuminate, coriaceous, many-nerved; petioles 1ft. to 3ft. long, sheathing at base. Stem 3ft. to 5ft. high, stout, leafy at top. Malay Peninsula, &c., 1889. (R. H. 1889, p. 76, f. 23.)

SUTERA. A synonym of **Chænostoma** (which *see*).

SUWARROW NUT. *See* **Caryocar nuciferum.**

SWAINSONA. To the species and varieties described on pp. 527-8, Vol. III., the following should be added:

S. coronillæfolia is now accorded specific rank.

S. c. Osbornii (Osborn's). *fl.* pink, becoming violet with age. 1851. (L. J. F., t. 304.)

S. Ferrandi alba (Ferrand's white). *fl.* yellowish-white in bud; corolla snow-white when fully expanded, with a broad, spreading standard; keel small; wings much reduced. Probably a garden variety of *S. galegifolia*.

SWAMP LAUREL. *See* **Magnolia glauca.**

SWAMP LILY, PERUVIAN. *See* **Zephyranthes candida.**

SWAMP LOCUST-TREE. *See* **Gleditschia monosperma.**

SWAMP POST. *See* **Quercus lyrata.**

SWAMP SASSAFRAS. *See* **Magnolia glauca.**

SWARTZIA. To the species described on p. 528, Vol. III., the following should be added:

S. apetala (without petals). *fl.*, spike twenty- to thirty-flowered. *l.* pinnate; leaflets lanceolate-ovate, acuminate, glabrous. Brazil.

S. Langsdorfii (Langsdorf's). *fl.* white, five or six in a raceme. *l.* pinnate; leaflets ovate, acute, reticulate-veined, glabrous; petioles marginate. Brazil.

SWEDISH BEAM-TREE. *See* **Pyrus intermedia.**

SWEEPING. In the hands of a good workman the besom is the best appliance for cleaning up fallen leaves on lawns or walks. The worker should always sweep in the same direction as the wind is blowing.

SWEET MARJORAM. *See* **Origanum Majorana.**

SWEET MAUDLIN. *See* **Achillea Ageratum.**

SWEET PEA (*Lathyrus odoratus*). Full cultural details and a list of varieties are given under **Lathyrus,** in this Volume.

SWEET PISHAMIN. *See* **Carpodinus.**

SWEETIA (of De Candolle). Included under **Galactia** (which *see*).

SWIETENIA CHLOROXYLON. A synonym of **Chloroxylon Swietenia** (which *see*).

SWORD FERN. A common name for *Xiphopteris*, now included under **Polypodium** (which *see*).

SYAMA. A synonym of **Pupalia** (which *see*).

SYLVA, or **SILVA.** The trees of any particular country or region.

SYMMETRIA. A synonym of **Carallia** (which *see*).

SYMPHONIA GLOBULIFERA. A garden synonym of **Moronobea coccinea** (which *see*).

SYMPHORICARPUS. To the species and varieties described on p. 530, Vol. III., the following should be added:

S. acutus (acute). *l.* oblong-lanceolate, acute or acuminate, softly tomentose, acute at base, sometimes toothed. Western North America, 1888. SYN. *S. mollis acutus.*

S. Heyheri (Heyher's). *fl.* rosy, pretty. *l.* rhomboid, of firm texture, with prominent veins. Colorado, 1888. SYN. *S. occidentalis Heyheri.*

S. occidentalis Heyheri (Heyher's). A synonym of *S. Heyheri.*

S. orbiculatus (orbicular). The correct name of *S. vulgaris.*

S. parviflorus (small-flowered). A synonym of *S. orbiculatus.*

S. puniceus (scarlet). The correct name of *Lonicera punicea.*

SYMPHYANDRA. To the species described on p. 531, Vol. III., the following should be added:

S. Hoffmanni (Hoffmann's). *fl.* white, drooping, 1in. to 1¼in. long; calyx lobes ovate-lanceolate, acute, entire. Summer. *l.* lanceolate, acute, serrated. *h.* 1ft. to 2ft. Bosnia, 1884. Allied to *S. pendula*, but more robust and floriferous and softly hairy. (B. M. 7298; G. C. 1888, iv., p. 760, f. 107.)

SYMPHYOSTEMON. To the species described on p. 531, Vol. III., the following should be added:

S. Segethi. *fl.* blue, solitary, having the bases of the six segments orange; sathe valves two. *l.* Rush-like, 3in. to 4in. long. Stem creeping. Chili. A very curious and interesting, hardy plant. SYN. *Susarium Segethi* (R. G., t. 1117, f. 1).

SYNADENIUM. *S. arborescens* (B. M. 7184) is purely of botanical interest.

SYNANDROSPADIX (from *syn*, confluent, together, *aner, andros*, a male, and *spadix*; in allusion to the disposition of the male flowers). ORD. *Aroideæ.* A monotypic genus. The species is a noble stove plant, probably requiring similar treatment to **Anthurium** (which *see*).

S. vermitoxicus (worm-poison). *fl.*, spathe greyish-green outside, flesh-coloured and shortly-lined inside, 6in. long, 4in. broad, ovate, open, caudate at apex; spadix rather shorter than the spathe, covered with purplish flowers; scape 1ft. high. October and March. *l.* large, annual, hastate-cordate, acute, undulated; petioles channelled. Tubers sometimes weighing 4lb. Tucuman, 1891. (B. M. 7242.)

SYNANTHERIAS (from *syn*, confluent, together, and *anthera*, an anther). ORD. *Aroideæ.* A monotypic genus. The species is a stove plant with the characters of **Amorphophallus** (which *see* for culture), but having the male and female inflorescences distant, with oblong, depressed, interposed neuters.

S. sylvatica (wood-loving). *fl.*, spadix yellow; spathe clouded, barred, and streaked with green and pale pink (as well as the petiole and peduncle), 2in. to 4in. long, the limb very short. May. *l.* one or two, 1½ft. to 2½ft. across; divisions once or twice pinnatifid; leaflets 2in. to 6in. long, lanceolate, long-acuminate. Tuber sub-globose, bulbilliferous. Deccan Peninsula to Ceylon. (B. M. 7190.) SYNS. *Amorphophallus sylvaticus, A. zeylanicus, Arum sylvaticum.*

SYNEILESIS. Included under **Senecio** (which *see*).

SYNNOTIA. J. G. Baker reduces the number of species to two, regarding *S. galeata* as identical with *S. bicolor.*

SYNTHYRIS (from *syn*, together, and *thyris*, a little door or valve; in allusion to the closed valves of the pod). ORD. *Scrophularineæ.* A genus comprising about half-a-dozen species of glabrous or pilose, hardy, perennial herbs, with thick rhizomes, natives of North-west America. Flowers bluish or reddish, racemose or spicate; calyx four-parted, the segments narrow; corolla tube very short or wanting, the lobes erecto-patent, imbricated; stamens two; peduncles scape-like, simple, with alternate, amplexicaul, leafy bracts. Leaves mostly radical and petiolate; those of the simple stem or scape all alternate. For culture of the species introduced, *see* **Veronica.**

S. pinnatifida (pinnatifid). *fl.* dark blue or whitish, handsome, disposed in narrow spikes. Summer. *l.* slender-stalked, round-reniform to oblong in outline, palmately to pinnately three- to seven-parted, or divided below and the divisions again cleft or parted. *h.* 9in. Rocky Mountains, 1889.

Synthyris—*continued.*

S. reniformis (kidney-shaped). *fl.* pale violet, about ¼in. long; corolla lobes oblong-lanceolate, unequal; raceme erect, 4in. to 6in. long, many- but not dense-flowered; peduncle stout, 5in. to 10in. long. April. *l.* 1½in. to 2½in. in diameter, orbicular-cordate, coriaceous, double-toothed. 1885. (B. M. 6860.)

SYRINGA. To the species and varieties described on pp. 536-7, Vol. III., the following should be added:

S. amurensis. According to the "Index Kewensis," this is the correct name of *S. japonica.*

S. Emodi aurea (golden). This only differs from the type in having the leaves blotched with dull yellow. 1886.

S. E. rosea (rosy). A variety with rosy-lilac flowers. 1883. (R. G. 1883, p. 492.) It is also known as *Bretschneideri.*

S. Josikæa eximia (choice).* *fl.* bright red in bud, turning to bright rose when open, larger than in the type and disposed in larger panicles. 1899.

S. pekinensis (Pekin). *fl.* white, in a dense panicle. *l.* ovate-deltoid, obtuse or acuminate, the long petioles and the midrib blackish-purple. Branchlets slender, flexuous, velvety, dark red. China, 1886. A very bushy shrub or small tree, nearly allied to *S. amurensis.* (G. & F. 1890, p. 165; f. 30.) SYN. *Ligustrina pekinensis.*

S. p. pendula (pendulous). This only differs from the type in its "weeping" habit.

S. persica laciniata (torn). A variety with leaves very deeply cleft.

S. p. mimosæfolia (Mimosa-leaved). A variety with impari-pinnate leaves. 1878. (R. H. 1878, p. 453, f. 95.)

S. persica (of gardens). *See* **S. dubia** (*S. chinensis*).

S. pubescens (downy). A synonym of *S. villosa* (which is figured in B. M. 7064).

S. rothomagensis is synonymous with *S. chinensis.*

S. vulgaris chamæthyrsa (ground-thyrse). A dwarf, monstrous form. 1894. (R. H. 1894, p. 370, f. 137-8.)

VARIETIES. The following are all good. *Single:* Aline Mocquery, Frau Dammann, Géant des Batailles, La Ville de Troyes, Marie Legrange, Noisettiana, President Grévy. *Double:* Charles Joly, Doyen Keteleer, Emile Lemoine, La Tour d'Auvergne, Leon Simon, Madame Casimir Perier, Madame Jules Finger, Souvenir de L. Thibaut, and Virginite.

SYRINGE. An indispensable implement for spraying and washing plants, damping the walls and floors of fruit- and plant-houses, frames, &c. The best Syringes are sold with two or three spare nozzles, viz., with a coarse and a fine one, and one that ejects the water in the form of a jet. A skilful man can direct water on the plants in the form of the finest spray or as coarse as he likes by the use of the finger applied to the nozzle while driving the water out of the Syringe with the other hand. There has been little or no improvement of late years in the form of the Syringe, Read's being still one of the best, and is universally used. A few years ago Messrs. Stotts, Manchester, introduced a Syringe with a small chamber at the end. In this chamber a solid insecticide is placed, and as the person using the Syringe forces the water out it becomes sufficiently impregnated with the insecticide in the chamber to kill the insects it is employed against, thus avoiding the trouble of dissolving the insecticide, and very little waste is experienced, as the liquid leaves the Syringe in the form of a fine spray through a patent nozzle.

SYRINGODEA. Seven species are referred to this genus by J. G. Baker; *S. pulchella* is the only one in cultivation.

TABEBUIA. To the species described on p. 1, Vol. IV., the following should be added. *T. chrysantha*, *T. serratifolia*, and *T. spectabilis* are now referred to **Tecoma.**

T. pentaphylla (five-leaved). *fl.* rose or purplish, large, disposed in pedunculate, dichotomous panicles. July and August. *l.* composed usually of five obovate, obtuse, stalked leaflets, scaly-pubescent on both sides. *h.* 15ft. Martinique, 1733. SYNS. *Bignonia pentaphylla, Tecoma pentaphylla.*

TACCARUM. *T. cylindricum* is the correct name of *T. peregrinum.*

TACHARDIA LACCA. *See* **Scale Insects.**

TACHIA. Two species formerly known under this name are now classed under **Leianthus** (which *see*). *T. Swartzii* is a synonym of *Leianthus exsertus.*

TACHIADENUS. *T. radiatus* (mentioned in the "Wiener Illustrirte Garten-Zeitung," 1889) appears to be intended for *T. carinatus.*

TACSONIA. To the species described on pp. 3-4, Vol. IV., the following should be added:

T. eriantha (woolly-flowered). A form of *T. mixta.*

T. exoniensis (Exeter). *fl.*, tube 2½in. long; limb 4½in. to 5in. across; sepals and petals brick-red, rose-pink within; throat violet. *l.* 5in. by 4in., downy. Before 1872. A hybrid between *T. Van Volxemii* and *T. mixta mollissima.*

T. ignea (fiery). A synonym of *T. manicata.*

T. Jamesoni (Jameson's). *fl.* bright, rich rose-colour, large; tube cylindrical, 4in. long; flower-stalk shorter than the leaves. *l.* glabrous, sub-orbicular, three-lobed, 2in. long, 2½in. broad. Ecuador. Greenhouse.

T. militaris (military). This is said to be a hybrid between *T. Van Volxemii* and *T. insignis*, but according to the "Kew Bulletin," the latter and *T. manicata* are more likely to be the parents. 1899. (G. C. 1899, xxvi., p. 484, f. 60.)

T. quitensis (Quito). A form of *T. mixta.*

T. Smythiana (Smyth's). A garden hybrid or seedling very similar to *T. mollissima*, but with brighter-coloured flowers. 1892. (G. C. 1892, xii., pp. 442, 704, f. 109.)

T. speciosa (showy).* A form of *T. mixta.*

T. tomentosa (downy). *fl.* rosy-red; involucre large, three-leaved. *l.* tomentose, trifid above the middle, three-nerved; lobes ovate, serrated; petioles glandular, bearing six pedicels; stipules falcate. Peru, 1870.

TÆNITIS. Fillet or Ribbon Ferns. These plants require a soil of a peaty nature (two parts peat to one of loam), a moist atmosphere, and abundant shading. They are generally propagated by the division of the crowns.

TAGETES. To the species described on pp. 4-5, Vol. IV., the following should be added:

T. erecta. Of this, the well-known African Marigold, the forms LEMON QUEEN and PRINCE OF ORANGE should be grown.

T. gigantea (gigantic). *fl.* unknown. *l.* opposite, pinnate, having a balsamic odour; leaflets soft, narrowly elliptic, toothed. Stem stout, pruinose, 6ft. to 9ft. high. Bolivia, 1886. A stout, half-hardy herb.

T. lacera (torn). *fl.* small, freely produced in lax, terminal panicles; florets of a clear orange-chrome or yellow. February to May. 1898. A half-hardy, sub-shrubby perennial, of neat and graceful habit. (G. C. 1898, xxiii., p. 355, f. 135.)

T. minuta (minute). The correct name of *T. glandulifera.*

TAIL. This term is also applied to any long, flexible appendage.

TAINIA. To the species described on p. 5, Vol. IV., the following should be added:

T. penangiana (Penang).* *fl.* yellow and brown, 2in. across; sepals acuminate; petals narrow; column broadly winged; scape 1ft. high, few-flowered. *l.* 8in. to 12in. long, 1½in. to 2in. broad (about equalling the slender petioles), elliptic-lanceolate, plicate. Pseudo-bulbs clustered, flagon-shaped. Penang, 1897. (B. M. 7563.)

T. speciosa (showy). *fl.* white, with the sepals and petals produced into long, filiform, slightly yellowish tails; lip many-nerved; scape 1ft. to 2ft. long. *l.* 4in. to 6in. long, ¾in. broad; petiole 6in. to 10in. long. Perak, &c.

T. angustifolia, a species allied to *T. latifolia*, is rare in cultivation.

TALIGALEA. A synonym of **Amasonia** (which *see*).

TALINUM. To the species described on p. 6, Vol. IV., the following should be added. Several plants formerly included hereunder are now referred to **Anacampseros** and **Calandrinia.**

T. roseum (rosy). *fl.* rose-coloured, produced in long panicles. Abyssinia, 1892. This is probably identical with *T. cuneifolium.*

TALISIA. To the species described on p. 6, Vol. IV., the following should be added:

T. princeps (first).* *fl.* whitish, small, very numerous, in large, branching panicles. *l.* forming a superb plume, spreading, broad, pinnate, acuminate, attaining 6ft. in length. Stem unbranched. Venezuela, 1883. This ornamental tree (before it flowered) has been known in gardens as *Theophrasta pinnata* (*Myrsinaceæ*) and *Browneа princeps* and *B. erecta* (*Leguminosæ*).

TAMARACK. *See* **Larix pendula** (*americana*).

TAMARIX. To the species described on p. 7, Vol. IV., the following should be added. One or two plants formerly included hereunder are now referred to **Myricaria.**

T. anglica (English). A synonym of *T. gallica.*

T. chinensis (Chinese).* *fl.* pink, in a long, slender, paniculate spike. *l.* very minute, imbricated, acute. Branches nodding, plumose. Canton. A graceful, hardy shrub. SYN. *T. japonica plumosa* (of gardens).

T. germanica (German). A synonym of *Myricaria germanica.*

T. hispida (hispid). *fl.* of a rosy-carmine, brighter than in other cultivated species, sub-sessile; raceme slender, laxly and shortly paniculate. August and September. *l.* very small, ovate-cordate, abruptly acuminate, adpressed, imbricated. Orient, 1893. A glaucous, densely velvety-pubescent, hardy shrub. SYN. *T. kashgarica.*

T. japonica plumosa (Japanese, feathery). A garden synonym of *T. chinensis.*

T. kashgarica (Kashgar). A synonym of *T. hispida.*

T. odessana (Odessa). *fl.* five-parted, disposed in compound racemes forming an ample panicle. *l.* lanceolate-subulate, very acute, decurrent. Branches elongated, erect; branchlets numerous, very slender. Bark reddish-fuscous. Odessa, 1891. Hardy shrub.

T. parviflora (small-flowered), of gardens. A synonym of *T. gallica.*

TAMUS. *T. Elephantipes* is synonymous with **Testudinaria Elephantipes** (which *see*).

TANACETUM. To the species described on p. 8, Vol. IV., the following should be added:

T. Balsamita. The correct name is *Chrysanthemum Balsamita.*

T. camphoratum (camphor-scented). The correct name of the plant figured in F. d. S., t. 1191, as *T. huronense*, which is pleasantly camphor-scented. The true *T. huronense* is not in cultivation.

T. fruticulosum bracteatum (slightly shrubby, bracted). *fl.-heads* yellowish, one to a bracteate peduncle, several of the coloured bracts crowded beneath the head, giving the appearance of a double involucre; inflorescence loosely corymbose. *l.* ¼in. to ½in. long, once or twice pinnatisect. Stems very numerous, 10in. to 14in. long; root woody. Mountains of Thibet, 1878. Plant hoary or woolly.

T. Herderi (Herder's). *fl.-heads* bright yellow, forming a fine contrast with the leaves. *l.* in compact silvery rosettes, produced in great profusion. Stems rather thick, branched. Turkestan. A capital dwarf plant for the rockery.

TANAKEA (named in honour of M. Tanaka, an ardent botanist). ORD. *Saxifrageæ.* A monotypic genus. The species is a hardy, scapose plant with an oblique rhizome. It is closely allied to *Leptarrhena*, but has ten stamens, and the petals are wanting. It will probably succeed under the culture recommended for **Tiarella** (which *see*).

T. radicans (rooting). *fl.* white, cymosely paniculate, very small; lower peduncles three-flowered, the upper ones one-flowered. *l.* thick, long-petiolate, 1in. to 2½in. long, ovate-lanceolate, rounded or sub-cordate and biplicate at base, acute at apex, unequally serrated, bristly. Rhizome oblique, densely fibrillose, stoloniferous. Japan.

TANGIER PEA. *See* **Lathyrus tingitanus.**

TAPEINÆGLE. A synonym of **Tapeinanthus** (which *see*).

TAPEINANTHUS (from *tapeinos*, low, and *anthos*, a flower; in allusion to the dwarfish habit of the plant). SYNS. *Carregnoa, Gymnoterpe, Tapeinægle.* ORD. *Amaryllideæ.* A monotypic genus. The species is a small, tunicated-bulbous plant, difficult of cultivation in this country.

T. humilis (dwarf). *fl.* solitary or twin, ¾in. in diameter; perianth yellow, funnel-shaped, with a very short tube, the segments narrow-oblong, erecto-patent, sub-equal, with a small scale at their base; scape very slender, 3in. to 4in. high. *l.*, perfect one appearing late, filiform, with a small, stipitate sheath at base. Spain, Tangiers, 1887. (G. C. 1887, i., p. 53, f. 13.)

TAPEINOPHALLUS. Included under **Amorphophallus** (which *see*).

TAPHRINA AUREA. *See* **Populus—Fungi.**

TAPHRINA BULLATA. *See* **Pear—Fungi.**

TARCHONANTHUS. Several species formerly included hereunder are now referred to **Brachylæna.**

TARENNA. The correct name of **Webera** (which *see*), according to the "Index Kewensis."

TAXODIUM. The correct name according to the Kew authorities and Dr. Masters of *T. heterophyllum* is *Glyptostrobus heterophyllus*, but Kent in Veitch's "Coniferæ" favours Brongniart's name of *T. heterophyllum. T. giganteum* and *T. sempervirens* are now classed under **Sequoia.**

TAXUS. To the species and varieties described on pp. 11-12, Vol. IV., the following should be added:

T. adpressa (adpressed). A variety of *T. baccata.*

T. baccata adpressa variegata (variegated). A pyramidal form, more erect than the type, and variegated at the tips with clear creamy-yellow. 1889.

T. b. albo-variegata (white-variegated).* *l.* silver-edged, touched with yellow in the winter. Very attractive.

T. b. aurea (golden).* *l.* golden. Branches yellow-tipped. A fine plant for winter bedding and for window-boxes.

T. b. Dovastoni. The sub-variety *aurea pendula** has pale green leaves, striped and margined with golden-yellow.

T. b. elegantissima (most elegant).* *l.* edged with creamy-white. This variety is paler, more erect, and more regular in growth than *variegata.*

T. b. monstrosa (monstrous). A form having much thicker and stronger branches than in the type.

T. b. nigra (black). *l.* bluish-green. Habit bold, erect.

T. b. pendula (pendulous).* *l.* very dark green. Branches pendulous. A splendid shrub for small gardens.

T. b. procumbens (procumbent). A spreading, bright green bush, tinted with red.

T. b. pyramidalis (pyramidal).* Allied to *cheshuntensis*, but having reddish bark on the young shoots and broader leaves. More compact and erect than the type.

T. b. stricta (erect). *l.* pale green, smaller than in *nidpathensis.* A dense, erect form.

T. b. Washingtoni (Washington's).* A beautiful, variegated form, free in growth and constant.

T. floridana (Florida). A bushy tree, rarely 30ft. high, with a short trunk occasionally 1ft. in diameter, and many stout, spreading branches. Florida, 1896. Not yet in cultivation in this country.

T. Harringtoniana (Harrington's). A synonym of *Cephalotaxus pedunculata.*

TCHIHATCHEWIA (named in honour of Count Paul de Tchihatchef, a famous Russian traveller and writer). ORD. *Cruciferæ.* A monotypic genus. The species is a singular and beautiful, hardy perennial, allied to *Isatis*, and very suitable for the rockery. For culture, *see* **Perennials.**

T. isatidea (Isatis-like).* *fl.* bright rosy-red, Vanilla-scented, densely disposed in a hemispheric, much-branched corymb 4in. across; petal limb oblong, half as long as the claw. May. *l.* 1¼in. to 2½in. long, spreading and recurved, the upper ones gradually larger, sessile, linear, hispidly hairy. Stem 6in. to 10in. high, very stout. Armenia, 1893. (B. M. 7603; R. H. 1895, f. 116-17.)

TEA-TREE, BRAZILIAN. *See* **Stachytarpheta indica** (SYN. *S. jamaicensis*).

TECOMA. To the species described on p. 13, Vol. IV., the following should be added. *Tabebuia chrysantha, T. serratifolia*, and *T. spectabilis* are now classed under this genus.

T. amboinensis (Amboyna).* *fl.* orange-red, 3in. to 4in. long, freely produced in axillary racemes. *l.* pinnate. Amboyna, 1886. A handsome, stove climber.

T. grandiflora. SYN. *Incarvillea grandiflora* (of Poir). Of this fine species there are several hybrid varieties, including MME. GALEN, *rubra*, and *sanguinea* (SYN. *purpurea*).

T. Mackenii (Macken's). A synonym of *T. Ricasoliana.*

T. Manglesii (Mangles'). A form of *T. australis.*

T. radicans. Of this species there are many colour varieties, ranging from yellow to dark red, as well as late (*Thunbergii*) and early (*præcox*) ones.

T. Ricasoliana (Ricasol's). *fl.* in terminal panicles; corolla delicate rose-pink, with darker veins, the tube somewhat inflated or narrowly funnel-shaped, the limb spreading. *l.* pinnate; leaflets ovate, acute, toothed. South Africa, 1887. A handsome, greenhouse species. SYN. *T. Mackenii.*

T. sambucifolia is a form of *T. stans.*

T. Smithii (Smith's).* This is not a hybrid, as has been stated, but is synonymous with *T. fulva.* (G. C. 1893, ii., 104; Gn. 1895, ii., 1022.)

TECOPHILÆA. To the species and variety described on p. 14, Vol. IV., the following should be added:

T. cyanocrocus Leichtlinii (Leichtlin's). *fl.* of a deep blue, as in those of *Gentiana verna*, without a trace of yellow. 1886.

TELEUTOSPORE. *See* **Puccinia.**

TELLIMA. Including *Lithophragma.* To the species described on p. 14, Vol. IV., the following should be added:

T. grandiflora purpurea.* This is a handsome variety, with very ornamental foliage in autumn.

T. parviflora (small-flowered). *fl.* deep pink, rather large; petals much exserted; raceme at first short, elongated in fruit. May and June. *l.* ternately divided or parted, the segments three-cleft. Stems 1ft. to 1½ft. high, with one or two leaves. Plant canescently hairy. SYN. *Lithophragma parviflora.*

Temperate House—*continued.*

38ft. high. The total length of the building, including lobbies, is 628ft., and the width 164ft. A broad, straight path extends the whole length of the centre, and forms a unique promenade, and is probably the finest sight of the kind in the world, as the trees in the central division tower up to the roof, and in the wings the plants are already almost up to the roof (Fig. 709). This splendid house (the front of which is shown at Fig. 710) is the largest plant structure in the world, and cost about £60,000. For the information as to the size and cost of the Temperate House we are indebted to the "Journal of the Kew Guild for 1899."

TENAGOCHARIS. A synonym of **Butomopsis** (which *see*).

FIG. 709. INTERIOR OF TEMPERATE HOUSE AT KEW.

TEMPERATE HOUSE. At Kew the Temperate House is a well-known object. It was designed by Mr. Decimus Burton, and built by Messrs. W. Cubitt and Co., in 1860. The large central division was completed in 1862, and is 216ft. long, 140ft. wide, and 60ft. high. The two octagons connect the north and south wings, each octagon being 54ft. in diameter. The south wing is known as the Mexican House, and is filled with Mexican plants, many of them being of great beauty. This wing was finished in 1897, and the north wing in May, 1899. This is filled with choice Rhododendrons, Camellias, Bamboos, &c., and is a fine sight when the trees are in blossom. Each of the wings is 116ft. long, 64ft. wide, and

TENORIA (of Sprengel). Included under **Bupleurum** (which *see*).

TENTACLES. Sensitive hairs or filaments, such as those of Drosera-leaves.

TENTACULATE. Having thread-like appendages (tentacles).

TENTHREDO TESTUDINEA. This is an old name for **Hoplocampa testudinea**, or **Apple Sawfly** (which *see*).

TEPALS. Prof. H. G. Reichenbach's name for the inner perianth segments (petals) of Orchids.

TEPHROSIA. *Mundulea suberosa* is the correct name of *T. suberosa*.

TERMINALIA. *T. angustifolia* is the correct name of *T. Benzoin*. *T. elegans* is a garden synonym of *Polyscias paniculata*.

TERMITES. *See* **White Ants.**

TERRESTRIAL. Growing on the ground, not on trees or in water.

TETRACLINIS ARTICULATA. The correct name of **Callitris quadrivalvis** (which *see*).

TETRAMICRA. *T.* (*Leptotes*) *serrulata* is synonymous with *T. bicolor*. *T. minuta*, a species introduced in 1889, is, as its name implies, very small—the whole plant is scarcely 2in. high—and is of little decorative value. The following variety may be noted:

T. bicolor brevis (short). This differs from the type in having shorter segments and a white lip. 1892.

TEUCRIUM. To the species described on pp. 22-3, Vol. IV., the following should be added:

T. multiflorum (many-flowered). *fl.* light red; whorls two- to six-flowered, distant, racemose. August. *l.* shortly petiolate, ovate, acute, ¼in. to ⅓in. long, sometimes hoary beneath. *h.* 1ft. Spain, 1732. Half-hardy shrub.

Thalictrum—*continued.*

T. adiantifolium (Adiantum-leaved). A form of *T. minus*,

T. angustifolium (narrow-leaved). *fl.* pale yellow, fascicled at the tips of the branches of the dense, corymbose panicle. June. *l.* ternately decompound; segments variable in form. *h.* 3ft. Root fibrous. South and Central Europe, 1793.

T. aquilegifolium rubrum (red). *fl.* of a rosy-lilac tint 1889.

T. Chelidonii (Chelidonium-like).* *fl.* lilac, or purple, 1in. in diameter; sepals elliptic, obtuse; panicle with long, rigid branches. *l.* ternately divided, pale green above, glaucous beneath; leaflets of the lower leaves 1in. in diameter, orbicular-cordate, crenate or lobed; floral ones sharply toothed. Himalayas. A pretty, dwarf, usually much-branched herbaceous species. See Fig. 711, for which we are indebted to the "Gardeners' Chronicle."

T. Delavayi (Delavay's). *fl.* pale purple, disposed in lax panicles; sepals ¼in. long. June. *l.*, radical ones long-petiolate, ternately decompound, 10in. to 12in. broad; leaflets obtusely three- to five-lobed, cordate at base. Stems 2ft. to 3ft. high. Yunnan, China, 1890. (B. M. 7152; G. C. 1890, vii., p. 124, f. 19.)

T. rhynchocarpum (beak-fruited). *fl.* greenish, numerous, small, borne upon hair-like pedicels Summer. *l.* resembling Maidenhair, two to four times pinnately divided; leaflets simple or ternate, usually ovate or cordate, three-lobed or broadly three- to seven-toothed. Stem erect, 4ft. to 10ft. high. Transvaal, tropical Africa, 1892. Half-hardy perennial.

T. sylvaticum (sylvan). A synonym of *T. minus*.

FIG. 710. EXTERIOR OF TEMPERATE HOUSE AT KEW.

T. Polium. Poly Germander. *fl.* white, yellowish, or purple, small; whorls few, in globose or oblong, terminal heads. Summer. *l.* cuneate, oblong, or linear, sessile, crenate, softly rugose. Stems much-branched from the base. Branches procumbent, ascending, or sub-erect, 5in. to 6in. long. Europe, &c., 1562. A half-hardy, evergreen, hoary-tomentose, woolly, or pilose-hispid shrub. Rockery.

T. P. purpureum (purple). *fl.* bright rosy-purple. *h.* 6in. to 9in. There are several other varieties.

T. purpureum (purple). A variety of *T. Polium*.

T. pyrenaicum (Pyrenean). *fl.* purplish and white; whorls few, disposed in solitary, dense, terminal heads 1in. in diameter. Summer. *l.* petiolate, round, crenate, ¼in. to ⅜in. in diameter; floral ones oblong-linear, acute, entire. Stem (as well as the branches and leaves) downy. *h.* 3in. to 6in. South Europe. Half-hardy shrub.

T. Scorodinia variegatum. A good plant for the rockery or the border.

TEXAS UMBRELLA TREE. *See* **Melia Azedarach umbraculiformis.**

THALIA. *See also* **Stromanthe.**

THALICTRUM. To the species and varieties described on pp. 23-4, Vol. IV., the following should be added:

THAMNOCALAMUS. Included under **Arundinaria** (which *see*).

THELESPERMA. To the information given on p. 25, Vol. IV., the following should be added. For culture, *see* **Coreopsis.**

T. filifolium (thread-leaved). *fl.-heads*, rays yellow, broad, over ½in. long; disk usually purple, turning brownish. Summer. *l.* not rigid, bipinnately divided into filiform lobes no wider than the rachis. *h.* 1ft. to 2ft. Arkansas to Texas. A loosely branching, hardy annual or biennial.

T. f. Burridgeanum (Burridge's).* *fl.-heads* having the rays orange-yellow, 1in. long, three-lobed, with a large basal, dark brownish-purple mark. June to September. A hybrid between *T. filifolium* and *Coreopsis tinctoria*. SYN. *Cosmidium Burridgeanum* (of gardens).

THELYMITRA. To the species described on pp. 25-6, Vol. IV., the following should be added:

T. grandiflora (large-flowered).* *fl.* greyish-blue, about thirty in a dense spike; sepals and petals concave, ½in. long; hood very flat, the space between the two lateral appendages consisting of two large wings. *l.* lanceolate, 9in. long, forming a closed sheath for 3in. to 4in. *h.* 1½ft. to 2½ft. Australia. The best species known. (F. A. O. ii., part iii.)

THEMISTOCLESIA. The words "Including *Centrostemma*" should be deleted. This genus is allied to *Ceratostema*.

THEOPHRASTA. This genus now embraces about seven species. *T. densiflora* is the correct name of *T. Jussæi* (B. M. 4239); the true *Jussieui* is not in cultivation. *T. antioquiensis* is a synonym of *Clavija cauliflora*.

THIBAUDIA. *See also* **Agapetes.**

THINOGETON. A synonym of **Cacabus** (which *see*).

THISTLE, GOLDEN. This name is also applied to **Protea Scolymus** (which *see*).

THLASPI. *T. arabicum* is synonymous with **Æthionema Buxbaumii** (which *see*).

FIG. 711. THALICTRUM CHELIDONII.

THOMAS'S PHOSPHATE or BASIC SLAG, of which the following data show the chief constituents, is a manure which has recently come largely into use. The figures show that it contains a large proportion of lime (which is in a caustic condition), phosphoric acid, and iron oxides. It is of various manurial qualities, ranging from about 12 per cent. of phosphoric acid (equal to 26 per cent. of tribasic phosphate of lime) to over 20 per cent. of phosphoric acid (equal to nearly 44 per cent. of phosphate), so that guarantees of quality should be carefully considered by the purchaser.

SELECTED CONSTITUENTS IN BASIC SLAG.

Lime	45·04 per cent.
Magnesia	6·20 ,,
Phosphoric acid	18·11 ,,
Iron oxides	17·56 ,,
Silica	6·90 ,,
Manganese	3·51 ,,

Thomas's Phosphate—*continued.*

Experiments with Basic Slag have indicated that to produce the same effects as superphosphate, at least twice the quantity should be applied in the form of slag as would suffice in that of superphosphate. Soils poor in lime, or those inclined to be wet and sticky, are most benefited by Basic Slag, provided that they contain plenty of organic matter. Basic Slag is a manure well adapted for fruit trees, flowering shrubs, Roses, lawns, paddocks, and pastures. It must not be used in combination with ammonia salt, because it sets the ammonia free, and causes a loss of plant-food. It may, however, be mixed with nitrate of soda.

THOMSONIA. *T. Hookeri* is now regarded as identical with *T. nepalensis*.

THORN, EGYPTIAN. *See* **Acacia vera.**

THRIFT, PRICKLY. *See* **Acantholimon.**

THRINAX. To the species described on p. 29, Vol. IV., the following should be added. Several others are grown in botanical collections.

T. microcarpa (small-fruited). *fl.*, spadix elongated, with slender branches. *fr.* about the size of Peas. *l.* orbicular, coriaceous, pale silvery-green below, much-cleft; petioles flexible. Trunk 30ft. high. Florida, 1896.

T. Morrisii (Morris's). *fl.*, spadix 2ft. long, with nine to twelve recurved branches; spathes numerous, tubular. *l.* terminal, sub-orbicular, glaucescent beneath; segments about thirty, acuminate, 1ft. long, conspicuously nerved above, the margins yellowish-white. Caudex club-shaped, 3ft. high. West Indies. (G. C. 1891, ix., p. 700; 1892, xi., pp. 112-13, f. 20, 21.)

THUJOPSIS. *See* **Thuyopsis.**

THUNBERGIA. This genus now embraces about seventy-five species. To those described on pp. 32-3, Vol. IV., the following should be added:

T. affinis pulvinata (related, cushioned). *fl.* ample, subsolitary; corolla violet, the tube yellow within and tinged yellow outside, twice as long as the bracts, recurved above the base, the lobes ample, rounded, retuse. September. *l.* shortly petiolate, elliptic, acute or obtuse, entire, acute at base. Stem quadrangular, rambling, becoming woody and very hairy. Zanzibar, 1886. (B. M. 6975, under name of *T. affinis*.)

T. albiflora (white-flowered). A synonym of *T. alata*.

T. aurantiaca (orange). A variety of *T. alata*.

T. Doddsii (Dodds'). A variety of *T. alata*.

T. grandiflora alba (white). A variety having pure white flowers. 1892.

T. Hookeriana (Hooker's). The correct name of *T. Kirkii*.

THUNDER-PLANT. *See* **Sempervivum tectorum.**

THUNIA. These are most decidedly deciduous Orchids, and therefore the cultural requirements are vastly different from those afforded to the evergreen section of *Phaius*, under which heading botanists have thought fit to class them. The potting compost of good fibrous loam and peat, mixed with a liberal sprinkling of chopped sphagnum and rough sand, is all that is required. The potting should be done as soon as the plants commence growing, in the early spring. They should be placed several together in a pot, and a stick, sufficiently strong to secure the plants in the desired position, should be affixed to each, all dead and decaying matter having previously been removed. The pots used should be drained to one-third their depth, the remaining space being filled with the potting compost; the plants should be placed in position, and the material made firm about the base. Little water will be required at first, but as soon as the new roots have got well hold of the compost, they require a liberal amount of root-moisture. As the flowering season advances, and the pots become filled with roots, frequent waterings will be essential, and a weak application of liquid cow-manure once or twice a week will be beneficial. During the growing season a light position and a hot, humid atmosphere are most desirable. Occasional syringing overhead will be of advantage, and will also aid in checking Red Spider and other pests from which they are liable to be attacked. When the flowers have been removed, the bulbs quickly finish up their growths, and every encourage-

Thunia—*continued.*

ment must be afforded to enable them to do so thoroughly. As soon as they are properly matured, and their leaves commence to drop, the plants should be removed to drier and more airy quarters. When the whole of the foliage has died away, the plants should be placed in a dry, light position until the return of spring, when they quickly show indications of restarting into growth.

Hybrid.

NAME.	PARENTAGE AND RAISER
Veitchiana	*Marshalliana* and *Bensoniæ* (Veitch).

Thuya—*continued.*

T. gigantea aurea (golden).* A handsome variety with golden foliage. 1897.

T. g. compacta (compact).* A very handsome variety, of compact growth.

T. g. plicata (folded).* Similar in habit to the type, but not so vigorous and more bushy. It is very decorative and thrives in poor soils and exposed situations. SYN. *T. occidentalis plicata*. The sub-variety *lutea* has rich yellow foliage and is very attractive in winter.

T. gigantea (of gardens). A synonym of *Libocedrus decurrens*.

FIG. 712. THUYA ORIENTALIS.

THUYA. Thuyopsis (which *see*) is now included hereunder. To the species and varieties described on pp. 33-4, Vol. IV., the following should be added:

T. caucasica (Caucasian). A synonym of *T. occidentalis Wareana*.

T. chilensis (Chilian). A synonym of *Libocedrus chilensis*.

T. Craigiana (Craig's), of Murray. A synonym of *Libocedrus decurrens*.

T. Craigiana (of gardens). A synonym of *T. gigantea*.

T. dolabrata (hatchet-leaved). The correct name of *Thuyopsis dolabrata*.

T. japonica (Japanese). The correct name of *T. Standishii*.

T. Lobbii (Lobb's). A synonym of *T. gigantea*.

T. Menziesii (Menzies'). A synonym of *T. gigantea*.

T. obtusa (obtuse). A synonym of *Chamæcyparis obtusa*.

T. occidentalis Dicksoni (Dickson's). *l.* rich green in summer, stained with bronzy-yellow in winter. Of pyramidal habit, sparsely branched, free in growth.

T. oc. erecta viridis (erect, green). Bushy, much-branched, neat, and distinct.

Thuya—*continued.*

T. oc. plicata (folded). A synonym of *T. gigantea plicata.*

T. oc. Spathii (Spath's). A seedling variety having thread-shaped young shoots, which become regularly feathered the second year. 1890. (R. G. 1890, p. 226, f. 54.)

T. oc. Wagneri (Wagneri). A variety of compact, narrow, pyramidal habit. 1896.

T. oc. Wareana (Ware's). Vigorous, compact, and superior to the type; its short, horizontal branches clothed with deep green leaves. SYN. *T. caucasica.* The sub-variety *lutea* has yellow leaves.

T. orientalis aurco-variegata (golden-variegated). *l.* pale yellow. A taller grower than *aurea.* The type is shown at Fig. 712.

T or. compacta (compact). *l.* bright green. A distinct and pleasing dwarf variety.

T. or. ericoides (Heath-like).* *l.* at first tender green, changing in autumn to brownish-violet. *h.* 3ft. A gem for the rock-garden and for winter bedding.

T. or. meldensis (Melden). A supposed hybrid between the Virginian Red Cedar and the Chinese Arbor Vitæ. 1852.

T. or. minima (smallest). *l.* bronzy in winter. A dense, low bush.

T. pendula (pendulous). A name applied to varieties of *T. occidentalis* and *T. orientalis.*

T. pisifera (Pea-bearing). A synonym of *Chamæcyparis pisifera.*

T. tatarica is a form of *T. occidentalis.*

T. t. compacta (compact). A garden variety, of compact, narrow, conical growth. 1886.

THUYOPSIS. *T. borealis* is a synonym of *Chamæcyparis nutkatensis,* and *T. dolabrata nana* is identical with *T. d. lætevirens. T. d. nidifera* is a form with plume-like branchlets. *T. Standishii* is a synonym of *Thuya japonica.*

THYLACANTHA. A synonym of **Angelonia** (which *see*).

THYME, WATER. *See* **Elodea.**

THYMELÆA. According to the "Index Kewensis," *Passerina hirsuta* is the correct name of *T. hirsuta.*

THYMUS. To the species and varieties described on p. 36, Vol. IV., the following should be added:

T. azoricus (Azores). A pretty little rockery plant, with purple flowers, allied to *T. Serpyllum.* It should be potted in light, loamy soil. (L. B. C. 1530.)

T. bracteosus (bracteate). *fl.* having a villous calyx. Summer. *l.* petiolate, oblong, narrowed at base, flat; floral ones sessile, broadly rounded-cordate, imbricated, ciliated. Flowering branches ascending. Dalmatia.

T. citriodorus. According to the Kew authorities, this is the correct name of *T. Serpyllum vulgaris.* There is a silver variegated form known as Fraser's Silver, that is an excellent rockery subject.

T. c. aureus (golden).* A dense, compact, variegated, more robust, evergreen form, 9in. high.

T. lanuginosus (woolly). A form of *T. Serpyllum,* according to Kew.

T. Mastichina (mastic-like). *fl.* white; whorls few, all or the upper ones in globose, terminal heads. Summer. *l.* petiolate, ovate or oblong, obtuse, narrowed at base, naked; upper and floral ones broader. Spain. A diffuse, ascending, or procumbent under-shrub.

T. Serpyllum albus (white). A beautiful, white garden variety.

T. S. atropurpureus (dark purple).* This dark purple variety is one of the finest subjects for the rockery. North of England, 1883.

T. S. coccineus (red) is an ornamental, crimson form.

T. S. rotundifolius (round-leaved). A dwarfer and more floriferous form than the type, with rounder leaves. 1879.

THYRSACANTHUS. The correct name of *T. indicus* is, according to C. B. Clarke, in Hooker's "Flora of British India" (iv. 497), *Eranthemum indicum.*

THYRSOPTERIS. *T. elegans* is a thoroughly distinct plant, requiring only greenhouse temperature, shade, and an abundance of water at the roots. Although fertile fronds have at various times been produced in this country, and every possible attention has been paid to the sowing of their spores, there is no record of any young plants having been so raised, and the propagating of this handsome Fern has therefore been limited to the rooting of the lateral shoots which are produced on the trunk.

THYSANACHNE. A synonym of **Arundinella** (which *see*).

THYSANOPTERA. *See* **Thrips.**

THYSANURA. *See* **Aptera.**

TIBOUCHINA. According to the Kew authorities, this is now the correct name of the genus formerly known as **Pleroma** (which *see*).

TICKSEED. *See* **Coreopsis.**

TICOREA. *Galipea multiflora* is the correct name of *Ticorea jasminiflora.*

TIGRIDIA. This genus includes eight distinct species. To the species and varieties described on pp. 38-9, Vol. IV., the following should be added:

T. buccifera (horn-bearing).* *fl.*, perianth 2in. across, with a purple-dotted, greenish-yellow base, the blade of the outer segments purple, obovate, the inner segments tubular-folded in the centre; spathe valves 1½in. to 2in. long. *l.* nearly as long as the stem, linear, plicate, ¼in. broad. Stem branched, 1ft. long. Mountains of Mexico, 1888. A very beautiful, half-hardy species. (G. & F. 1889, p. 412, f. 125.)

T. grandiflora (large-flowered). A synonym of *T. Pavonia.*

T. liliacea (Lily-like). A synonym of *T. Pavonia liliacea.*

T. Meleagris. The correct name is *Hydrotænia Meleagris.*

FIG. 713. TIGRIDIA PAVONIA ALBA.

T. Pavonia alba (white).* *fl.* pearly-white, large, marked at the base of the perianth segments with large spots of reddish-brown on a yellowish ground. 1882. This plant has the general habit of *T. P. conchiflora,* from which it is presumed to have originated. In the form *immaculata* the spathe is snow-white without spots, and in RUBY QUEEN the flowers are soft rose. See Fig. 713.

T. P. flava (yellow). *fl.*, spathe yellow. 1896. A distinct variety.

Tigridia—*continued.*

T. P. liliacea (Lily-like). *fl.* reddish-purple, with almost white variegation. 1893. Supposed to be an accidental hybrid between the typical species and *T. P. alba.*

T. P. rosea (pink). *fl.* yellow, tinged with rose. 1893. Supposed to be an accidental hybrid between *T. Pavonia* and its variety *conchiflora.*

Other varieties are: *grandiflora, Watkinsoni,* and *Wheeleri.*

T. Pringlei (Pringle's).* *fl.*, perianth with a campanulate base, blotched within with crimson; sepals 2½in. long, with a reflexed, scarlet limb; petals broadly cordate or reniform at base, the narrower, triangular-ovate, acute limb not spotted. July and August. Stem slender, 1ft. to 2ft. high, with two or three winged, plicate leaves, and a single flower. Bulbs small, with fusiform roots. South Mexico, 1883. Half-hardy. (B. M. 7089; G. & F. i., p. 389, f. 61.)

T. Van-Houttei. The correct name is *Hydrotœnia Van-Houttei.*

TILIA. To the species and varieties described on p. 40, Vol. IV., the following should be added:

T. americana pubescens (downy). A synonym of *T. pubescens.*

T. argentea orbicularis (orbicular). *l.* thick, coriaceous, orbicular or rhomboid, cordate at base, silvery beneath. Branches pendent. 1890. A seedling variety.

T. Beaumonti (Beaumont's). A synonym of *T. platyphyllos obliqua.*

T. euchlora (beautiful green) A synonym of *T. dasystyla.*

T. platyphyllos corallina (coral-red). Young branches assuming a deep red tint during the winter.

T. p. macrophylla (large-leaved). *l.* very large.

T. p. obliqua (oblique). *l.* markedly oblique at base. SYN. *T. Beaumonti.*

T. p. oxycarpa (sharp-fruited). *fr.* prominently five-ribbed. *l.* coarsely toothed.

T. p. pendula (drooping). A variety with pendulous branches.

T. p. tortuosa (twisted). Branches curiously curved and twisted.

T. pubescens (downy). *fl.*, buds and peduncles pubescent. *l.* 2in. to 4in. long (much larger on small trees), pubescent at first, afterwards glabrous above. United States, 1726. This species is of no great value as an ornamental tree in Great Britain. SYN. *T. americana pubescens.*

T. sylvestris (sylvan). A synonym of *T. cordata.*

T. mandschurica and *T. Miqueliana* (G. & F. 1893, p. 111, f. 19) have also been introduced. The former does not promise to equal any of the European species, and the latter has not yet been sufficiently tried.

TILLANDSIA. According to J. G. Baker, this genus —by far the largest of the Order *Bromeliaceæ*—now embraces upwards of 300 species, of very variable habit. To the species and varieties described on pp. 42-6, Vol. IV., the following should be added:

T. anceps. *T. setacea* (of Hooker) is a synonym of *T. compressa,* and *T. tricolor* is a form of *T. punctulata.*

T. Armadæ (Armada). *l.*, radical ones lorate, attenuated at apex, 16in. long, 2in. to 2½in. broad, very glabrous, finely striated, violet, more or less tinged with green or pale at the edge. Armada, South Columbia.

T. bivittata (two-striped). A garden synonym of *Cryptanthus bivittatus.*

T. Bloki (Blok's). Apparently synonymous with *T. regina.*

T. bulbosa. There are two varieties—*T. b. erythræa* (SYN. *T. picta,* B. M. 4283) and *T. b. variegata.*

T. compressa (compressed). *fl.*, petals white, the blade shorter than the stamens; spike dense, simple, 6in. to 8in. long; bracts reddish-yellow, ovate, 1½in. long; peduncle 6in. long. June. *l.* densely rosulate, ensiform, acuminate, ovate at base, 1½in. broad; blade 1ft. to 1½ft. long, convolute in the upper half. Jamaica, 1833. SYN. *T. setacea* (B. M. 3275).

T. corallina (coral-flowered). *fl.* numerous, on an erect scape longer than the leaves; sepals yellowish or greenish, thick, shining, exuding a diaphanous, gummy substance; petals pale yellow, longer than the sepals; bracts purple-violet, foliaceous, half-amplexicaul. *l.* quite entire, canaliculate, obtuse, mucronate, 1½ft. long, 2in. broad, glaucous-violet below, and with a greenish-blue tint above tranversely marked with dark, wavy lines. SYN. *Encholirion corallinum* (F. M. n. s., t. 116; I. H. xviii. 70).

T. c. roseum (rosy). A slight variety, with smaller flower-bracts than in the type.

T. c. r. variegatum (variegated). *l.* striped with yellowish bands. 1884. An ornamental plant, of garden origin.

T. c. splendens (splendid). *l.* more compact, more obtuse, and broader than in the type. 1885.

Tillandsia—*continued.*

T. didisticha is now correctly known as *T. Lorentziana.*

T. Dugesii (Duges'). *fl.*, corolla deep purple, ½in. longer than the calyx; panicle 1ft. long; peduncle shorter than the leaves and closely sheathed by bracts, the bases of which (as well as the rachis) are glossy and crimson. *l.* densely rosulate, 5in. to 6in. long, ensiform-setaceous from an ovate base, thinly lepidote. Mexico, 1897. (G. & F. 1897, p. 44, f 7.)

T. (Vriesia) Falkenbergii (Falkenberg's). A garden name for *T. heliconioides.*

T. foliosa (leafy).* *fl.*, petals lilac, convolute in a cylindrical tube shorter than the stamens; inflorescence a dense, short panicle of many ascending, dense, distichous, simple spikes 1½in. to 2in. long, the lower branch-bracts pointed; peduncle shorter than the leaves. *l.* densely rosulate, ensiform, acuminate, ovate at base, 1ft. long, ½in. to ¾in. broad. Central America, 1873. A showy species.

T. Fuerstenbergii (Fuerstenberg's). The plant usually catalogued under this name is correctly *Streptocalyx Fuerstenbergii.*

T. Geissei (Geisse's). *fl.* rosy, disposed in a simple, few-flowered spike; bracts green at base, carmine above; stem 6in. to 8in. high. *l.* linear-subulate, channelled, silvery. Chili, 1889. A small species. (R. G., t. 1302, f. 2.)

T. Glaziovii (Glaziou's). *fl.*, calyx as long as the bracts; petal-blade ½in. long; inflorescence a moderately dense, non-distichous spike 3in. to 4in. long; bracts 1½in. long; peduncle 6in. to 8in. long. *l.* about twenty in a dense rosette, with an ovate base 1in. to 1½in. broad, and a reflexing, linear-convolute, rigidly-coriaceous blade 2in. to 3in. long, thinly lepidote. South Brazil.

T. gracilis is now correctly known as *T. procera.*

T. Hamaleana. J. G. Baker regards *T. umbellata* (R. H. 1886, p. 60) as a form of this species.

T. imperialis (imperial), of Carrière. A form of *T. regina.*

T. Kirchoffiana (Kirchoff's). A synonym of *T. Leiboldiana.*

T. Krameri (Kramer's). A form of *T. psittacina.*

T. Leiboldiana (Leibold's).* *fl.* in simple, dense spikes 1½in. to 2in. long; petals lilac, convolute in a tube ½in. long; bracts bright red, ¾in. to 1in. long; peduncle much shorter than the leaves. *l.* densely rosulate, ensiform, acuminate, 1ft. to 1½ft. long, ¾in. to 1in. broad, not very rigid. Central Mexico, 1883. A magnificent species. SYN. *T. Kirchoffiana* (R. G. 1889, t. 1302, f. 2).

T. Lindeni. Of this species there are several varieties—*flore-pleno, Koutsinskyana, major* (*splendida*), *tricolor, violacea.*

T. lineata (lined). *l.*, radical ones lorate, glabrous, finely striated, green striped with violet above, violet on the under-surface. Columbia.

T. longibracteata (long-bracted). *fl.* yellow, in a dense, simple spike 1ft. long and 3in. broad; bracts 2in. to 2½in. long; peduncle stiffly erect. *l.* thin, flexible, lorate, almost glabrous, 1½in. to 2ft. long, 1½in. to 2in. broad, narrowed to the apex, or rounded and cuspidate. Venezuela and Trinidad, 1897. SYN. *Vriesia longibracteata.*

T. Lorentziana (Lorentz'). The correct name of *T. didisticha.* (R. G. 1349.)

T. Lubbersii (Lubbers'). *fl.* few, in a lax, simple, distichous spike 2in. to 3in long; petal-blades white, ½in. long; bract greenish-red, nearly 1in. long; peduncle slender, 6in. to 8in. long. *l.* twelve to twenty, densely rosulate, ensiform from an ovate base, 6in. to 8in. long, ½in. broad, pale glaucous-green. South Brazil, 1882. SYN. *Vriesia Lubbersii.*

T. magnifica (magnificent). This is described as "a pretty plant, undoubtedly of garden origin."

T. Makoyana (Makoy's). *fl.* in a lax, simple spike 5in. to 6in. long; corolla violet, ½in. longer than the calyx, which is ¼in. longer than the bracts; peduncle 1ft. long. *l.* densely rosulate, lanceolate, acuminate, 1½ft. long, 2in. broad low down, gradually tapering to a long point, channelled down the face. Mexico, before 1879.

T. Martelli (Martell's). *fl.* bright red. This is a near ally of *T. zebrina,* but the leaves are narrower and whitish at the base. Habitat not recorded, 1898.

T. Massangeana superba (superb).* *l.* blotched and transversely barred with a dark bronzy shade upon a paler ground. 1892. A fine plant, of vigorous growth; probably a variety of *T. splendens.*

T. microxiphion (small-bladed). *fl.* few, in a dense, terminal spike; bracts pink; petals violet-purple, lingulate, spreading at apex. February. *l.* linear, rigid, pale green, lepidote, about 1in. long, deeply channelled above, rounded at back. Stems short, erect, densely leafy. Monte Video, 1890. Allied to *T. stricta.* (B. M. 7320.)

T. Moensiana (Moens'). *l.* 4in. wide, tapering to the apex, creamy-yellow, veined or mottled, margined with green, elegantly recurved. *h.* 5ft. Habitat not recorded, 1892. A near ally of *T. regina.*

T. Moreliana (Morel's). A synonym of *Billbergia vittata.*

T. musaica (Mosaic). A synonym of *Caraguata musaica.*

Tillandsia—*continued.*

T. oligantha (few-flowered). *fl.*, calyx bright red; petals white, convolute in a tube more than ½in. longer than the calyx; spike lax, simple, 3in. to 4in. long, the bracts bright red, ¾in. long; peduncle 1ft. long, the upper bract-leaves bright red. *l.* densely rosulate, ensiform, acuminate, ovate at base, less than 1ft. long, ½in. broad, rigidly coriaceous. South Brazil, 1885. SYN. *Vriesia rubida.*

T. Pastuchoffiana (Pastuchoff's), of gardens. According to Baker, this is probably the same as *T. Morreni.*

T. picta (painted), of B. M. 4288. A synonym of *T. bulbosa erythræa.*

T. procera (tall). The correct name of *T. gracilis.*

T. psittacina Krameri (Kramer's). A form having entirely red flower-bracts. (B. M. 5108, under name of *T. Krameri.*)

T. p. Morreniana (Morren's).* A handsome variety, having more numerous and more approximate flowers than the type. 1882. (R. H. 1882, p. 287, t. 10-12, f. 2, by error numbered 3.)

T. pulverulenta lineata (powdery, lined). *l.* ascending, with recurved tips, gradually narrowing from a very broad base to the acute apex, green, with mealy hairs, and longitudinally striped with yellow; rosette 6ft. to 7ft. in diameter. Brazil, 1888. SYN. *Vriesia pulverulenta lineata* (R. H. 1888, p. 89, f. 20).

T. punctulata (slightly dotted). *fl.*, petals lilac, convolute in a tube 1in. longer than the calyx; spike dense, simple, 3in. to 4in. long, the lower bracts bright red; peduncle 6in. long. *l.* thirty to forty, densely rosulate from an ovate base, the blade 6in. to 9in. long, deeply channelled at the base. Central Mexico.

T. p. tricolor (three-coloured).* A robust variety, with a branched spike. 1877. (B. H. 1879, p. 162, t. 10-11, under name of *T. tricolor.*)

T. purpurascens (purplish). *fl.* unknown. *l.* deep purple, sheathing, oblong-lanceolate from a dilated base, mucronate at apex, the margins furnished with numerous, fine, closely-set teeth. Brazil, 1893. [Genus doubtful.]

T. regina imperialis (imperial). *fl.* unknown. *l.* forming a rosette 4½ft. in diameter, ascending, slightly recurved. Stem very strong. Brazil, 1888.

T. Reichenbachii (Reichenbach's). *fl.* solitary, terminal; sepals oblong, ½in. long; petal-blade obovate-cuneate; expanded corolla limb ¾in. in diameter; peduncle shorter than the leaves. October. *l.* few, spreading, densely rosulate, linear, acuminate, 4in. to 5in. long, ¼in. broad low down. Tucuman, before 1884.

T. Schlechtendahlii (Schlechtendahl's). *fl.*, calyx 1½in. long; petal-blades violet, as long as the calyx; spike dense, simple, 5in. to 6in. long, the bracts pink, 1½in. to 2in. long; peduncle much shorter than the leaves. *l.* lanceolate from an ovate base 2in. broad, the blade above 1ft. long, 1½in. broad, tinged with purple towards the base. Central Mexico, 1883. SYN. *Vriesia cæspitosa.*

T. sericea (silky). A garden synonym of *T. xiphioides.*

T. setacea (of Hooker) is a synonym of *T. compressa*, not *T. anceps.*

T. Siebertiana (Siebert's). A species having narrow, spiny leaves broadly margined with white. 1899.

T. tessellata parisiense (Parisian). A fine variety. 1895.

T. t. roseo-picta (rosy-painted). *l.* marked with large rosy spots. 1884.

T. t. Sanderæ (Mrs. Sander's).* *l.* prettily variegated with white and yellow bands on a tessellated green ground. Brazil, 1893. See Fig. 714.

T. t. Sanderiana (Sander's). *l.* more distinctly zoned and marbled than in the type. 1892.

T. tricolor (three-coloured) is a variety of *T. punctulata*, not a synonym of *T. anceps.*

T. umbellata is a form of *T. Hamaleana.*

T. variegata (variegated). *fl.*, calyx nearly as long as the bracts; petals lilac, convolute in a long tube; spikes about three, crowded, dense, distichous, 1½in. to 2in. long, the bracts greenish, 1in. long; peduncle 3in. to 4in. long. *l.* few in a rosette, the large, dilated, tightly-clasping bases variegated with green and brown; blade setaceous, flexuous, 1ft. long. Mexico, 1880.

T. vittata (striped). A garden synonym of *Cryptanthus bivittatus.*

T. xiphioides. *T. sericea* (of gardens) is identical with this.

T. x. Arequitæ.* *fl.* whiter and more numerous, and inflorescence longer, than in the type. *l.* larger and whiter. 1893. A fine variety. (R. H. 1893, p. 156.)

T. zebrina. This name is also applied in gardens to *Cryptanthus zonatus.*

T. zonata (zoned). A garden synonym of *Cryptanthus zonatus.*

Tillandsia—*continued.*

Hybrids.

A large number of hybrids have been raised in Continental gardens. A list of the best, with their parentage where known, is appended:

Alberti (*T. incurvata* and *T. Lindeni*, R. H. 1889, p. 300, f. 73). *Andreana* (*T. Barilleti* and *T. splendens* var.). *aurantiaca* (*T. Rex* and *T. Poelmani*). *Aurora* (*T. Lindeni* and *T. Warmingii*). *A. major* (*T. Warmingii* and *T. psittacina*). *Cappei* (*T. Van Geertii* and *T. cardinalis*). *cardinalis* (*T. carinata* and *T. psittacina Krameri*, I. H. 1891, t. 125). *Closoni* (*T. Barilleti* and *T. Lindeni*). *Crousscana* (*T. amethystina* and *T. Warmingii*). *Devansayana* (*T. carinata* and *T. Barilleti*). *Donneaiana* (*T. Barilleti* and *T. guttata*). *Duchartrei* (*T. Barilleti* and *T. splendens*). *Dufrichcana* (*T. Duvaliana* and *T. psittacina*). *Duvali* (*T. Lindeni* vars.). *elegans* (*T. Morreno-Barilleti* and *T. Duvaliana*). *Elmireana* (*T. cardinalis* and *T. splendens*). *fenestrato-fulgida* (as indicated). *fulgida* (I. H. 1888, t. 67). *furcata. gemma* (*T. Morreno-Barilleti* and *T. fulgida*). *gloriosa* (*T. Barilleti* and *T. incurvata*). *gracilis* (*T. Warmingii* and *T. amethystina*). *Gravisiana* (R. G. 1890, p. 494, f. 81). *Griesseniana. Henrici* (*T. splendida* and *T. splendens*). *hybrida* (R. G., t. 1392). *insignis* (*T. Barilleti* and *T. splendens*). *intermedia* (*T. fenestralis* and *T. Barilleti*). *Kiteliana* (R. G. 1890, p. 326, f. 62, 63). *Kramero-fulgida* (*T. psittacina Krameri* and *T. fulgida*). *leodiensis*

FIG. 714. TILLANDSIA TESSELLATA SANDERÆ.

(*T. Lindeni* and *T. Barilleti*). *Leopoldiana* (*T. splendens* and *T. Malzinei*). *Magnisiana* (*T. Barilleti* and *T. fenestralis*). *Marechaliana* (*T. incurvata* and *T. Morreni*). *Mariæ* (*T. Barilleti* and *T. carinata*, R. H. 1889, p. 300). *minima* (*T. psittacina Morreniana* and *T. Duvaliana*). *mirabilis* (*T. hieroglyphica* and *T. cardinalis*). *Morreno-Barilletiana* (*T. Barilleti* and *T. psittacina Morreniana*, I. H. 1889, t. 91). *Mortierii* (*T. corallina rosea* and *T. incurvata*). *Nanoti* (*T. fulgida* and *T. Morreni*). *obliqua* (R. G., t. 1369). *Peetersiana* (*T. guttata* and *T. Barilleti*, R. G. 1895, p. 456, f. 92). *Poelmani* (*T. splendens* and ?). *Pommer-Eschcana* (*T. Lindeni* and *T. splendens*, R. G., t. 1383). *psittacino-fulgida* (as indicated). *psittacino-picta* (*T. Morreni* and *T. Barilleti*). *psittacino-splendens* (as indicated). *retrofleza* (*T. psittacina* and *T. scalaris*). *Rex* (*T. Morreno-Barilletiana* and *T. cardinalis*). *rutilans* (*T. ensiformis* and *T. Kiteliana*). *Sanderiana* (*T. guttata* and *T. Wittmackiana*, R. G. 1897, p. 177, f. 51). *Sphinx* (*T. fenestralis* and *T. splendens*). *splendida* (*T. Duvaliana* and *T. incurvata*). *superba* (*T. Kiteliana* and *T. Rex major*). *Vassilierei* (*T. gloriosa* and *T. Rex*). *versaillensis* (I. H. 1879, p. 73, t. 87). *Vigeri* (*V. Rodigasiana* and *V. Rex*). *Weyringeriana* (*T. Barilleti* and *T. scalaris*, R. G. 1890, p. 7, f. 1). *Wioti. Wittmackiana* (*T. Barilleti* and another hybrid, I. H. 1889, t. 91; R. G., t. 1283).

TIMONIUS (from the Malayan name). SYNS. *Burnaya, Erithalis* (of Forster), *Eupyrena, Helospora, Polyphragmon, Pyrostria.* ORD. *Rubiaceæ.* A genus embracing about twenty species of stove shrubs or trees, natives of tropical Asia and Oceania. Flowers polygamo-dioecious, in axillary cymes. Leaves opposite. *T. Rumphii* has been introduced, but probably it is no longer in cultivation.

TISCHERIA. *See* **Rosa—Insects.**

TITHONIA. *T. excelsa* is a synonym of **Viguiera excelsa** (which *see*)

TOBACCO. As an insecticide this is still employed in the form of paper, rags, powder, as well as in a liquid state, but to nothing like the extent it was before the introduction of the various vaporising insecticides. (*See* **Fumigating.**) There is always some risk in fumigating with Tobacco-paper or rag, as the foliage of the plants must be dry, and the material must be very carefully watched to prevent it from breaking into a blaze on the hot coals. If this happens, serious damage is done to the occupants of the house being fumigated. The mode of operation is to place some bright coals or coke in a pot or other vessel with holes in the bottom, and on this the person fumigating keeps adding small quantities of Tobacco-paper or rag until the house is full of smoke; then the vessel is brought out. It is necessary that a still, quiet night be selected for the operation, otherwise the wind would blow much of the smoke out through the laps of the glass.

TOBACCO, MOUNTAIN. *See* **Arnica montana.**

TOBACCO, ROCK. *See* **Primulina Tabacum.**

TOBOLEWSKIA. A misprint in a garden periodical for **Sobolewskia** (which *see*).

TOCOCA. To the species described on p. 49, Vol. IV., the following should be added:

T. cinnamomea (Cinnamon-like). *fl.* red, ¼in. in diameter, thickly pedicellate; panicle long-pedunculate, few-flowered. *l.* 4in. to 6in. long, coriaceous, elliptic-oblong, acuminate, entire, dark-fuscous and highly glabrous above, beneath somewhat ferruginous, dotted; petioles ½in. to 1in. long. Brazil. A slender, almost twining tree.

T. platyphylla (broad-leaved). The correct name of *T.* (*Sphærogyne*) *latifolia.*

TODAROA. *Campylocentron Schiedei* is the correct name of *T. micrantha.*

TODEA. Crape Ferns. All Todeas require greenhouse treatment, and, with the exception of *T. barbara* and its variety, which do not suffer from exposure to air and light, all are much benefited by close confinement. Indeed, condensed moisture is absolutely necessary to their well-being, and this cannot be obtained without a close atmosphere. No sun should ever be allowed to shine on plants of the *Leptopteris* section, and the less they are disturbed at the roots, the better they fare: the hot, dry atmosphere of the summer months is undoubtedly their greatest enemy. The soil in which Todeas thrive best is a compost of peat and silver-sand, to which a small portion of partly-decomposed sphagnum may be added with advantage.

Todeas are easily propagated from their spores, which are produced in abundance and germinate readily when sown under favourable conditions; but they are of comparatively slow vegetation, and seedlings require a longer time than most other Ferns to form young plants.

As a decorative Fern, *T. barbara* has few equals, especially where plants are required for very small fancy vases. Good plants of it may be grown in comparatively small pots, and its lasting qualities are unsurpassed by any other known Fern grown for the decoration of the drawing-room, it being but little affected by smoke or gas.

To the species and varieties described on p. 50, Vol. IV., the following should be added:

T. arborea (tree-like). A garden name for *T. barbara.*

T. barbara bipinnatifida (twice-pinnatifid). A fine variety, having graceful divisions and incisions in the fronds. 1896.

T. b. Vromii (Vrom's).* *fronds* longer than in the type, less triangular, pale green, on shorter stipes, and furnished nearly to the base with longer and less distinctly-toothed pinnæ. Of quicker growth than the type.

T. grandipinnula (large-pinnuled). A synonym of *T. Moorei.*

T. intermedia (intermediate).* This robust garden form appears to be intermediate between *T. hymenophylloides* and *T. superba.* In size and cutting it is like the former; but the lower pinnæ are gradually reduced, as in *T. superba,* and their stipes are densely covered with short, woolly hairs. It reproduces true from seeds. 1877. (I. H. 1877, t. 290.)

T. Moorei (Moore's).* *fronds* thicker than in other species, broadly oblong, 1½ft. to 2ft. long (including the stipes), 1ft. broad; pinnæ overlapping, lanceolate, sessile, 1½in. to 2in. broad; pinnules sessile, lanceolate, closely set, cut nearly to the stalks into bluntish, ligulate lobes toothed on the outer edge. *sori* oblong, placed against the midrib near the base of the pinnules. Lord Howe's Island, 1886. A beautiful species. SYNS. *T. grandipinnula, Leptopteris Moorei.*

T. plumosa (feathery). A supposed hybrid, obtained from a sowing of *T. superba.* The surface of the fronds is moderately bristly with the small, erect segments, as in *T. intermedia,* but the fronds are shorter and more ovate, and the woolly character of the stipes is wanting. 1878. SYN. *Leptopteris plumosa.*

T. Vromii (Vrom's). A variety of *T. barbara.*

T. Wilkesiana (Wilkes').* This is now regarded as a species, and not as a variety of *T. Fraseri.* (G. C. June 11, 1870, p. 795, f. 148.)

TOFIELDIA. To the species described on p. 51, Vol. IV., the following should be added:

T. calyculata (calyculate). *fl.*, perianth greenish-yellow, ⅛in. long; raceme sub-spicate, ½in. to 3in. long, 4½in. to 6in. in diameter when expanded. *l.* 2in. to 6in. long, ¼in. to ½in. broad. Stem 6in. to 12in. high, with two or three reduced leaves. European mountains.

TOLPIS. Including *Æthonia.* SYNS. *Chatelania, Drepania. T. altissima* is the correct name of *T. virgata* (of Bertoloni), and *T. grandiflora* is a form of it.

TOMATO. With the exception of Leaf-Rust, all the chief diseases of the Tomato have already been described under their popular names of **Black Spot** or **Black Rot,** and **Sleeping Disease,** in the present Volume, and under **Tomato** in Vol. IV. *Cladosporium fulvum* proves very troublesome under glass, the upper surface of the leaves being spotted with dark brown, and the under surface with the rusty-brownish powdery substance that is so familiar. The fruits are less often attacked, and other parts of the plant have a discoloured appearance. All diseased plants should first be taken away and burned, and the remainder sprayed with liver of sulphur (1oz. to 3 gallons of water) at intervals of ten days or so.

INSECTS. The Snowy Fly (*Aleyrodes*), which has spread over the whole country, causing serious loss to the Tomato-grower, may be easily eradicated in houses heated with hot water. Immediately any of the Fly appears the hot-water pipes should be painted with sulphur mixed with milk. The milk will cause the sulphur to adhere better to the pipes, and if the pipes are kept moderately warm, and the house is closed for a week or two at night, this injurious and disfiguring insect will disappear.

SORTS. To the list of varieties given on page 53, Vol. IV., the following should be added:

Chemin Rouge. Fruit red, deep round, smooth, medium, and even in size. Plant very compact and extremely productive. One of the most prolific varieties, and a great favourite with market growers.

Comet. Fruit bright red, medium, smooth, averaging eight fruits to a cluster. A compact-growing and very prolific variety. One of the best.

Conference. Fruit red, smooth, rather small, freely produced in good clusters. Early.

Duke of York. Fruit very deep red, large, smooth, handsome, and moderate cropper. One of the best for exhibition.

Early Ruby. Fruit red, slightly corrugated, plant dwarf, compact. A great bearer, and remarkably prolific outside.

Frogmore Selected. Fruit red, large, sometimes slightly corrugated. Very productive, and suited alike for inside or outside culture.

Golden Jubilee. Fruit golden flushed with a red tinge, smooth, large, and very handsome. Plant compact and abundant bearer. A new variety raised in the Royal Gardens, Windsor.

Golden Nugget. Fruit bright yellow, small, smooth, very handsome, borne in large clusters. Plants very prolific. The best-flavoured dessert variety.

Perfection. Fruit deep red, smooth, handsome. Plant a moderate bearer. An excellent exhibition variety.

Ponderosa. Fruit pale red, corrugated, and coarse. The largest-fruited variety.

Semper Fructifera. Fruit bright red, pear-shaped, smooth, borne in immense clusters, often having sixty fruits in each cluster, quality good. A great bearer. Only suitable for dessert.

Young's Eclipse. Fruit red, smooth, round, handsome, and of fine quality. Plant dwarf and very prolific. A promising new variety.

TOMATO GALL. *See* **Vine Galls.**

TONGUE VIOLET. *See* **Schweiggeria paucifiora.**

TOOLS, IMPLEMENTS, &c. To the list on pp. 53-7, Vol. IV., the following may be added:

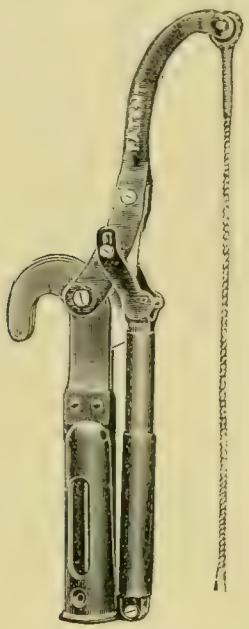


FIG. 715. AERIAL AUTOMATIC TREE-PRUNER.

Aerial Automatic Tree-Pruner. This is an improvement on the Averruncator, described in Vol. IV., page 53, being lighter, more easily worked, and, what is of more importance to the good pruner, the cuts are clean and well made. The mode of its working is well described on the page referred to. See Fig. 715.

Aerial Pruning Saw. It frequently occurs that branches are too thick for the Tree-Pruners named to cut: therefore it is always advisable to purchase this Saw as well. By its means branches as thick as the ankle are easily cut through, without climbing into the tree. The teeth facing the operator cause the Saw to be drawn towards the pruner, making the work easy; it also avoids bruising of the tree, as so frequently is done when the saw is pushed.

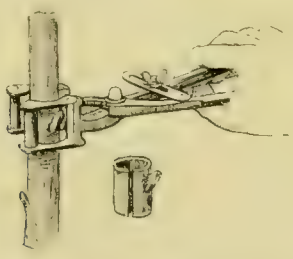


FIG. 716. BUD-REMOVING TOOL.

Bud-removing Tool. One of the difficulties that confronts gardeners from time to time is the clean removal of buds for inserting in other plants. This is now removed by an invention of an American, Mr. Duncan Galbraith, of New Orleans. The tool is shown in the accompanying illustration, for which, as well as for the matter describing it, we are indebted to the "Scientific American." According to that, the tool consists of two pivoted levers, or handles, each having a cross-head upon

Tools, Implements, &c.—*continued.*

one end. To each cross-head a pair of blades is screwed formed with concave cutting-edges, so that when the handles are brought together only the top and bottom portions will touch. The space between the blades is open, so that the bud cannot be injured. The pairs of blades, constituting jaws in effect, are held in adjusted positions by a link which is pivoted to one handle, and which is made to receive a set-screw carried by the other handle. The jaws are fitted to the exterior of the limb, twig, or branch, the bud being midway between the pairs of jaws. After the blades have been closed firmly around the branch, and locked in adjusted position, the tool is turned so as to cut a sleeve or ring of bark from the branch, as shown in the illustration. See Fig. 716. The limb to which the bud is to be transplanted has a section of its bark removed by a similar tool, the space thus formed corresponding in length with the sleeve of bark carrying the bud to be transplanted.

FIG. 717. IDEAL FRUIT-PICKER AND BRANCH-PRUNER.

Ideal Fruit-Picker and Branch-Pruner. The value of this implement for gathering fruit in positions awkward to get at is so great that it is almost indispensable where tall trees are grown in any quantity. As will be seen in the illustration (Fig. 717), the operator severs the fruit from the branch, and it falls into the net immediately

Tools, Implements, &c.—*continued.*

below; it is thus safely secured in an unbruised condition, and without any bruising or breaking of branches, which would occur by placing ladders against the trees to gather the fruit. The net is easily attached to, or removed from the implement, and without the net it is most useful for pruning tall trees or branches difficult to reach. The implement is light, handy, and easy to work.

FIG. 717. CHAMPION LAWN WEEDER

Lawn Weeder. Under the name of the Champion Lawn Weeder is found an ingenious little tool that should save the gardener much labour. As may be seen from Fig. 718, it consists of a pair of sharp, chisel-pointed tongs, or fingers, mounted on long handles. These latter enable the gardener to work without stooping. The operation is simplicity itself: the appliance is pressed down on each side of a weed, which is then gripped below the ground and extracted by the roots. But a very small hole is made, and if it be used after a shower, when the soil is moist, it should prove a most effective tool.

"*Myticuttah.*" For pruning low-growing trees or shrubs, this is a very useful appliance, and is made in various sizes to suit different requirements, the largest size cutting wood over an inch in diameter. For root-pruning it is also excellent, as it makes clean cuts, and the whole of the roots are cut rapidly without covering the operator with soil, as when the work is performed with a knife or a small saw. For pruning Gooseberry-bushes or prickly trees, this is a very good appliance, as the work may be done without any risk of injury to the hands. See Fig. 719.

Pattisson Lawn Boot. Where horses are employed for working upon lawns, the Pattisson Boot will be found much superior to the old form. It is of simple construction, as may be seen by Fig. 720, light, and strong. The soles are made of English sole-leather and india-rubber, and are so affixed to the steel foundation-plate that they cannot get out of shape however much exposed to wet. As well as being durable, the soles may be renewed, thus economising considerably. Another point is that they are readily put on and kept in position by means of the heel-screw shown. Thus they cannot slip round, as is the case with the ordinary boot; while the horse is also benefited, as instead of the frog and the fetlock being kept in an unventilated receptacle, they are quite open to the air. Those who prefer a leather fastening to the screw adjustment can have one that is

Tools, Implements, &c.—*continued.*

adapted to either shod or unshod horses. Yet another point in favour of the Pattisson Boot is the fact that it is adjustable to different-sized feet. Where there are large stretches of turf to be mowed and rolled by horse aid this Lawn Boot will be found of great utility.

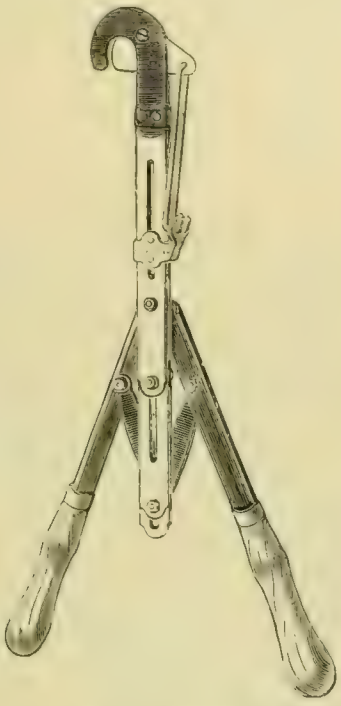


FIG. 719. "MYTICUTTAH."

Soil-Stirrer. The name of Aerator has been given to a tool designed to largely supersede the hoe as a surface tiller. The tool consists of a central fork with its arms set at such angles as will give to the two revolving interlocked bosses a sideway or dragging motion. Each boss is provided with four steel tines curved to a given radius, and the whole is mounted upon a strong handle. The tool is of undoubted value, and this value might be still further increased by slight structural modifications, such as the prevention of clogging at the bosses in the case of stiff soils, the strengthening of the boss arms, and by making the parts on which there is strain interchangeable. See Fig. 721.

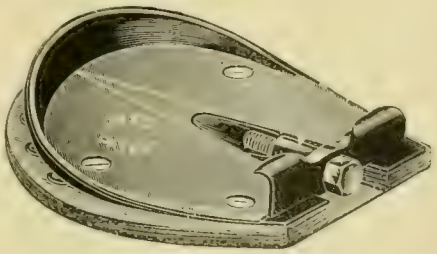


FIG. 720. PATTISSON LAWN BOOT.

Turf-Renovator (Pattisson's). For repairing lawns, tennis-courts, and stretches of Grass generally, this useful appliance has been invented. The Turf-Renovator not only cuts out weedy or bare patches, but replaces

Tools, Implements, &c.—*continued.*

them with pieces of good turf of exactly similar size. Compared with the ordinary method of turf-repair the work is simplicity itself. The tool consists of a cylindrical cutter affixed to a stout handle. The knives are at the lower end of the cylinder, and they cut both clearly and well. Inside the cylinder is an unloader, which preserves intact the sod of good Grass to be utilised in the repair. By the aid of this Renovator it is possible to cut through turf from 2¾in. to 3in. in thickness. It is made in several sizes, 8½in. diameter, 10in., and 12in.

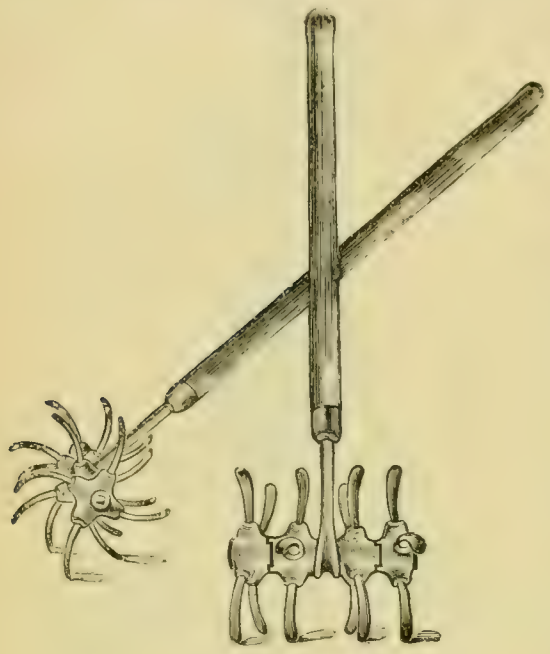


FIG. 721. SOIL-STIRRER.

Weeding Fork. One of the latest forks designed for weeding is the Gnu, invented by Corry and Co. It has five strong, tapering tines placed close together, and the whole is affixed to a handle 3½ft. in length. The operator can, therefore, with a minimum expenditure of energy execute a maximum amount of work.

TOPDRESSING. The addition of fresh soil, or chemical or natural manures on the surface to plants or trees, is known as Topdressing. It is one of the best modes of maintaining them in good health and condition, as it not only supplies plant-food, but encourages the multiplication of surface-roots, which receive the benefit of solar influences, reaching beneficially on the plant or tree. Further, the manure is easily applied, and assists in conserving moisture.

TORENIA. To the species, &c., described on p. 59, Vol. IV., the following should be added:

T. exappendiculata (having no appendage). A synonym of *T. pedunculariis.* (R. G., t. 892.)

T. Fournieri compacta (compact). This differs from the type in its dwarfer and more compact habit. (R. G. 1887, p. 667, f. 172.) There are also several garden forms that are likely to commend themselves — *grandiflora*, light blue, with purple blotches and yellow spots; PRINCESS HELENE, light blue, with darker spots; and WHITE WINGS, white, with rose suffusions and yellow throat.

T. hirsuta. According to the "Index Kewensis," this is a distinct species and not a variety of *T. asiatica.*

TORTOISESHELL BUTTERFLY. *See* **Pear—Insects, and Vanessa.**

TORTRIX VIRIDANA. *See* **Oak-Leaf Roller Moth.**

TOURNEFORTIA. To the species described on p. 62, Vol. IV., the following should be added:

T. cordifolia (cordate-leaved). *fl.* white, small, in large, terminal, corymbose cymes. *l.* opposite, 1ft. long, cordate, acute; petioles 3in. to 4in. long. Tropical America, 1887. A greenhouse or half-hardy shrub, of bold habit, clothed with short hairs. (R. H. 1887, p. 128, f. 26-7.)

T. heliotropioides. The correct name is *Heliotropium anchusæfolium.*

TOURRETIA. *T. volubilis* is the correct name of *T. lappacea.*

TOWN GARDENING. An interesting, but little understood phase of Horticulture. In a Town Garden, usually the chief causes of failure are large shade trees, sour and poor soil, and unfortunate selection of species and varieties. Perhaps the greatest mistakes occur in trees and shrubs, especially in the Evergreen Section. With these the rule to remember is never to plant subjects whose foliage has a holding surface. The best kinds are those that have a glossy surface, from which the impurities incidental to towns are dislodged by a moderate shower or by the use of the garden syringe or the hose. It cannot be too clearly laid down that anything that clogs the breathing pores of the leaves is inimical to plant-life. Aucubas, Barberries, *Quercus Ilex*, *Cratægus Pyracantha* and other Thorns, Privet, Laurustinus, Cotoneasters, Box, Laurels, Euonymus, *Olearia Haastii*, *Osmanthus*, and Phillyreas, are all good evergreens for towns. Deciduous kinds are more numerous, and embrace Planes, Flowering Currants (Ribes), *Laburnum*, *Syringa*, *Amygdalus*, *Ailantus*, *Cytisus*, Spiræas, Weigelas, Guelder Rose, Limes, *Cornus*, *Forsythia*, Sycamore, *Hibiscus*, Poplar, and Virginian Creeper. Of hardy bulbous subjects there is no lack, while Michaelmas Daisies, Phloxes, Carnations, Chrysanthemums, Flag Irises, and Pæonies are amongst the best that fall under the heading of flowering subjects that may be considered hardy.

TOWNSENDIA (named in honour of David Townsend, botanical associate of Dr. Darlington, of Pennsylvania). ORD. *Compositæ.* A genus embracing about sixteen species of hardy, depressed or low, many-stemmed herbs, found on the Rocky Mountains. Flower-heads comparatively large, resembling those of *Aster*; rays varying from violet or rose-purple to white, numerous; achenes commonly beset with bristly, duplex hairs; involucral bracts mostly ciliated. Leaves linear to spathulate, entire. Only one species calls for description here. For culture, *see* **Perennials.**

T. Wilcoxiana (Wilcox's). *fl.-heads* rosy-purple, mostly solitary, sometimes 1in. long, shortly pedunculate or sub-sessile; involucre well imbricated. Early spring to summer. *l.* linear-spathulate, 1in. to 3in. long including the petiole-like base. Colorado, &c.

TOXICOPHLÆA. The correct name is *Acokanthera.*

TRACHELOSPERMUM. *T. jasminoides variegatum* has the leaves variegated with white, but it is not so vigorous as the type.

TRACHYCARPUS. *T. Griffithii* (R. H. 1879, p. 212. f. 43) and *T. khasyanus* are now regarded as synonyms of *T. Martiana.* *T. khasyanus* (B. M. 7128) has been grown for many years under the names *T. Griffithii*, *Chamærops Griffithii*, and *C. Martiana.*

TRADESCANTIA. To the species described on p. 65, Vol. IV., the following should be added. All require stove treatment.

T. congesta (congested). *fl.* light blue. July and August. *h.* 2ft. North America.

T. decora (comely).* *l.* elongated, lanceolate, dark olive-green, with a median band of silvery-grey. Brazil, 1892.

T. dilecta (beloved). *l.* dark green with greenish-white stripes on the upper surface, dark purplish-violet beneath. Stalks cylindric, green, blotched with dark purple. Habitat not recorded, 1897.

T. elongata (elongated). *fl.* small, in rather dense umbels; petals pink; peduncles one to five, terminal, ¾in. to 3in. long. *l.* 3in. long, lanceolate or oblong-lanceolate, dark green, with bands of silvery-white, and a dull purple tinge down the midrib. Stem procumbent, at length sub-erect, 1ft. to 2ft. high, slightly branched. Tropical America, 1892.

Tradescantia—*continued.*

T. Martensiana (Martens'). A synonym of *Callisia Martensiana*.

T. multicolor (many-coloured). A garden name for a form of *Zebrina pendula*.

T. Reginæ (The Queen's). *l.* distichous, lanceolate, acuminate, 6in. long, whitish-green, with the central part and margins transversely veined with dark green, and washed with purple along the midrib; under-surface purple. Stems erect. Peru, 1892. (G. C. 1892, xi., p. 696, f. 102; I. H. 1892, t. 147.)

T. superba (superb).* *l.* ovate-oblong, acute, dark green, with a whitish stripe on each side of the midrib; under-side purple. Peru, 1892. (I. H. 1892, t. 155.)

T. tricolor (three-coloured). A garden name for *Zebrina pendula*.

T. virginiana (Virginian). The correct name of *T. virginica*. There are many fine varieties, some of them of garden origin, the best being a double and a single blue, a double and a single carmine, and a soft pink.

TRAGOPOGON. *T. crocifolius* is the correct name of *T.* (*Geropogon*) *glaber*, and *T. dubius* is the proper name of *T. major*.

TRAGOPYRON. Included under **Atraphaxis** (which *see*).

TRAILING. Long and prostrate, but not rooting.

TRAMA AURICULÆ. *See* **Auricula—Insect Pests.**

TREASURE FLOWER. *See* **Gazania.**

TREE CARROT. *See* **Thapsia edulis.**

TREE CELANDINE. *See* **Bocconia frutescens.**

TREE ONIONS. *See* **Onion.**

TREE-ROOT ROT. *See* **Agaricus** and **Honey Agaric.**

TREES AND SHRUBS. The Tree- and Shrub-life of foreign climes has adorned our gardens ever since travellers began to send over things which they considered worthy of use here. Japan, China, New Zealand, the Himalayas, and other temperate lands contribute Trees which rank amongst the most beautiful objects of the garden and park, and some of them are becoming so familiar that we are almost led to believe they are indigenous. We cherish Trees, too, for their varied forms. Some are erect, as the Lombardy Poplar; others are like the spreading Oak and the purple-leaved Beech; while the Willow touches the water's surface with its slender branches: a delightful variety indeed, and indispensable in the well-planted garden.

A hundred Shrubs also are at hand to embellish the English garden: Shrubs of beauty in some form, whether it be their flowers in spring and summer, or their foliage in autumn, when Nature paints them with crimson, brown, yellow, and other rich tints. We may select from among the ornamental Plums, Deutzias, Mock Oranges, the sea-loving Escallonias, Cytisus, Berberis, Diervillas, Olearias, Spiræas, Kalmias, Azaleas, and many others; but variety is useless if good taste is wanting. A common shrubbery is usually a place in which beautiful things are crowded together without reason, throttling each other in their endeavours to reveal their true characters. The cultivator's aim should be to let everything in the garden tell its own tale, and he should never forget that in bold grouping the most artistic picture is secured. It is colour-effect that the planter should most think of, avoiding unpleasant contrasts. We have often wondered that the majority of gardeners and others have never dipped more deeply into the rich store-house of Trees and Shrubs, but have confined themselves to a few kinds, which one wearies of because so frequently repeated. One misses the variety that a good selection gives, not only in form, but also in colouring, from the silvery-grey of the Willow, through shades of green, to even the deepest purple; while, in the form of the leaf, we see the same wonderful range.

Amongst deciduous kinds for winter effect we would specially mention the yellow-stemmed Willows and Ash, the red-barked Cornus, Willow, and Berberis, the silver-barked Birch, Rubus (Bramble), and in a less degree the silvery Poplar and the native Sea Buckthorn. The Alders, Willows, and Nuts are also effective because

Trees and Shrubs—*continued.*

of the freedom with which their elegant catkins are borne on the leafless branches.

Of Trees and Shrubs that blossom during the winter the following are specially meritorious: A good-sized plant of *Chimonanthus fragrans* (Winter Sweet), with its deliciously-scented blossoms, is always welcome in December; while the elegant and pendulous catkins of *Garrya elliptica*, borne at the tips of the evergreen shoots, the fragrant *Lonicera Standishii*, *Arbutus* (Strawberry Tree) of sorts, and the naked-flowered Jasmine (*Jasminum nudiflorum*) are of great value at this season. The deciduous Daphne (*D. Mezereum*), with its white- and pink-flowered varieties, *Hamamelis arborea* (Japanese Witch Hazel), *Viburnum Tinus* (Laurustinus), the white- and pink-blossomed Heaths (*Erica carnea* and *E. c. alba*), as well as *Berberis japonica*, are too precious to pass by unnoticed. These are followed by a couple of exceptionally

FIG. 722. PRUNUS (CERASUS) PSEUDO-CERASUS.

free-flowering Rhododendrons, viz., *R. dauricum* and *R. præcox*. *Prunus* (*Persica*) *Davidiana*, one of the most charming of early spring-flowering trees, is generally in blossom about the middle of February. Although not showy, the clusters of small yellow flowers of *Cornus mas* (Cornelian Cherry) are effective, especially if a suitable background of evergreen Shrubs is afforded.

Amongst spring-flowering Trees and Shrubs are many gems suitable for decorative planting—Forsythias, Pieris (Andromeda), *Nuttallia cerasiformis*, Pyruses, Magnolias (deciduous), the fragrant *Corylopsis spicata*, Almonds, Peaches, Cherries, Plums, Thorns, and Amelanchiers are a few of the spring-flowering treasures.

Some Trees and Shrubs are conspicuous for the splendid colours assumed by the leaves before they fall off, and in this respect *Quercus coccinea* (Scarlet Oak), *Q. conferta*, *Q. rubra*, Azaleas, *Acer rubrum*, *A. circinatum*, *A. palmatum* varieties, *Rhus typhina*, *R. cotinus*, *R. glabra*, *Berberis Thunbergi*, *B. vulgaris*, *Euonymus atropur-*

Trees and Shrubs—*continued.*

pureus, Viburnum, Amelanchier canadensis, Cratægus punctata, C. prunifolia, C. coccinea, Liquidambar styraciflua, Parrotia persica, Cornus alba, C. florida, Styrax obassia, Pyrus torminalis, Liriodendron tulipifera, and *Vitis* (including *Ampelopsis*) of sorts, are a few of the most striking.

One of the most delightful groups of hardy Trees and Shrubs may be composed of berry-bearing kinds, and planters would do well to introduce these more freely into pleasure-grounds, parks, &c.

PLANTING. The subject of planting or transplanting is of great importance to those having anything to do with the cultivation of hardy Trees and Shrubs, as the success or failure depends in a large degree on the way in which such details are carried out. It should not be forgotten that if a Tree or Shrub is worth planting, it should be carefully treated. Ground for the reception of ornamental Trees should be properly drained, if not naturally so, and trenched. It must, however, be remembered that Trees and Shrubs differ as regards the kind of soil most suitable for them. Some are naturally deep-rooting, and others, like the Heath family and its allies, may be taken as examples of surface- or shallow-rooting subjects. Such Shrubs as the deciduous Daphnes are best planted as quickly as possible after the fall of the leaf in autumn, as root-action commences soon after Christmas, which would be interfered with if planting were deferred until spring.

Opinions differ greatly as to the best time to transplant Trees and Shrubs. Some prefer early autumn, some March, and others April and May. We believe, however, in autumn planting, as then the temperature of the ground is higher than is the case either in mid-winter or in early spring, and the Trees are enabled to make fresh roots and establish themselves in their new quarters before winter. Besides, they are better able to commence growth in spring without feeling ill effects. Any time between September and March will do so long as the Trees are in a condition to be lifted, ordinary care is taken in the operation, and provided, of course, that the ground is in a proper state to receive them.

Planting in dry, windy weather is not advisable, as evaporation then goes on much more rapidly than is the case when the weather is mild and dull. It will therefore be seen that the conditions most favourable for planting are when the atmosphere is damp or moist. It is not a good practice to transplant in mid-winter, as the ground at that period is very cold. Neither should transplanting be done or attempted in frosty weather.

With regard to seedlings that have been growing in seed-beds, or autumn-rooted cuttings, spring will be found the best time for planting these out in nursery rows in soil suited to their requirements. Until well established they should be watered daily.

Evergreens, especially Hollies, Yews, Bays, Portugal Laurels, &c., may be transplanted with safety in April and May. They should always be lifted with good balls of earth, and the roots interfered with as little as possible; but they should never be exposed to drying winds, which injure the small fibrous rootlets. They should not be kept out of the ground longer than is really necessary, and if any of the roots should get bruised, the injured parts should be cut away at once, because if allowed to remain they might decay and be the means of causing others to die; if a sharp knife be used in cutting the roots, the damaged parts will soon heal over.

In the case of Trees that are required to travel long

FIG. 723. CHIONANTHUS RETUSUS.

Trees and Shrubs—*continued.*

distances, the roots should always be protected from dry, parching winds by means of mats, tiffany, hay, or any such material. Holes for their reception should have been previously prepared, and be larger than the ball of

FIG. 724. CLETHRA ALNIFOLIA.

earth attached to the roots, which latter should be spread out carefully in all directions, so that they will be in a position to take up nourishment from all sides; besides, by fixing the Trees more securely in the soil, they are better able to withstand boisterous winds. The soil at the base should be loosened, and the distance between the Trees will depend on the size, kind, and object for which they are intended. It sometimes happens that the ordinary soil of the garden is not suited to certain kinds of Shrubs, in which case the indifferent soil should be taken away and replaced by some favourable to the well-being of the subjects it is intended to plant. The common mistake of huddling the roots up together should be avoided, and the disadvantages of very deep planting cannot be too strongly condemned. Manure in any shape should never be placed in immediate contact with the roots, as it will do more harm than good; it should be incorporated with the soil.

The importance of regular transplanting Trees in a young state, especially such as belong to the Fir tribe, does not seem to be sufficiently understood, or is not carried out to the extent it should be. It frequently happens that Trees get too big or bulky for certain positions, and it becomes necessary to lift some of them, in order to give those that are left more room to develop. If transplanting has not been properly attended to in the early stages, the chance of successfully moving them is considerably minimised unless extra care is taken in the operation.

Trees that are "mop-headed," or top-heavy, should be supported by stakes and securely tied immediately planting is completed, so as to prevent them from being blown over in windy weather. It is wise, especially if planting be done in the spring, to give a good watering to consolidate the soil about the roots, and if water is applied to the foliage by means of a garden-engine or a syringe, the Trees will be greatly assisted in making fresh roots. In the case of Trees that are impatient of disturbance at the root, it is an excellent plan to mulch after transplanting with decaying leaves, light litter, &c.; these not only protect the ground from frost, but prevent the escape of heat and moisture.

Shrubs grown in pots are not a success, as a rule, for the reason that the roots are matted together through

Trees and Shrubs—*continued.*

too close confinement. We have noticed how much more vigorous are Shrubs lifted from the open than those turned out of pots, except in the case of delicate kinds that need protection in early life; but such as these should never be planted in the open air unless the situation is peculiarly favourable. Planting from pots may be carried out at almost any season, but that is the only advantage, and this is not a practice for general recommendation.

PRUNING. This is an all-important subject, yet one unfortunately both little understood and neglected. To properly prune the various Trees and Shrubs several points must be considered, such as habit, health, and purpose for which they are intended; also if the flowers are produced on the previous or current year's growth. Site and soil are also important.

In borders that are planted with mixed Shrubs pruning is essential to keep the too vigorous growth within bounds, and to both protect and encourage weaker kinds. The shrubbery border should be examined at least twice a year, and not allowed to remain unattended for protracted periods.

In pruning flowering Shrubs the object should be to improve their general appearance and to encourage greater freedom in blossom. To accomplish the latter, one must sometimes sacrifice growth, especially if the Shrubs have been neglected in the early stages, as, like fruit trees, they should be carefully attended to whilst young, when it is easy to lay in a good foundation. Old worn-out, sickly, and useless wood should be removed, and young vigorous shoots encouraged.

The subject may very well be discussed under two heads: (1) spring pruning, and (2) summer pruning. The point that troubles many lovers of hardy Shrubs is to distinguish between the two sections. Roughly speaking, Shrubs whose flowers are produced in winter or spring should be pruned immediately the flowers are over, so that they may be encouraged to make new wood early and thus become matured before winter.

The charming Winter Sweet (*Chimonanthus fragrans*) is a typical example of a winter-flowering Shrub. In February the flowering wood should be cut back to an eye of the old wood, and the worn-out growths removed altogether. *Garrya elliptica* should be pruned in early spring, the object being to encourage vigorous growths, which, if properly ripened, will flower freely. Of Honeysuckles, *Lonicera fragrantissima* and *L. Standishii* should have their old wood thinned out in March. The Winter Jasmine (*Jasminum nudiflorum*) should be attended to about the same time, and if the plant be growing against a wall the main shoots should be secured thereto, and the smaller growths allowed freedom: its effect when in blossom is much prettier than when all the shoots are nailed to the wall.

Portugal Laurels are best pruned in April, and the Holly in March or August, as there is time for the wounds to heal before growth ceases. With *Forsythia suspensa* the weak growths should be cut away, and the strong shoots shortened as soon as the blossoming period is over, as shoots 6ft. in length will result, and carry flowers freely the following spring. The evergreen *Cratægus Pyracantha* should have its weak growths thinned out in early spring, and vigorous growths from the base laid in to take the place of the old shoots. Clusters of berries will thus be borne at the bottom, as well as at the top of the plant. In the early summer the overcrowded shoots of *Olearia Haastii* should be thinned out, and Mahonias (Barberries) may be treated in the same way at the same time. Rhododendrons do not as a rule require much pruning beyond a thinning out of the overcrowded delicate shoots after flowering is over. The seed-pods should always be removed unless seed is required.

As the flowers of *Cydonia japonica* are borne on short spurs along the old wood in March and April, pruning must be done when necessary in the last-named month, and only the very old wood should be taken away, as a too free use of the knife with this early-flowering Shrub

Trees and Shrubs—*continued.*

robs it of much of its beauty. Deutzias, Cytisus, Genistas, Spiræas, Escallonias, Philadelphus, Ribes (Flowering Currants), Syringas, Loniceras, Wistarias, Viburnums, &c., should have their vigorous shoots shortened, and delicate growths removed after flowering. The knife should be used sparingly with such things

FIG. 725. ENKIANTHUS CAMPANULATUS.

as Kalmias, Pieris (Andromeda), Vacciniums, Azaleas, Ledums, &c. The majority of the evergreen ornamental Shrubs are best pruned in summer.

Clematises need special attention, as the flowers are produced upon different kinds of wood. The herbaceous sorts, such as *C. diversifolia*, *C. recta*, and *C. Davidiana*, should be cut down to the ground in autumn, while those belonging to the *Viticella* and *Jackmanni* sections are best pruned to within 9in. of the soil in November. The *Lanuginosa*, *Montana*, and *Florida* types flower from June to October, and these should be pruned in February, removing the whole of the weak, overcrowded shoots, and a part of the old flowering wood.

Certain Shrubs are improved by close pruning. *Paulownia imperialis* is a case in point. If the whole of the wood be cut down in the autumn to a few eyes, strong shoots will be thrown up in spring, the most vigorous of which should be selected and the others removed. Treated thus, *P. imperialis* makes a good lawn Shrub, planted either singly or in a group. The Golden-leaved Elder is much improved by severe pruning, as its young shoots are of a richer yellow than when left unpruned. Willows, Amorphas, Colutcas (Bladder Sennas), &c., may be kept within bounds by a free use of the knife. The Stag's Horn (*Rhus typhina*) bears pruning well, and if compact plants are desired close pruning is necessary. *Hydrangea paniculata hortensis* (*H. p. grandiflora*) should be pruned in February, and the

Trees and Shrubs—*continued.*

whole of the previous year's wood cut back to a single eye, as hard pruning is essential if large, well-formed panicles of flowers are desired in autumn. With regard to most of the other Hydrangeas, a thinning out of the shoots will be ample.

Conifers should not be pruned in winter; the best time is spring or summer, as the Trees being then in growth the wounds quickly heal. Conifers generally, however, require very little pruning. The Larch and Pine families are, for instance, apt to bleed freely if pruned when in full growth. Conifers should be moulded into shape when young. Such Trees as *Cedrus Deodara*, *C. Libani*, and *Tsuga canadensis* (*Abies canadensis*) frequently throw up delicate, pendulous leaders, and are apt to become flat-headed unless the side-growths are shortened when young, and more strength thrown into the principal leader. *See also* **Shrubberies and Shrubs**, and **Transplanting.**

FIG. 726. STUARTIA PSEUDO-CAMELLIA.

Deciduous Trees and Shrubs.

Abelia
Acanthopanax
Acer
Æsculus
Ailantus
Alnus
Amelanchier
Amorpha
Aralia
Azalea
Berberis
Betula
Cæsalpinia
Calophaca
Calycanthus
Caragana
Carpinus
Carya
Caryopteris
Castanea
Catalpa
Cercis
Chionanthus (Fig. 723)
Clematis
Clerodendron
Clethra (Fig. 724)
Colutea
Cornus
Corylus
Cotoneaster
Crataegus
Cytisus
Daphne
Deutzia
Diervilla
Enkianthus (Fig. 725)
Eucryphia
Euonymus
Exochorda
Fagus
Forsythia
Fothergilla
Fraxinus
Fuchsia
Gaylussacia
Genista
Gleditschia
Gymnocladus
Halesia

Trees and Shrubs—*continued.*

Deciduous Trees and Shrubs—*continued.*

Halimodendron	*Magnolia*	*Ribes*
Hamamelis	*Neillia*	*Robinia*
Hedysarum	*Nuttallia*	*Rubus*
Hibiscus	*Nyssa*	*Salix*
Hydrangea	*Oxydendron*	*Sambucus*
Hypericum	*Paeonia*	*Shepherdia*
Idesia	*Parrotia*	*Spartium*
Itea	*Paulownia*	*Spiræa*
Jamesia	*Philadelphus*	*Stachyurus*
Juglans	*Platanus*	*Staphylea*
Kerria	*Populus*	*Stuartia* (Fig. 726)
Laburnum	*Prunus* (Fig. 722)	*Styrax*
Lespedeza	*Ptelia*	*Syringa*
Leycesteria	*Pterocarya*	*Tilia*
Liquidambar	*Pyrus*	*Ulmus*
Liriodendron	*Quercus*	*Vaccinium*
Lonicera	*Rhododendron*	*Viburnum*
Loropetalum	*Rhodotypos*	*Zenobia*
Lyonia	*Rhus*	

Evergreen Trees and Shrubs.

Andromeda	*Elæagnus*	*Pernettya*
Arbutus	*Empetrum*	*Philesia*
Arundinaria	*Erica*	*Phillyrea*
Arundo	*Eriobotrya*	*Phlomis*
Aucuba	*Escallonia*	*Phyllostachys*
Azara	*Eucalyptus*	*Pieris*
Bambusa	*Eurybia*	*Piptanthus*
Berberis	*Fabiana*	*Polygala*
Bruckenthalia	*Gaultheria*	*Quercus*
Bryanthus	*Griselinia*	*Rhamnus*
Buddleia	*Helianthemum*	*Rhaphiolepis*
Buxus	*Hymenanthera*	*Rhododendron*
Cassandra	*Hypericum*	*Rosmarinus*
Cassinia	*Ilex*	*Ruscus*
Castanopsis	*Kalmia*	*Skimmia*
Cerasus	*Laurus*	*Tamarix*
Choisya	*Ledum*	*Trachycarpus*
Cistus	*Leiophyllum*	*Ulex*
Cotoneaster	*Leucothoë*	*Vaccinium*
Crataegus	*Ligustrum*	*Veronica*
Dabœcia	*Olearia*	*Viburnum*
Daphne	*Osmanthus*	*Vinca*
Daphniphyllum	*Ozothamnus*	*Yucca*

Berry-Bearing Trees and Shrubs.

EVERGREEN.

Arbutus	*Gaultheria*	*Phillyrea*
Aucuba	*Hedera*	*Rhaphiolepis*
Azara	*Hymenanthera*	*Ruscus*
Berberis	*Pernettya*	*Skimmia*
Cotoneaster		

DECIDUOUS.

Berberis	*Elæagnus*	*Sambucus*
Celastrus	*Euonymus*	*Symphoricarpus*
Cotoneaster	*Hippophæ*	*Viburnum*
Crataegus	*Lycium*	*Vitis*
Daphne	*Pyrus*	

Wall Shrubs and Climbers.

DECIDUOUS.

Abelia	*Exochorda*	*Periploca*
Actinidia	*Fremontia*	*Plagianthus*
Ampelopsis	*Indigofera*	*Prunus*
Aristolochia	*Jasmine*	*Pyrus*
Bignonia	*Lippia*	*Viticella*
Chimonanthus	*Lonicera*	*Vitis*
Clematis	*Lycium*	*Wistaria*
Corchorus	*Menispermum*	*Xanthoceras*
Corylopsis		

EVERGREEN.

Akebia	*Elæagnus*	*Myrtus*
Aristotelia	*Escallonia*	*Olearia*
Benthamia	*Euonymus*	*Osmanthus*
Berberidopsis	*Eurya*	*Passiflora*
Bridgesia	*Garrya*	*Photinia*
Carpenteria	*Hedera*	*Pittosporum*
Ceanothus	*Holboellia*	*Rhaphiolepis*
Crataegus	*Lonicera*	*Smilax*
Desfontainea	*Magnolia*	

Trees and Shrubs—*continued.*

Weeping Trees and Shrubs.

DECIDUOUS.

Acer	*Fagus*	*Prunus*
Alnus	*Fraxinus*	*Salix*
Betula	*Laburnum*	*Sophora*
Caragana	*Larix*	*Tilia*
Cornus	*Populus*	*Ulmus*

EVERGREEN.

Cedrus	*Juniperus*	*Taxus*
Cupressus	*Picea*	*Thuya* (*Biota*)
Ilex		

Conifers.

Abies	*Ginkgo*	*Pseudotsuga*
Araucaria	*Juniperus*	*Retinospora*
Biota	*Larix*	*Sciadopitys*
Cedrus	*Libocedrus*	*Sequoia*
Cephalotaxus	*Picea*	*Taxodium*
Cryptomeria	*Pinus*	*Taxus*
Cunninghamia	*Podocarpus*	*Thuya*
Cupressus	*Prumnopitys*	*Tsuga*
Fitzroya	*Pseudolarix*	*Wellingtonia*

TREMBLING TREES. *See* **Populus Tremula** and **P. tremuloides.**

TREVORIA (named in honour of Sir Trevor Lawrence). ORD. *Orchideæ*. A monotypic genus discovered by Mr. F. C. Lehmann, of Popayan, who described it in the columns of the "Gardeners' Chronicle." An illustration of it, made from the finder's drawing, also accompanied it. The species, Chloris, is named after the goddess of flowers, and in the original description the reason for the generic and specific names is explained by Mr. Lehmann thus: "I have named this genus of *Orchidaceæ* in honour and commemoration of Sir Trevor Lawrence, Bart., President of the R.H.S., one of the most enthusiastic orchidists that ever lived. *Trevoria* has to answer our purpose; *Lawrencia* and *Lawrencella* being already in existence in *Compositæ* and *Malvaceæ* respectively. May Sir Trevor's love of Orchids endure sempervirent, as Chloris, the Goddess of Flowers." The flowers, which are in drooping racemes, and yellowish or greenish-yellow in colour, have been produced under cultivation in Sir Trevor Lawrence's collection.

TRIANEA BOGOTENSIS. The correct name of this is now *Limnobium bogotense.*

TRIAS. To the species described on p. 77, Vol. IV., the following should be added:

T. picta (painted). *fl.* honey-coloured, densely spotted with reddish-purple, fleshy, ⅜in. across. *l.* 2in. to 2½in. long, narrow-obovate, acuminate, fleshy. Pseudo-bulbs four-angled, ¾in. thick. Birma, 1888.

T. vitrina (vitreous-green). *fl.* pale green, with a few spots of brown on the lip, solitary on short pedicels. *l.* solitary, 3in. long. Pseudo-bulbs ovoid. Rhizome creeping. Tenasserim, 1895.

TRIBE. A section of a natural order embracing one or more genera; sometimes called a Family.

TRICHILIA. *T. glabra* is the correct name of *T. havanensis.*

TRICHIOSOMA LUCORUM. *See* **Sawflies.**

TRICHOCENTRUM. To the species and varieties described on p. 79, Vol. IV., the following should be added:

T. alatum (winged). A species allied to *T. fuscum*, but bearing smaller flowers, which are white, having the base of the lip yellow with red veins. Colombia, 1898.

T. albiflorum (white-flowered). *fl.* white, with a tinge of purple at the base of the lip, about 1in. across; spur short, two-toothed; raceme 1in. long. *l.* ovate, about 1in. long. Mexico, 1893.

T. albo-purpureum striatum (striated). *fl.* having a large purple blotch on each side of the base of the lip, and the apical part striped purple.

T. Hartii (Hart's). *fl.* about 1in. across; sepals and petals light yellow; lip white and reddish-brown. *l.* fleshy, oblong, 2in. long. Venezuela, 1894. Allied to *T. fuscum.*

Trichocentrum *continued.*

T. triquetrum (triquetrous). *fl.*, sepals and petals pale straw-yellow, the lateral sepals prolonged behind and adnate to the spur of the lip; lip straw-yellow, irregularly variegated and almost suffused with orange; spur 1½in. long; ovary triquetrous; peduncles axillary, 1in. long. *l.* vertical, equitant, 6in. long, ¼in. broad, gradually tapering to the apex. Peru. (L. vii., t. 311.)

TRICHOCLADUS (from *thrix, trichos*, hair, and *kladon*, a branch; the plants are stellate-tomentose or villous). SYN. *Dahlia* (of Thunberg). ORD. *Hamamelidex*. A small genus (five species) of greenhouse, evergreen shrubs, all South African, and closely allied to the Witch Hazels (*Hamamelis*). Flowers usually white, monœcious or diœcious, densely clustered in small heads or racemes; calyx five-parted; petals five; stamens five. Leaves opposite and alternate, entire; stipules inconspicuous. Only one species calls for mention here. For culture, *see* **Gardenia.**

T. grandiflorus (large-flowered).* *fl.* 1½in. in diameter, crowded in short, axillary and terminal, sub-sessile racemes; petals white, pink at base, strap-shaped, undulated. July. *l.* 3in. to 4in. long, shortly petiolate, ovate to ovate-lanceolate, caudate-acuminate, dark green above, paler beneath. 1890. A handsome shrub or small tree. (B. M. 7418.)

TRICHODESMA. To the species described on p. 79, Vol. IV., the following should be added:

T. physaloides (Physalis-like). *fl.*, calyx purple, at length 1in. to 1½in. long; corolla pure white; pedicels at length 1in. to 2in. long. *l.* glaucous-green, sessile, half-amplexicaul. Stem erect, angled. Rootstock fleshy. *h.* 1ft. to 2ft. South Africa, 1892. Greenhouse perennial. (G. C. 1892, xi., p. 363, f. 51.)

TRICHOGLOTTIS. *T. Dawsoniana* is the correct name of *Cleisostoma Dawsoniana*. *T. fasciata* is now classed under *Stauropsis*.

TRICHOMANES. Bristle Ferns. With the exception of a few species which undoubtedly require more than greenhouse temperature, the *Trichomanes* may without danger be submitted to the treatment recommended for *Hymenophyllum*. When not otherwise stated, they may be considered as thriving under the cool treatment recommended for Filmy Ferns generally. We may add that, whereas we do not advocate for either Hymenophyllums or Todeas the use of stone, this material is essential to the well-being of certain *Trichomanes*.

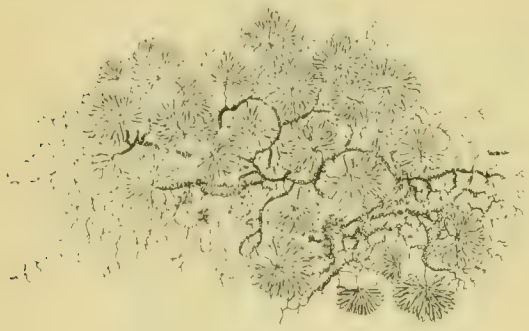


FIG. 727. TRICHOMANES PARVULUM.

As will be noticed in the descriptions of the species, many of the plants are provided with rhizomes, and these are in most instances of a very different nature from those of Hymenophyllums, as the greater part of them possess a very strongly-marked power of adhesion: it is for these species especially that the stone is necessary. While some of the kinds with slender, though equally hairy rhizomes, such as *T. humile*, *T. pyxidiferum*, *T. trichoideum*, and *T. venosum*, which in their natural habitats are usually found clothing Tree-fern stems, prefer rambling through decaying vegetable matter; others, also provided with very slender rhizomes, prefer sandstone, or stone of a very porous and soft nature—this is particularly the case with such species

Trichomanes—*continued.*

as *T. Colensoi*, *T. exsectum*, *T. parvulum* (Fig. 727), *T. tenerum*, &c. It has been noticed, however, that species provided with stout, hairy, creeping rhizomes, such

FIG. 728. TRICHOMANES JAVANICUM.

as *T. javanicum* (Fig. 728) and *T. radicans*, thrive best when in close proximity to stone of a harder nature, to which they will cling with great tenacity. It may be well to note here that whenever stone is used it is necessary that a little peat of a sandy-fibrous nature should be placed at its base to establish the plant.

The propagation of *Trichomanes* is usually effected by division of the rhizomes, although it also sometimes takes place by means of proliferous buds. For instance, *T. pinnatum* is conspicuously proliferous at the extremity of its fronds, where, when touching the ground, they frequently root of their own accord. In the same way a form of *T. radicans*, named *proliferum*, found in Ireland, may be increased by the rooting of the bulbils produced on the upper surface of its fronds. *Trichomanes* may also be propagated by means of spores, but this is a somewhat tedious process; in 1886 a batch of several hundred young *T. radicans* were raised in that way in Messrs. J. Veitch and Sons' nursery at Chelsea, and, strange as it may appear, the species reproduced itself without any noticeable deviation whatever from the normal form. The young plants thus produced had a much handsomer appearance than those resulting from the division of the rhizomes, as they grew more

Trichomanes—*continued.*

symmetrically and also more vigorously, but this hardly compensated for the length of time which seedlings take to develop, for the plants which in 1886 were only in 2¾in. pans were produced from spores sown on turfy peat in 1882. The experiment, however, was interesting from the fact that the young subjects thus obtained under artificial conditions were the first of which there is any record, and they conclusively proved that, with a certain amount of patience, *Trichomanes* may, like most other Ferns, be propagated from spores, especially when these can be gathered and sown immediately.

To the species and varieties described on pp. 79-82, Vol. IV., the following should be added:

T. alabamense (Alabama). A variety of *T. radicans.*

T. anceps (two-edged). A garden synonym of *T. Prieurii.*

T. Colensoi (Rev. W. Colenso's).* *rhiz.* wide-creeping, naked. *sti.* naked, 1in. long. *fronds* oblong-lanceolate, 2in. to 4in. long, pinnate; pinnæ distant, stalked, cut down quite to the stalks into very narrow segments. New Zealand. An elegant and delicate-looking, rare species.

T. elegans (elegant).* *rhiz.* tufted. *sti.* 2in. to 3in. long. *fronds* dimorphous; barren ones drooping, pinnatifid, 6in. to 8in. long, 2in. broad, broadly lanceolate, with nearly horizontal, crowded, toothed pinnæ and often caudate at apex; fertile ones 6in. to 12in. long, seldom ½in. broad, erect, undivided, fringed on each side with coarse, hair-like, slender spore-receptacles. Tropical America. A distinct species. SYN. *Feera elegans.*

T. fœniculaceum (Fennel-like). *sti.* erect, wiry, 2in. to 4in. long. *fronds* 4in. to 8in. long, 2in. to 3in. broad, erect, rigid, broadly ovate; lower pinnæ 1½in. long, cut nearly or quite to the stalk; pinnules deeply cleft into thread-like segments. Mauritius, &c. SYN. *T. parvifolium.*

T. Fraseri (Fraser's). *rhiz.* creeping. *fronds* small, erect, pale green, naked, somewhat flabellate, lobed. *sori* confined to the top lobes. West Indies, 1890.

T. fruticulosum (somewhat shrubby). This is described as "a stiff, wiry plant, with deep green fronds." Habitat not recorded, 1894.

T. Leprieurii (Le Prieur's). A synonym of *T. Prieurii.*

FIG. 729. PORTION OF FROND OF TRICHOMANES RADICANS ANDREWSII.

T. Lyallii (Lyall's). *sti.* 1in. to 2in. long, slender, filiform. *fronds* ¾in. to 2in. each way, sub-orbicular in general outline, flabellately divided nearly to the base into dichotomously-branched, narrow-linear, ciliated, minutely-denticulate segments. *sori* three or four, terminal on the segments; involucre obconical, quite sunk in the tube. New Zealand.

T. meifolium (Spignel-leaved).* *fronds* tufted, 2ft. high, lanceolate, very finely divided into linear segments, some of which, standing forward as in *Todea superba*, give the whole plant a delightful softness and richness. Java (at 4000ft. to 7000ft.), 1871. One of the most beautiful of all Filmy Ferns.

T. parvifolium (small-leaved). A synonym of *T. fœniculaceum.*

T. Prieurii (Le Prieur's).* *rhiz.* erect. *sti.* strong, tufted, 4in. to 8in. long. *fronds* slightly hairy above, 1ft. to 1½ft. long, 6in. to 12in. broad, broadly ovate, tri- or quadripinnatifid;

Trichomanes—*continued.*

main rachis narrowly winged above or throughout; lower pinnæ 4in. to 6in. long, their pinnules deeply cleft into rather distant, long, narrow, sharply-toothed segments. West Indies, &c. A magnificent species. (H. G. F., t. 11; H. S. F. i., p. 135, t. 40G.) SYNS. *T. anceps* (of gardens), *T. Leprieurii.*

T. radicans alabamense (Alabama). *rhiz.* thin, creeping, 1ft. long. *sti.* winged to the tip of the fronds. *fronds* 3in. to 7in. long, 2in. or less in breadth. *sori* clustered in a cup around a fine hair, or bristle, at the tips of the veins. North America.

T. r. Andrewsii.* This beautiful variety mainly differs from the type in having narrower fronds, with more distant and distinct leaflets. See Fig. 729.

T. r. proliferum (proliferous). *fronds,* when fully developed, dotted over with small bulbils, from which young plants are easily raised.

There are several other varieties of *T. radicans,* including *americanum, cambucum, crispum, dissectum,* and *d. cuneatum.*

T. roraimense (Roraima). A new species having fronds 5in. to 6in. long. Guiana, 1896.

T. strictum (erect). *fronds* lanceolate, very pale green, 4in. to 6in. long, three or four times divided nearly to the narrowly-winged stalk; pinnæ crowded, lanceolate; lower pinnules deeply cleft into ligulate lobes. New Zealand.

TRICHOPILIA. To the species described on pp. 83-4, Vol. IV., the following should be added:

T. brevis (short).* *fl.* two or three to a scape; sepals and petals greenish-yellow, blotched with chocolate, linear-lanceolate, acute; lip white, slightly flushed and veined with yellow on the front lobe and disk. *l.* solitary, elliptic-lanceolate, 6in. long. Pseudo-bulbs conico-cylindrical, 3in. to 5in. long. Peru, about 1891. (G. C. 1895, xviii., p. 641; I. vii., t. 332.)

T. coccinea marginata (scarlet, margined). The correct name of *T. marginata, T. coccinea* (B. M. 4857) being now regarded as a species. Other forms are *crispa* and *lepida* (both described as species in Vol. IV.), and *olivacea* (sepals and petals olivaceous).

T. crispa is a form of *T. coccinea.*

T. laxa (loose). *fl.* in loose, erect racemes, produced out of broad, obtuse, short, membranous, spotted bracts; sepals and petals pale watery green, faintly tinged with purple, erect, linear-lanceolate, equal; lip cream-colour. *l.* linear-oblong. Southern Colombia. SYN. *Pilumna laxa* (B. R. 1846, t. 57).

T. l. flaveola (yellowish). *fl.* having yellowish-white sepals and petals. 1884.

T. Lehmanni (Lehmann's). *fl.* white, with a yellow spot in the throat of the lip; sepals and petals linear-lanceolate, 1½in. long; lip with a large, oblong front lobe; scape 2in. to 3in. long, bracteate. *l.* solitary, oblong-lanceolate, obtuse. Pseudo-bulbs ovate-compressed. Colombia, 1888. Something in the way of *T. fragrans,* but with a one-flowered peduncle. (R. G. 1888, t. 1276, f. 2.)

T. lepida is a form of *T. coccinea.*

T. punctata (dotted).* This is allied to *T. laxa,* but differs from that and all other species in having the sepals and petals covered with numerous reddish-purple spots on a light green ground; lip greenish-white. Costa Rica, 1890.

T. Wageneri and *T. Warscewiczii* are grown in botanical collections.

TRICHOPODIUM. A synonym of **Trichopus** (which *see*).

TRICHOPUS (from *thrix, trichos,* hair, and *pous,* a foot or stalk; in allusion to the filiform pedicels). SYNS. *Podianthus, Trichopodium.* ORD. *Dioscoreaceæ.* A monotypic genus. The species, *T. zeylanicus,* is a curious, dwarf, stove plant, with a woody rootstock, from which spring numerous short, wiry, trigonal stems, each bearing a cordate-lanceolate leaf 2½in. long and several purple, star-shaped flowers on slender stalks (B. M. 7350). It is not of much horticultural value.

TRICHOSANTHES. *Ceratosanthes tuberosa* is the correct name of *T. tuberosa.*

TRICHOSMA. To the species described on p. 86, Vol. IV., the following variety should be added:

T. suavis Meulenaereana (Meulenaer's). This differs from the type in the lip lacking the large yellow blotch and in being strongly lined with violet-purple instead of reddish-brown. Sikkim, 1894.

TRICHOSTEMA. To the information given on p. 86, Vol. IV., the following should be added. For culture, *see* **Salvia.**

Trichostema—*continued.*

T. lanatum (woolly). *fl.* bluish-purple, with very long, projecting stamens, disposed in long, virgate, interrupted spikes; inflorescence wholly clothed with purple, woolly hairs (which become short in the variety *denudatum*). *l.* entire, linear Stems simple. *h.* 1½ft. South California. An interesting, half-hardy sub-shrub. SYN. *T. Parishii.*

T. Parishii (Parish's). A synonym of *T. lanatum.*

TRICHOTOSIA. Included under **Eria** (which *see*).

TRICUSPIDARIA. *T. dependens* (B. M. 7160) is the correct name of *T. hexapetala.*

TRICYRTIS. Of *T. hirta* there is a form *nigra*, which is more attractive and earlier-flowering than the type.

TRIDAX. Including *Sogalgina.* To the species described on p. 87, Vol. IV., the following variety should be added:

T. bicolor rosea (two-coloured, pink).* *fl.-heads* 1½in. to nearly 2in. across; ray florets rose-coloured, fifteen to eighteen, rather broad, three-toothed; disk yellow. Summer. *l.*, basal ones somewhat triangular, 2in. long, 1in. broad, strongly nerved, the margin widely toothed; upper ones becoming gradually narrower and smaller, most of them quite entire. *h.* 1ft. to 1½ft. North Mexico, 1887. A pretty, hardy annual, but it should not be sown too early. (G. C. 1887, ii., p. 553.)

TRIFOLIATE. Three-leaved. Often incorrectly used for **Trifoliolate** (which *see*).

TRIFOLIUM. To the species described on pp. 88-9, Vol. IV., the following should be added:

T. alpinum (alpine).* *fl.* purple; upper petal pink, streaked with purple; head umbellate, long-pedunculate. July. *l.*, leaflets ternate, lanceolate-linear; petioles long; stipules very long and narrow. Stem very short and thick, underground. *h.* 3in. to 6in. European mountains, 1775. Rockery.

T. armenium (Armenian). The correct name of *T olympicum.*

T. aurantiacum (orange). *fl.* orange, in an ovate head; standard obovate-oblong. May and June; peduncle very much longer than the leaves. *l.*, leaflets oblong and oblong-linear, often retuse, the terminal one stalked. Greece. An erect or decumbent annual.

T. involucratum (involucred). The correct name of *T. imbricatum.*

T. pannonicum (Pannonia).* *fl.* creamy-white (yellow when dry); head terminal, pedunculate, ovate-oblong, thick. June. *l.*, leaflets lanceolate-oblong, obtuse, acute, or retuse. Stems simple, thick. *h.* 1ft. Piedmont Alps, 1752. Plant very pilose.

T. polyphyllum (many-leaved). *fl.* purple, at length deflexed; peduncle longer than the leaves, umbellately three- to eight-flowered. Summer. *l.* radical, rather long-petiolate; leaflets seven to nine, oblong-linear or linear, remotely serrated. Rhizome very hard. Caucasus. Plant highly glabrous, tufted, stemless.

T. repens pentaphyllum (five-leaved). A pretty little rock plant with bronzy foliage.

TRIFURCIA is synonymous with **Herbertia** (which *see*).

TRIGONELLA. *Medicago ruthenica* is the correct name of *T. ruthenica.*

TRIGONIDIUM. To the species described on p. 89, Vol. IV., the following should be added:

T. latifolium (broad-leaved). *fl.*, sepals and petals yellow and purple; lip with a fleshy yellow front lobe and narrow purplish side ones. *l.* obovate-oblong, 6in. long, 2in. broad. Brazil, about 1894 (first described in 1837). (B. R., t. 1923.)

TRILLIUM. To the species described on p. 90, Vol. IV., the following should be added:

T. discolor atratum (dark).* *fl.* maroon, medium-sized. *l.* distinctly marked. 1888.

T. recurvatum (recurved). *fl.* sessile; inner perianth segments brownish-purple, ¾in. to 1½in. long, oblong-lanceolate, narrowed to a claw at base; outer ones reflexed. Spring. *l.* petiolate, ovate to ovate-oblong, usually acute at both ends, marbled.

T. sessile californicum (Californian).* *fl.*, inner perianth segments purple, pink, or white, 1in. to 4in. long, oblanceolate to rhombic-obovate. *l.* broadly rhombic-ovate, 3in. to 6in. long, spotted. Stouter than the type. (G. & F. 1890, p. 321, f. 44.)

TRINACTE. A synonym of **Jungia** (which *see*).

TRIOPTERIS [the correct spelling]. According to the "Index Kewensis," *T. jamaicensis* and *T. lucida* are distinct species, and not forms of *T. rigida.*

TRIPHASIA. *T. Aurantiola* is the correct name of *T. trifoliata.*

TRIPHYSARIA. *See* **Orthocarpus.**

TRIPINNATIFID. Thrice-cleft nearly to the base or midrib.

TRIPINNATISECT. Thrice-cleft to the base or midrib.

TRISIOLA. A synonym of **Uniola** (which *see*).

TRISTANIA. To the species described on p. 93, Vol. IV., the following should be added:

T. densiflora (dense-flowered). *fl.* crimson; cymes numerous, three-flowered. *l.* opposite, entire, ovate, coriaceous. Australia, 1881. Shrub.

T. laurina (Laurel-like). *fl.* yellow, very small, in short, axillary cymes. *l.* alternate, lanceolate, elliptic, or obovate-lanceolate, acuminate, penniveined, 2in. to 4in. long, narrowed to the petioles; under-side of the younger ones glaucous or silky-pubescent. Australia. Shrub or tree. (B. M. 7529.)

TRITELEIA. Star Flower. To the species described on pp. 93-4, Vol. IV., the following should be added. *See also* **Brodiæa.**

T. Bridgesii (Bridges'). This is very near *T. laxa*, but the perianth tube is lengthened into a sub-cylindrical base and the filaments are as long as the linear anthers. 1888. (G. & F. 1888, p. 226.)

T. Hendersoni (Henderson's). This is allied to *T. Bridgesii*, but the segments of the salmon-coloured perianth (which is ¾in. to 1in. long) are ribbed with brownish-purple and the pedicels are not above 1in. long. Oregon, 1890.

T. peduncularis (peduncled). *fl.* rose-purple, small, ¾in. to 1in. long; pedicels sometimes 6in. to 10in. long. Otherwise like *T. laxa.* California. (G. C. 1896, xx., p. 243, f. 47, under its correct name *Brodiæa peduncularis.*)

T. uniflora cærulea (blue).* *fl.* of a beautiful porcelain-blue. STELLA is another garden form.

TRITHRINAX. To the species described on p. 94, Vol. IV., the following should be added:

T. campestris (field-loving).* A Palm of majestic appearance, allied to *T. brasiliensis*, but differing in having the leaflets shortly bifid, white-tomentose above, glabrescent beneath; the branches of the spadix are also stouter. South Argentina, 1889.

TRITONIA. According to J. G. Baker, this genus now embraces upwards of thirty species.

The *Montbretia* section is the most popular with gardeners, on account of the very gracefully disposed flowers and elegant foliage. The colour-range is not a large one—usually some shade of orange or yellow—and they are most useful for furnishing cut-flower material. The older but still beautiful *M. Pottsii*, and one or two others once favoured, have been to a certain extent superseded by the garden varieties (Fig. 730), a list of which will be found below. The bulbs of this section are best planted in autumn, lifted annually on heavy soils, and replanted in fresh quarters; but upon light ones they need not be disturbed oftener than every two or three years.

To the species described on pp. 94-5, Vol. IV., the following should be added. Some of the plants formerly known as Tritonias are now classed under **Acidanthera, Antholyza, Crocosmia, Freesia, Gladiolus,** and **Ixia.**

T. capensis. The correct name is *Acidanthera capensis.*

T. miniata is a variety of *T. crocata.*

T. rosea (rosy). *fl.* four to twelve in a loose spike; perianth bright red, 1in. long, the tube broadly funnel-shaped, the segments oblong; spathe valves ¼in. to ½in. long. June. *l.* linear, firm, 1ft. long. Stems branched, 1½ft. to 2ft. long. Corm globose, 1in. in diameter. (B. M. 7280.)

Varieties. Some of the best of the popular *Montbretia* section of this genus are:

AURORE, BOUQUET PARFAIT, ELDORADO, ELEGANS, ETOILE DE FEU, FANTAISIE, GERBE D'OR, GOLDEN SHEAF, SOLFATERRE, SULPHUREA, TALISMAN, and TRANSCENDANT.

TROCHETIA. To the species described on p. 96, Vol. IV., the following should be added:

T. Blackburniana (Blackburn's). *fl.* ample, campanulate; petals white, edged, veined, and blotched with blood-red; peduncles one-flowered. May. *l.* long-petiolate, elliptic- or obovate-oblong, acute, entire or crenate-serrated. Mauritius. A Hibiscus-like, stove shrub or small tree. (B. M. 7209.)

T. erythroxylon. The correct name is *Melhania erythroxylon.*

TROCHODENDRON (from *trochos*, a wheel, and *dendron*, a tree; in allusion to the wheel-like flowers). ORD. *Magnoliaceæ*. A monotypic genus. The species is a very singular, hardy, evergreen shrub or small tree, with the habit of a *Heptapleurum*, and requiring similar culture to **Magnolia.**

T. aralioides (Aralia-like). *fl.* green, star-like, nearly or quite 1in. across, in erect, terminal, sessile racemes; petals wanting; stamens many, radiating. Spring. *l.* 3in. to 4in. long, long-petiolate, ovate or oblong-ovate, obtusely acuminate, crenate-serrated. Bark aromatic. *h.* 12ft. to 16ft. Japan, before 1894. (B. M. 7345; G. C. 1894, xv., p. 16, f. 91.)

FIG. 730. TRITONIA (MONTBRETIA) GARDEN VARIETIES.

TROCHOSTIGMA. A synonym of **Actinidia** (which *see*).

TROLLIUS. To the species described on pp. 96-7, Vol. IV., the following should be added:

T. americanus is the correct name of *T. laxus.*

T. asiaticus. *fl.* bright orange, large, with a semi-double appearance, having eleven to fifteen orange sepals, and linear petals. There are other varieties in gardens, including *aurantiacus.*

Trollius—*continued.*

T. dshungaricus. *fl.*, sepals fifteen, golden within, reddish outside, spreading, rounded at apex, mucronate-denticulate; style straight, subulate. Otherwise resembling *T. europæus.* Turkestan.

FIG. 731. TROLLIUS ORANGE GLOBE.

T. europæus (Boits) exhibits much variation, different forms being known in gardens as *albidus, dauricus, giganteus, napellifolius* (the last being very showy), and ORANGE GLOBE (see Fig. 731).

T. japonicus (Japanese). *fl.* yellow, veined; sepals 1in. or less in length, ten or more; peduncle 7in. long, leafy-bracted to the middle. *l.*, radical ones rounded-cordate, five-parted to the base. Japan. Allied to *T. asiaticus.* The variety *flore-pleno* has double flowers.

T. Ledebourii (Ledebour's). *fl.* yellowish; sepals five, spreading, veined, ovate; petals ten to twelve, narrow-linear, exceeding the stamens but inconspicuous. May. *l.* cleft to the base; segments lobed and toothed. *h.* 2ft. Siberia, 1827.

TROMSDORFFIA (of Blume). Included under **Chirita** (which *see*), the correct name of *T. speciosa* being *C. Horsfieldii.*

TROMSDORFFIA (of R. Brown). A synonym of **Dichrotrichium** (which *see*).

TROPÆOLUM. To the species described on pp. 97-9, Vol. IV., the following should be added:

T. aduncum. According to the Kew Hand-list this is the correct name of *T. peregrinum.* SYN. *T. canariense.*

T. canariense (Canary Islands). A synonym of *T. aduncum.*

T. Leichtlini (Leichtlin's).* *fl.* bright orange-yellow, with red spots, in a long, leafy raceme. May and June. 1895. A garden hybrid between *T. polyphyllum* and *T. edule.*

T. Lindeni (Linden's). *fl.* small, with a large, conical spur 1½in. long; peduncle filiform. September. *l.* peltate, obcordate, 3½in. to 5in. long, rosy-tinted. Colombia, 1894. Greenhouse.

T. Smithii is a form of *T. aduncum.*

T. violæflorum (Viola-flowered). The correct name *T. violæfolium.*

Dwarf Varieties. These are amongst the most useful of annuals, as they succeed best in the driest and poorest of soils, and are excellent bedding and border subjects. In addition to the varieties given in Vol. IV., p. 98, the following should be added:

AURORA, rosy-fawn, suffused orange-red; CÆRULEUM ROSEUM, rose, tinged with blue; CHAMELEON, cream to primrose, with rose or crimson markings; CLOTH OF GOLD, golden foliaged; CRYSTAL PALACE GEM, sulphur, spotted maroon; H. M. STANLEY, copper; LADYBIRD, rich yellow, with crimson veining; LILIPUT, variable as to colour, good for borders; SCARLET KING, brilliant scarlet, an effective bedder; and TERRA COTTA, coppery-buff.

Tropæolum—*continued.*

Tall Varieties. These are usually grown as half-hardy annuals; but they may be sown in the open border as soon as danger from frost is past. They are equally effective either indoors or outside, and are most useful for covering trellis work, arbours, &c. The following are good kinds, and, like the dwarfs, do best in poor soils.

ASA GRAY, varying from cream to yellow; BRILLIANT, bright scarlet, with crimson throat; CARDINALE, small, scarlet, of close habit; CRYSTAL PALACE SCARLET, orange-scarlet, very showy; FIREFLY, deep orange, suffused blood-red; GOLDEN QUEEN, deep yellow; LUCIFER, bright scarlet, with rich, dark foliage; PRIMROSE; SPITFIRE, brilliant scarlet.

TRUMPET GALL. *See* **Vine Galls.**

TRUMPET WEED. *See* **Eupatorium purpureum.**

TRUNK. The stem of a tree.

TRUSS. A popular name for a compact, moderate-sized cluster of flowers. An umbel of flowers produced from one centre and growing on one stem, as in the Pelargonium, Verbena, Auricula, &c.

TRYPETA POMONELLA. *See* **Apple Maggot.**

TSUGA. To the species described on pp. 101-2, Vol. IV., the following should be added:

T. diversifolia (variable-leaved). *l.* somewhat distichous, flat, entire, linear, very shortly petiolate. *cones* sub-sessile, reflexed or nodding, narrow-elliptic, acute; scales orbicular or rounded-ovate. Trunk tall, with a narrow, conical head; branches and branchlets twiggy. Japan, 1878. SYN. *Abies diversifolia.*

T. Douglasii (Douglas's). A synonym of *Pseudotsuga Douglasii.*

T. Lindleyana (Lindley's). A synonym of *Pseudotsuga Douglasii.*

T. Pattoniana glauca (glaucous).* *l.* of a lovely glaucous hue. Branches more drooping than in the type.

T. Williamsonii (Williamson's). A synonym of *T. Pattoniana.*

TUBERCINIA SCABIES. *See* **Scab.**

TUBERIFEROUS. Bearing tubers.

TUBULAR FLORET. A disk-flower in *Compositæ.*

TULBAGHIA. To the species described on p. 102, Vol. IV., the following should be added:

T. natalensis (Natal). *fl.* fragrant; perianth white, ¼in. long; corona greenish-white; umbels six- to ten-flowered; scape over 1ft. long. May. *l.* six to eight, linear, bright green, 6in. to 12in. long. South Africa, 1891.

TULIPA. To the species and varieties described on pp. 104-8, Vol. IV., the following should be added:

T. Batalini (Prof. Batalin's). *fl.*, perianth pale lemon-yellow, the segments longish-oval, blunt, turning outwards at tip, sometimes irregularly notched. *l.* five, green, smooth, linear-lanceolate, trailing on the ground. Bulb-scales brown, woolly on the inner surface. Bokhara, 1889. (G. C. 1896, xix., p. 759, f. 131; R. G., t. 1307, f. 2.)

T. Billietiana (Cardinal Billiet's).* *fl.*, perianth wholly yellow, the outer segments acute, the inner ones rounded at apex. Switzerland, 1888. A showy Tulip, allied to *T. Didieri.* (B M. 7253.

T. bœotica (Bœotian).* *fl.*, perianth saturated with red, 1½in. to 2in. long; segments oblong, acute or acuminate, six to eight lines broad, having a narrow-elongated, black, yellow-girdled spot at base; peduncle 2in. to 3in. long. *l.* three or four, below the middle of the stem, undulate-margined, lorate-lanceolate, 5in. to 6in. long; upper ones lanceolate. *h.* 1ft. Bœotia, &c.

T. chrysantha (yellow-flowered). *fl.*, perianth yellow, or orange, or reddish-tinged outside, unspotted, scented, 1in. to 1½in. long; segments oblong. *l.* three or four, glabrous, glaucous, much undulated, recurved or ascending, lanceolate, 4in. to 6in. long. Floriferous stem glabrous, 3in. to 4in. long. Persia, &c., 1894.

T. ciliatula (slightly ciliated). *fl.*, perianth bright crimson. This is closely related to *T. undulatifolia*, but differs from that species in the shorter, obtuse perianth segments, and from *T. præcox* by its sub-glaucous bulb-scales. Asia Minor, 1890.

T. Clusiana alba (white).* *fl.*, perianth white; segments having a pale purple spot at the base inside, and purple outside; anthers purplish. Chitral, 1897. (G. C. 1897, xxi., p. 73, f. 20.)

Tulipa—*continued.*

T. concinna (neat).* *fl.*, perianth crimson, campanulate, 1½in. long, the minutely-mucronate segments having an obscure blackish-purple blotch at the base; peduncle 2in. to 3in. long. April. *l.* four, glaucous, obscurely ciliated, undulated, the lowest 5in. to 6in. long. Stem 9in. long. Bulb small. Taurus, 1893.

T. cuspidata (cusp-pointed). The correct name of *T. Elwesii.*

T. Dammanniana (Dammann's). *fl.*, perianth purple, marked with a black blotch at the base of the segments; filaments glabrous. *l.* linear-lanceolate, slightly ciliated on the margins. Bulb-scales villous inside. Mount Lebanon, 1889. Allied to *T. linifolia*, but less hardy. (R. G. 1889, t. 1300, f. 2.)

T. Didieri alba (white). A pretty cream-white, fragrant variety.

T. D. lutescens (yellowish). A variety with pale yellowish flowers with greenish centres.

T. Dracontia. *See* **T. Gesneriana.**

T. elegans alba (white).* A variety with reflexed petals, white, edged with carmine.

T. Elwesii. The correct name is *T cuspidata.*

T. flava (yellow). *fl.* continuing after most of the species have finished blossoming; perianth bright yellow; segments marked down the centre with a distinct green band. Of garden origin.

T. fragrans (scented). *fl.*, perianth yellow, infundibular-campanulate, 1in. to 1½in. long; segments acute, ½in. to ¾in. broad. *l.* three, 6in. to 8in. long, ascending, glaucescent, linear-lorate, acute. Stem 6in. to 12in. high, one-headed. Bulb ovoid, ½in. to ¾in. thick. Algiers. This is now regarded as specifically distinct from *T. sylvestris.*

T. Greigi. The following forms are described in Continental periodicals: *æstuans* (flowers reddish, large), *aurea* (yellow, red outside, large), *carminea* (carmine-scarlet, black-spotted), *compta* (intense red, yellow at base), *imperialis* (segments eight, red, black at base), *parviflora* (scarlet, black-spotted, yellow-edged, small), *picta* (yellow, large, a black-bordered red spot in centre of each segment, outer segments tipped red), *pulchella* (supposed hybrid between *T. Greigi* and *T. Kaufmanniana*), and *Victoriæ* (red, yellow-streaked, large).

T. Grisebachiana is now regarded as a form of *T. Orphanidea.*

T. lanata (woolly). *fl.*, perianth purple, campanulate, with a large, yellow-bordered, black spot at the base of the segments, which are woolly-tipped; peduncle one-flowered. *l.* three or four, usually falcate, broadly clasping, the margins minutely ciliolate. Stem flexuous, 10in. to 14in. high. Eastern Bokhara. Allied to *T. Greigi.*

T. Leichtlini (Leichtlin's). *fl.* always erect; perianth large; outer segments of a rich purplish-red or coral-pink, broadly margined with white, shorter than the inner ones, which are yellowish-white and oblanceolate; scape 1ft. high. *l.* erect or recurved, linear-lanceolate, acuminate. Kashmir, 1889. Allied to *T. stellata.* (Gn. 1891, 819.)

T. Levieri (Levier's). *fl.*, perianth scarlet, large; segments having a basal black blotch margined with golden-yellow Persia, 1894. This is probably a form of *T. montana.*

T. libanotica (Lebanon). *fl.*, perianth purple, with an elongated, blackish spot at the base of the oblanceolate segments; anthers shorter than the filaments; scape glabrous. *l.* flaccid, linear, wavy and ciliated on the margins. Mount Lebanon, 1888. Allied to *T. linifolia.*

T. linifolia (Flax-leaved). *fl.*, perianth of a brilliant vermilion-scarlet, nearly 2½in. in diameter, with small black blotches in the centre; segments spreading, alternately obcordate and cuneate; anthers yellow; scape 6in. high. *l.* about three, glaucous, lanceolate, gradually tapering, boat-shaped, the margins crenate, revolute. 1886. (R. G. 1235, d-f.)

T. Lownei (Lowne's). *fl.*, perianth bright lilac, nine to fourteen lines long, infundibular-campanulate, the segments marked at base with a broad, bright yellow stain; pedicels 1½in. to 2in. long. *l.* two, yellowish-green, spreading, falcate, glabrous, channelled, lanceolate, 3in. to 4in. long. Stem one- or two-headed, deeply forked. Syria, 1899.

T. Maximowiczii (Maximowicz's). *fl.*, perianth scarlet-purple, the outer segments marked at their base with a white-bordered, bluish-black spot. *l.* alternate, distant, linear, with red, minutely ciliolate margins. Stem leafy. Bokhara, 1889. Allied to *T. linifolia*, but having the bulb-scales hairy within at apex. (G. C. 1896, xix., p. 757; R. G. 1889, t. 1307, f. 1.)

T. platystigma (having a broad stigma). *fl.* violet-scented; perianth rosy-lilac, 2in. to 2½in. long, campanulate, the segments having a small blue and yellow spot at base. *l.* three or four, glaucescent, ciliolate, much undulated; lower ones lanceolate, 6in. to 8in. long. Stem flexuous, 1ft. to 1½ft. high. Bulb ovoid, 1in. thick. French Alps. From this species the Parrot Tulips have been evolved.

Tulipa—*continued.*

T. polychroma (many-coloured). This is described as "a dwarf species, nearly allied to *T. Celsiana* and *T. stellata*." Persia, 1894.

T. scabriscapa (rough-scaped). *fl.*, perianth variable in colour, elegantly cup-shaped, with slightly-pointed segments having two strong furrows down the middle; stigma overhanging, not so large as in *T. Gesneriana*. April and May. *l.*, lower ones oblong-lanceolate; upper ones narrower. Italy, 1837. (B. R. 1890.)

T. Schrenki (Schrenk's). *fl.* erect; perianth purplish or yellowish, spreading-campanulate, the segments elliptic or elliptic-lanceolate. *l.* three or four, undulated, erecto-patent or spreading-recurved, the lower ones elliptic-lanceolate or lanceolate, the upper ones narrow. Turkestan. This is now regarded as distinct from *T. Gesneriana*.

T. Sintenisii (Sintenis'). *fl.*, perianth pale glaucous-red and scarlet, with a black blotch on the claw; segments blunter than in *T. undulatifolia* (to which this curious dwarf species is nearly allied). *l.* flat. Turkish Armenia, 1891. (B. M. 7193.)

T. spathulata is now regarded as a distinct species, and not as a form of *T. Gesneriana*.

T. Sprengeri (Sprenger's). This species closely resembles *T. Hageri*, but lacks the black blotch on the inside of the claw; the filaments also are hairless and narrowed at the base. Armenia, 1894. (R. G., t. 1411.)

T. stenopetala (narrow-petaled). A synonym of *T. acuminata*.

T. sultanabadensis (Sultanabad).* *fl.*, perianth of a brilliant scarlet, large, with a black, unbordered blotch on the inner side of the base of the segments. Sultanabad, Persia, 1894. This species is nearly allied to *T. undulatifolia*.

T. Thirkeana (Thirke's). A species very closely allied to *T. Biebersteiniana* (with which, in fact, it was formerly considered synonymous). Orient.

T. violacea (violet). *fl.* erect, mediocre; perianth of a bright mauve-red, with a white-bordered, black blotch at the base inside, 1¼in. long, the segments acute; anthers violet. *l.* approximate, linear, 4in. to 5in. long, channelled, acute. Stem dwarf, three-leaved towards the middle. North Persia, 1894. (B. M. 7440.)

T. viridiflora (green-flowered). *fl.* pale yellow and green. An interesting plant, the origin of which is unknown—doubtless derived from *T. Gesneriana*, and flowering rather later than the type of that species. (Gn. xxxii. 514.)

T. vitellina (egg-yolk-coloured).* *fl.*, perianth of a delicate yellow, large, the segments ovate, obtuse. *l.* ovate-lanceolate, acute, glabrous. *h.* 1ft. to 2ft. 1889. A sturdy garden hybrid, probably between forms of *T. suaveolens* and *T. Gesneriana*.

Florists' Tulips. These choice old garden flowers are now being inquired after by amateurs. Many persons in the South of England seem desirous of emulating those amateurs near Manchester and in the Midland Counties who have continued to cultivate this historical flower through a period of comparative neglect. An old author says: "The Tulip asketh a rich soil and the careful hand of the gardener." This is well known to those who grow for exhibition purposes, and they are ever careful to trench the ground well, to manure it sufficiently, and, above all, to protect the delicate blossoms from beating rains. Canvas shading of some kind, fixed on a framework, the roof portion to move up and down on rollers, is usually adopted for this purpose.

Florists' Tulips are divided into three classes, viz.: Bizarres, Byblœmens, and Roses. These are again divided for garden and exhibition purposes into Feathered and Flamed Tulips. The ground-colour in the Bizarres is a clear yellow, and in the Byblœmens and Roses a pure white. The flame and feathering on the Bizarres is red, chestnut-red, or maroon; some have the markings so dark as to appear almost black, such as may be seen in Storer's William Lea, or Slater's Masterpiece. The red ground is prominent in Storer's Dr. Hardy, or Bowler's Everard; there is the chestnut feathering in Ashmole's Garibaldi. The Byblœmens have the colours of a deep rich purple or shades of purple, so dark in Jackson's David Jackson that the fanciers describe the feathering as black. Hepworth's Bessie is also a handsome variety, with beautiful purple-black feathering on a pure white ground. Other varieties are feathered and flamed with various shades of colour; in a few the purple almost verges into lilac.

The Roses, as they are termed, are also of many degrees of intensity, and very charming in the flamed and feathered state. As illustrations of the various shades of colour we have Industry (Lea), a bright carmine-scarlet feather on the purest of white grounds. Heroine

Tulipa—*continued.*

is a true Rose, generally finely-feathered on a very pure white. Nanny Gibson (Hepworth) has a brilliant scarlet feather on white, and is very lovely in this state. Another shade of colour (rosy-red on pure white ground, both flamed and feathered) is found in Charmer, Mabel, Mrs. Lomax, and Pretty Jane, raised by a florist named Martin. These are all one variety, and it may be well to point out how this happens. Nearly all seedling Tulips flower first in what florists term the "breeder" state, that is, as self-coloured; and for some years it will continue to flower as a Self, and it passes into the hands of various florists in this breeder state. But by-and-by the breeders will break into flamed or feathered flowers. Brown may have one, Jones another, and a third may

FIG. 732. COTTAGE GARDEN TULIPS.

be in the hands of Robinson. Each of these florists claims the right to name any variety that may break into the flamed or feathered condition in his hands; but they are all the same thing, varying slightly in the quality of the markings, and whoever happens to get the best break claims to have the finest strain. The same remarks apply to all the other classes. Again, a florist such as the Rev. F. D. Horner obtains all the best strains in existence in all the classes, and florists get to know of the superior quality of the Tulips grown by him, and they may obtain this strain, calling it "Horner's strain," probably because they know well that a fastidious florist will not grow a bad strain of any of his favourites.

The varieties are very numerous; in fact, there are many hundreds grown under different names in England and on the Continent. On the other hand, the number of really good flowers, correct in their markings, with stamens unstained, and pure in the base of the cup, scarcely exceeds six in each class. The following exhibition varieties are based on the enumeration of that famous cultivator, the late Mr. Samuel Barlow:

Feathered Bizarres. COMMANDER, DEMOSTHENES, DR. DALTON, GARIBALDI, GEORGE HAYWARD, JOHN RADCLIFFE, SIR JOSEPH PAXTON, SULPHUR, and TARGET.

Tulipa—*continued.*

Flamed Bizarres. AJAX, DR. DALTON (this and some others are found in both the Feathered and the Flamed state), DR. HARDY, EVERARD, EXCELSIOR, LORD DELAMERE, MASTERPIECE, ORION, POLYPHEMUS, SIR JOSEPH PAXTON, SULPHUR, SURPASS, WILLIAM LEA, and WILLIAM WILSON.

Tulipa—*continued.*

Byblœmens. ALICE GRAY, ASHMOLE'S 112, DAVID JACKSON, GLORY OF STAKEHILL, MARTIN'S 117, MISS HARDY, and TALISMAN.

Roses. ANNIE MCGREGOR, LADY GROSVENOR, LADY MAY, MABEL, MRS. BARLOW, and NANNY GIBSON.

FIG. 733. COTTAGE GARDEN TULIPS IN BED.

Feathered Byblœmens. ADONIS, ALICE GRAY, BESSIE, DAVID JACKSON, FRIAR TUCK, MRS. COOPER, NIMBUS, NULLI SECUNDUS, TALISMAN, and WILLIAM BENTLEY.

Flamed Byblœmens. ADONIS, ATTRACTION, BACCHUS, CARBUNCLE, DAVID JACKSON, DUCHESS OF SUTHERLAND, FRIAR TUCK, JOHN PEACOCK, and TALISMAN (this variety is best in the Flamed state).

FIG. 734. TULIPA KAUFMANNIANA.

Feathered Roses. ANNIE MCGREGOR, CHARMER, MABEL, MRS. LOMAX, and PRETTY JANE (these four are the same), HEROINE, INDUSTRY, LADY GROSVENOR, LADY WILTON, MADAME ST. ARNAUD, MODESTY, and NANNY GIBSON.

Flamed Roses. ADAIR, ANNIE MCGREGOR, LADY SEFTON, MRS. BARLOW, SARAH HEADLEY, and TRIOMPHE ROYAL.

Breeders' Bizarres. ARIOSTO, DR. HARDY, EXCELSIOR, HORATIO, ORION, and SIR J. PAXTON.

Cottage Garden Tulips are now very popular, and efforts have been made by bulb specialists and others to get into commerce many of the varieties found in old-fashioned gardens (Figs. 732 and 733). Then there are the species, &c., some of them quaint, like *T. acuminata*, or beautiful, like *T. Kaufmanniana* (Fig. 734), *T. Clusiana*, *T. Kolpakowskiana*, *T. Gesneriana spathulata*, *T. saxatilis*, *T. vitellina*, *T. macrospeila* (Fig. 735), and

FIG. 735. TULIPA MACROSPEILA.

Tulipa—*continued.*

many others. Old varieties like Tournesol (Fig. 736) and Pottebakker (Fig. 737) are also still much grown.

FIG. 736. TULIPA TOURNESOL.

Double Early-flowering and Bedding Tulips. AGNES, bright scarlet; ALBA MAXIMA, creamy-white, with yellow centre; BLANCHE ROSETTE, white, feathered rose; BRIDE OF LAMMERMOOR, white, flushed rose; COURONNE DE CERISE, ruby-crimson; EMPEROR WILLIAM, vermilion-scarlet, margined

FIG. 737. TULIPA POTTEBAKKER.

with yellow; HENRY WITTE, orange-scarlet, margined with golden-yellow; LEO XIII., brilliant scarlet, with yellow centre;

Tulipa—*continued.*

L'INNOCENCE, pure white; MINNIE HAWK, carmine-rose; OVERWINAAR, white, striped with violet; ROSEA PERFECTA, light rose, flushed with white; ROSE BLANCHE, pure white, very fine; THE MOOR, dark maroon; WILLIAM III., bright scarlet.

FIG. 738. TULIPA PICOTEE.

Single Early-flowering and Bedding Tulips. ALBERT CUYP, cherry-rose, flushed silvery-white; BOULE D'OR, soft yellow; BRIDE OF HAARLEM, crimson-scarlet, feathered white, handsome; BRUNEHILDE, white, flushed soft yellow; CERISE GRISELINE, purple-cerise, edged white, very fine; CHANTICLEER, scarlet, edged gold, showy; DUC DE MALAKOFF, deep scarlet,

FIG. 739. DARWIN TULIP THE SULTAN.

Tulipa—*continued.*

margined with gold; DUC VAN THOL COCHINEAL, rich vermilion; FABIOLA, rose-violet; FRANS HALS, pure white; KOH-I-NOOR, yellow, very handsome; LA BELLE ALLIANCE, crimson-scarlet; LAC DOREE, deep cherry, margined pure white; LA LAITIERE, pure white, flushed sky-blue; LA RIANTE, bright rose; LORD DERBY, pure white; MIRANDA, deep carmine-rose; OPHIR D'OR, deep yellow, very fine; POTTEBAKKER, scarlet; POTTEBAKKER, yellow; PRIMROSE QUEEN, primrose; PRINCE OF AUSTRIA, brick-red, shaded buff; PRINCESS IDA, white, shaded creamy-yellow; QUEEN OF THE NETHERLANDS, soft rose, flushed white; ROSAMUNDE, rose-pink, flushed white; SARAH BERNHARDT, deep rose, flaked white; VAN VONDEL, crimson-scarlet, flushed white; VILLAGE BEAUTY, salmon-rose, shaded white.

Late-flowering Single Tulips. ANNIE, deep yellow; BRIDESMAID, bright rose, suffused with white; BUENAVENTURA, scarlet, with gold flakings; CHAMELEON, pale plum, blotched maroon, and shaded yellow; DAINTY MAID, white, with rosy-lilac markings; FAERIE QUEEN, pinkish heliotrope, margined with yellow; FIREFLY, bright orange, with green and gold centre; GALA BEAUTY, blotched vermilion and deep yellow; GOLDEN BEAUTY, deep yellow, very fine; GOLDEN CROWN, yellow, edged with crimson, and with black anthers; LA PANACHEE, flaked white and cherry-crimson, handsome; PICOTEE (Fig. 738) white, margined rose, very beautiful; ROYAL WHITE, creamy-white, with yellow centre; STRIPED BEAUTY, rose, flaked deep crimson and white; YORK AND LANCASTER, white and pink, changing to carmine-rose, blotched deep blue; ZOMMERSCHOM, salmon-rose, flaked white.

Darwin Tulips (May-flowering). DOROTHY, pale mauve, shaded with white; EARLY DAWN, rosy-lake; GLOW, bright vermilion, with blue centre and white margin; LOVELINESS, satiny-rose, margined with blush; SALMON KING, salmon-rose, shaded with scarlet; THE SULTAN (Fig. 739), shiny maroon-black, handsome; WHITE QUEEN, rosy-white, changing to creamy-white.

FIG. 740. PARROT TULIP.

Parrot Tulips (Fig. 740). COFFEE COLOUR, reddish-brown on a yellow ground; CRIMSON BEAUTY, deep crimson, marked with black; FIRE KING, dark scarlet, striped with gold; PERFECTA, deep yellow, blotched rich scarlet, very showy.

TULLIA. A synonym of **Pycnanthemum** (which *see*).

TUMBLER SPREKELIA. *See* **Hippeastrum Cybister.**

TUPISTRA. *T. nutans* is the correct name of *T. squalida*. To the species described on p. 108, Vol. IV., the following should be added:

Tupistra—*continued.*

T. perakensis (Perak). *fl.* shining purple, fleshy, and having a pure white, disk-like, spreading, flat stigma, in erect spikes. *l.* narrower and more beautiful than those of *T. nutans*. Perak 1900. A somewhat remarkable species.

TURF ASHES. These are from burnt turf, and are of some value when applied to land; but it is a wasteful mode of dealing with turf, which would be far more valuable if dug or ploughed in the ground as turf, as the roots of all plants and trees quickly seize upon such material when placed within their reach. Where turf is burnt all the fibre is destroyed, and the fertilising matter in the ashes is soon lost by the action of wet.

TURNIP. *Sorts.* The following are noteworthy additions to the list given in Vol. IV., pp. 112-3:

CATELL'S SILVER BALL, skin white; round and of model form; an excellent mid-season or late variety. FLAT FORCING, skin white; round, robust, and excellent for forcing or early crop outside. GREEN-TOP STONE, skin green at the top; round, fine shape, and tender; an excellent hot weather variety, and one of the best for summer use. HALF-LONG WHITE FORCING, skin white; pyriform, tender, and of splendid quality; one of the earliest and best varieties. JERSEY LILY, skin white; round, very handsome, fine quality, top short; a fine variety for exhibition or summer use. NEW MODEL, skin white; round, handsome, with short top, and good quality.

TURNIP CABBAGE (*Brassica oleracea Caulo-rapa*). This is generally known as Kohl Rabi or Knol Kohl, and though grown as a field crop in some parts, is a very useful vegetable. The seeds should be sown at the end of March, thinly, and when large enough to handle, planted out about 2½ft. apart each way on good, rich soil. The plants stand drought very well, and when cooked have the flavour of a nice sweet Turnip.

TURNIP FLEA, or TURNIP FLY. This pest of the farmer and the gardener was somewhat fully dealt with in Vol. IV., and little can be suggested by way of prevention or remedies. It has been, however, demonstrated that Charlock wherever it occurs forms a suitable food-plant for the Turnip Fleas while the leaves of the Turnip are growing. It should therefore be rigorously kept down. Other common weeds that serve to tide it over a period are Hedge Mustard and Shepherd's Purse.

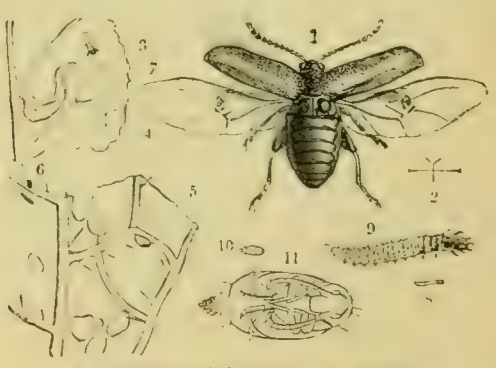


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FIG. 741. TURNIP FLY (*Phyllotreta nemorum*). 1, Beetle, much magnified; 2, Length and wing expanse; 3, Insect, natural size; 4, 5, Egg, natural size and magnified; 6, 7, Tissue and cuticle eaten away by Larva; 8, 9, Larva, natural size and magnified; 10, 11, Pupa, natural size and magnified.

These also should be eliminated. Care should always be taken to use good fresh seed, so that the plants make headway quickly before the Beetles have an opportunity of attacking them. Another method of prevention suggested is to work the land well in the autumn, and then sow the seed in spring. This is also calculated to induce the seedlings to make rapid progress. Fig. 741 shows the Turnip Fly in various stages of its life-history, and magnified as well as natural size.

TURPENTINE. *See* **Silphium terebinthaceum.**

TURPINIA. *T. punctata* is a synonym of **Poiretia scandens** (which *see*).

TURRÆA. *Quivisia chilosantha* is the correct name of *T. rigida*.

TUSSACIA (of Klotzsch). A synonym of **Catopsis** (which *see*).

TUSSOCK. A tuft growing from the ground; *e.g.*, Grasses.

TWINING. Ascending by spirally coiling the stem round some support. *See* **Climbers,** which are distinct from Twiners.

TYLENCHUS. *See* **Onions** (present Volume) and **Nematoid Worms** (Vol. II.).

TYLOPHORA. To the species described on p. 118, Vol. IV., the following should be added:

T. oculata (eyed). *fl.* purple, in short umbellate cymes. *l.* oblong-lanceolate, 3in. long. Stems climbing. Sierra Leone, 1895.

TYPE. A perfect representative of a species or other group.

TYPHLOCYBA ROSÆ. *See* **Rosa—Insects.**

TYPHULA. *See* **Sclerotia.**

TYTONIA. The correct name of *T. natans* is *Hydrocera angustifolia*.

ULMARIA. Included under **Spiræa** (which *see*).

ULMUS. To the species and varieties described on pp. 119-21, Vol. IV., the following should be added:

U. americana pendula (drooping). A "weeping" variety.

U. campestris antarctica aurea (golden). The correct name of *U. c. aurea*.

U. c. aurea is a sub-variety of *U. c. antarctica*.

U. c. globosa (globular). A distinct variety, having leaves like those of the form *Berardi*, but of globular habit. 1894.

U. c. latifolia variegata (variegated). *l.* mottled and striped with silvery-grey.

U. c. microphylla pendula (small-leaved, drooping). A small-leaved, "weeping" form.

U. c. pendula nova (drooping, new). A free-growing, "weeping" variety, with graceful twiggy branches.

U. c. umbraculifera nova (new). This form has smaller leaves and a denser habit than the original *umbraculifera*. 1896.

U. c. viminalis variegata (variegated). *l.* small, pale green, splashed and spotted with white. Very distinct.

U. carpinifolia is synonymous with *U. glabra*.

U. Dampieri aurea (golden). A garden name for *U. fastigiata aurea*.

U. Gaujardii (Gaujard-Rome's). This is described as "an Elm of symmetrical, upright growth, and of great vigour." 1898.

U. montana fastigiata aurea (golden). A golden-leaved form, of erect habit, keeping its colour throughout the season. SYNS. *U. Wredei* (of gardens) and *U. Dampieri aurea* (of gardens). Other forms are *atropurpurea, cinerea, laciniata,* and *macrophylla*.

U. pumila (dwarf). *fl.* small, shortly pedicellate, crowded in fascicles. *l.* small, ovate-lanceolate, serrated, nearly glabrous. Branchlets slender, twiggy, with greyish-yellow marked bark. Siberia. A dwarf shrub.

U. racemosa (racemose). Corky White Elm. *fl.* racemose. April. *fr.* as in *U. americana*, but rather larger. *l.* with veins straighter and simpler. Branches often with corky ridges. Bud-scales downy-ciliated, and somewhat pubescent, as are the young branchlets. North America.

U. suberosa pendula (drooping). A distinct and ornamental "weeping" variety.

U. Wredei (Wrede's). A garden name for *U. montana fastigiata aurea*.

U. crassifolia, U. elliptica, and *U. turkestanica* are rare in cultivation.

UNCARIA. To the species described on p. 122, Vol. IV., the following should be added:

U. sessilifructus (sessile-fruited). *fl.* pale red; heads 1in. in diameter; peduncles 1in. to 1½in. long, axillary and in terminal

Uncaria—*continued.*

panicles. *l.* pale, elliptic, obtuse or obtusely acuminate, 4in. to 4½in. long, shining above, glabrous and rather glaucous beneath; petioles ¼in. long. *h.* 10ft. India, 1829. SYN. *Naucl ea sessilifructus*.

UNCINULA ADUNCA. *See* **Salix—Fungi.**

UNCINULA SPIRALIS. This is a Vine Mildew, described in Vol. IV. under the name of *Oidium Tuckeri*. *See* **Vine Mildew.**

UNDERGROUND BEAN. *See* **Voandzeia subterranea.**

UNDERGROUND ONION. *See* **Potato Onion.**

UNDULATE. Wavy. A term applied to leaves which have their margins alternately convex and concave.

UNGERNIA (named in honour of Baron Ungern-Sternberg). ORD. *Amaryllideæ*. A small genus (about three species) of hardy, bulbous, Asiatic plants, differing from *Lycoris* in the numerous ovules and discoid seeds. Flowers many in an umbel; perianth regular, the tube funnel-shaped, the segments oblong, keeled with many close, green ribs; stamens inserted in two rows near the throat of the tube; peduncle solid; spathe valves two. Leaves lorate, not produced with the flowers. Only one species is known in gardens. For culture, *see* **Amaryllis.**

U. trisphæra (three-sphered). *fl.* reddish; perianth 1in. to 1¼in. long, the segments acute; umbel six- to fifteen-flowered, the central flowers erect, the outer ones rather inclined; peduncle 6in. to 12in. long. Summer. *l.* lorate. Bulb 3in. in diameter, the tunics produced 6in. above its neck. Turkestan, 1886. SYN. *Lycoris Sewerzowi* (R. G. 914).

UNIOLA. To the species described on p. 123, Vol. IV., the following should be added:

U. Palmeri (Palmer's). *fl.*, raceme of staminate plants 6in. to 9in. long, the branches in twos and threes, the spikelets small, seven- to nine-flowered; raceme in fertile plants denser, 4in. to 6in. long, the branches nearly sessile. *l.* erect, involute, with a long, pungent apex. Culms rigid, cane-like, 2ft. to 4ft. high, leafy to the top. United States. Hardy. (G. & F. 1889, p. 400, f. 124.)

UNTRUE. A term applied to seeds that produce spurious varieties, or to trees that do not prove true to name when they flower or fruit; and plants that "sport" in their produce are known as Untrue.

UPATA. A synonym of **Avicennia** (which *see*).

URANTHERA. A synonym of **Acisanthera** (which *see*).

URCEOCHARIS (name compounded of parts of *Urceolina* and *Eucharis*). ORD. *Amaryllideæ*. This name has been given by Dr. Masters to an interesting and beautiful hybrid between *Urceolina pendula* and *Eucharis grandiflora*, raised by Messrs. Clibran. For culture, *see* **Eucharis.**

U. Clibrani (Clibran's).* *fl.* pure white, intermediate in character, stalked, umbellate, 2½in. long, the slender tube expanding into a cup-shaped limb; segments slightly acute; stamens six, nearly as long as the segments. Summer. *l.* broadly ovate, acute. 1892. (G. C. 1892, xii., p. 214, f. 36.) SYN. *Eucharis Clibrani*.

UREDO. *See* **Rosa—Fungi.**

URGINEA. To the species described on pp. 124-5, Vol. IV., the following should be added:

U. capitata (headed). The correct name of *Ornithogalum capitatum*.

U. eriospermoides (Eriospermum-like). *fl.*, perianth oblong, ⅛in. long, the segments whitish, with a broad, brown keel; raceme 1ft. long; peduncle slender, stiffly erect, 1ft. long. July. *l.* two, contemporary with the flowers, only one fully developed, cylindrical, glossy, ¼in. in diameter. Bulb ovoid, ¼in. in diameter. 1887. According to Baker ("Flora Capensis") this is probably *Drimia anomala*.

U. macrocentra (large-spurred). *fl.*, perianth ¼in. long, the segments white, tipped green; lowest bracts having a convolute, scariose spur ¾in. to 1in. long; raceme dense, 5in. to 6in. long, 1in. in diameter; peduncle stout, erect, 2½ft. to 3ft high. May. *l.* solitary, cylindrical, erect, 1½ft. long. 1887.

UROMYCES APPENDICULATUS. *See* **Pea—Fungi.**

UROMYCES FABÆ. *See* **Broad Bean Rust.**

FIG. 742. UTRICULARIA LONGIFOLIA FORGETIANA.

UROPAPPUS. A synonym of **Microseris** (which *see*).

UTRICULARIA. To the species described on pp. 127-8, Vol. IV., the following should be added:

U. Forgetiana (Forget's). A form of *U. longifolia.*

U. ianthina (violet).* *fl.* pale blue, large, the rounded-convex part of the lower lip marked with two vertical golden bands edged with deep violet. *l.* reniform. Brazil, 1896. Stove. In a natural state this is found growing in the leaf-axils of a Tillandsia. (B. M. 7466.)

U. latifolia (broad-leaved). A name used erroneously for *U. longifolia Forgetiana.*

U. longifolia (long-leaved). *fl.* mauve, marked with a small golden blotch on the palate; scapes short, erect. *l.* strap-shaped, long, bright green. British Guiana, 1893. A semi-aquatic, stove species. SYN. *U. rhyterophylla* (of gardens).

U. l. Forgetiana (Forget's).* *fl.* violet-blue, nearly 2in. across, borne on tall scapes. Brazil, 1897. See Fig. 742, for which we are indebted to Messrs. Sander and Sons. Miscalled *U. latifolia* (Gn. 1897, lii., t. 1132).

U. major (greater). The correct name of *U. neglecta.*

U. rhyterophylla (wrinkled-leaved). A garden synonym of *U. longifolia.*

UVA GRASS. *See* **Gynerium saccharoides.**

UVULARIA. *U. chinensis* is a synonym of **Disporum pullum** (which *see*).

V-MOTH (*Halia vauaria*). This is another of the pests of Gooseberries and Currants. The Moth (Fig. 743) is on the wing in summer, and is quite one of the

FIG. 743. V-MOTH (nat. size).

commonest to be met with. The larvæ (Fig. 744) are variable as to colour—green, bluish-green, or grey with wavy yellowish lines upon the back, and a few black spots and a pale yellow stripe at the sides. They are sparsely

FIG. 744. LARVA OF V-MOTH.

hairy. Helleborc dusted on the foliage in the early morning, or spraying the bushes with an arsenite, is the best remedy to employ. *See also* **Ribes—Insects.**

VACCINIUM. To the species described on pp. 128-31, Vol. IV., the following should be added:

V. Arctostaphylos (of Willdenow) is synonymous with *V. padifolium* (*maderense*). The true *V. Arctostaphylos* (of Linnæus) is figured in B. M. 974.

V. brasiliense (Brazilian). A synonym of *Gaylussacia Pseudo-Vaccinium.*

V. carnosum (fleshy). A synonym of *V. crassifolium.*

V. erythrocarpum (red-fruited). *fl.* flesh-coloured, solitary in the axils, about ½in. long; pedicels long, filiform. Early summer. *fr.* bright red, nearly black at maturity, slightly acid. *l.* deciduous, membranous, oblong-lanceolate or ovate-

Vaccinium—*continued.*

oblong, acuminate, finely bristle-toothed, 1½in. to 3in. long. *h.* 1ft. to 4ft. high. A divergently branching shrub. (B. M. 7413.) SYN. *Oxycoccus erythrocarpus.*

V. fuscatum is a form of *V. corymbosum.*

V. hirsutum (hairy). *fl.* white or obscurely rose-coloured, pubescent with spreading hairs. *fr.* bluish-black, hairy. *l.* deciduous, entire, ovate, pubescent-hairy (as well as the branchlets), becoming brick-red in late summer, and persisting thus for several weeks. *h.* 1ft. to 2ft. (G. & F. 1889, p. 365, f. 119.)

V. intermedium (intermediate). A hybrid between *V. Myrtillus* and *V. Vitis-Idæa.* Europe. (J. L. S. xxiv., p. 125, t. 3.)

V. nitidum decumbens (decumbent). A synonym of *V. Myrsinites.*

V. padifolium (Padus-leaved). The correct name of *V. maderense.* (B. M. 7305.)

V. prunifolium (Prunus-leaved). A synonym of *V. ovatum.*

V. Vitis-Idæa. The variety *major* is taller than the type, distinct and ornamental. There is also a variegated variety.

The following are rare in cultivation: *V. ciliatum, V. japonicum, V. parvifolium, V. vacillans.*

VAGARIA. SYN. *Vaginaria.* ORD. *Amaryllideæ.* A monotypic genus. The species, *V. parviflora* (SYN. *Pancratium parviflorum*) is a half-hardy, bulbous plant, with small, greenish flowers; it was introduced into gardens in 1815, but is probably no longer in cultivation.

VAGINARIA. A synonym of **Vagaria** (which *see*).

VALLARIS. *V. Pergulana* is the correct name of *V. Pergularia.*

VALLESIA. *V. cymbæfolia* is the correct name of *V. dichotoma.*

VALLOTA. To the species and varieties described on p. 132, Vol. IV., the following should be added:

V. hybrida (hybrid).* A beautiful hybrid between *V. purpurea* and *Cyrtanthus sanguineus.* Alike as to flowers and foliage the hybrid is intermediate between the two parents. The flowers are bright vermilion and borne in umbels.

V. purpurea delicata (delicate). *fl.* of a delicate salmon-pink tint. 1893.

VALORADIA. A synonym of **Ceratostigma** (which *see*).

VANCOUVERIA (from Fort Vancouver, California). ORD. *Berberideæ.* A small genus (two species) of hardy, creeping, rhizomatous, perennial herbs, natives of North America, and closely allied to **Epimedium** (which *see* for culture). One of them is grown in our gardens.

V. hexandra (six-anthered). *fl.* lilac; sepals indefinite, imbricated; petals six, shorter than the inner sepals, long-clawed; stamens six, free; scape leafless, racemose or sub-paniculate at apex. May. *l.* pinnately twice or three times trisected. *h.* 9in. 1827. SYN. *Epimedium hexandrum.*

VANDA. One of the most remarkable additions to the Vandas since Vol. IV. was issued is the garden-raised hybrid Miss Joaquim. It was obtained from the intercrossing of *V. teres* and *V. Hookeriana* (Fig. 745), and it is a most remarkable plant. In this hybrid vigorousness has been increased threefold, and this is well seen in the racemes of flowers, which have the intermediate characteristics of the parents in shape. In the colour *Vanda teres* predominates. The hybrid referred to requires an abundance of light, and the same conditions generally found suitable for *V. teres.*

To the species and varieties described on pp. 133-6, Vol. IV., the following should be added:

V. Amesiana (Ames').* *fl.* creamy-white, with a rich rosy hue mostly on the lip (which changes, when the flowers begin to fade, into light yellow), deliciously perfumed, thin and delicate in texture; sepals and petals cuneate-oblong, blunt-acute; side laciniæ of the lip small, nearly square, the middle one reniform, bilobed; spur conical, empty; inflorescence one- to twelve-flowered. *l.* lorate, complicate. India, 1887. A charming species. (B. M. 7139; W. O. A. vii., t. 296.) There is also a white variety (*alba*).

V. Arbuthnotiana (W. N. Arbuthnot's). *fl.* golden-yellow, transversely striped with purple, 2½in. by 1½in., having the mid-lobe of the lip pandurate. *l.* thinner than is usual, bilobed at apex. Malabar, 1892. Allied to *V. Roxburghii.*

V. Batemanni is synonymous with *Stauropsis lissochiloides.*

V. Bensoni tristis (sad). *fl.* sulphur-yellow outside, dirty brown within; lip whitish-yellow, with green side lobes. 1896.

Vanda—*continued.*

FIG. 745. FLOWER OF VANDA HOOKERIANA.

V. Boxallii (Boxall's). A name applied to varieties of *V. cærulescens* and *V. lamellata.*

V. brunnea (brown). *fl.* olive-brown on the inner surface, about as large as those of *V. concolor*; sepals and petals elongated-cuneate, obtuse; lip pale yellowish-white; spur long, conical, acute. July. *l.* long, ligulate, toothed. Habitat not recorded; introduced before 1893.

V. cærulea Peetersiana (Peeters'). *fl.* white, rose-tinted, large, devoid of any blue shade. Khasia, 1897.

V. c. Rochfordiana (Rochford's). *fl.* nearly white, tinted with rose on the lip. The type is shown in Fig. 746.

V. c. grandiflora is a large-flowered form.

FIG. 746. VANDA CÆRULEA
(Much reduced).

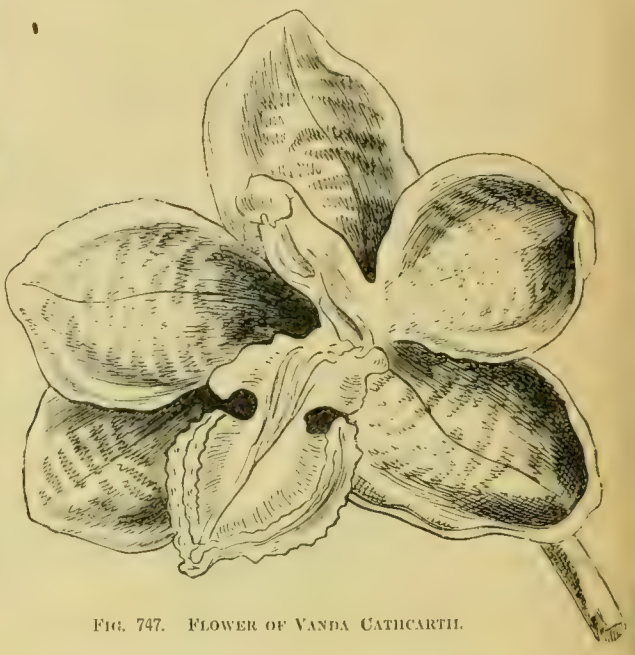


FIG. 747. FLOWER OF VANDA CATHCARTII.

V. Cathcartii (Cathcart's). This very striking Vanda, described in Vol. IV., is illustrated at Fig. 747.

V. Clarkei (Clarke's). A synonym of *Arachnanthe Clarkei.*

V. Dearei (Deare's). *fl.* yellow; sepals and petals shortly stalked, elliptic, obtuse; lip with small, squarish side lobes, and a broad, transverse, pandurate front lobe, the conical spur having a short, rounded, grooved crest over the front of its mouth. Sunda Isles, 1886. Allied to *V. tricolor.*

V. densiflora. According to the "Flora of British India, this is the correct name of *Saccolabium giganteum.*

V. furva (dark). The correct name of *V. fuscoviridis.*

V. Goweri is a garden name for *Stauropsis undulatus.*

V. Griffithii is synonymous with *V. alpina.*

V. Kimballiana (W. S. Kimball's).* *fl.* 1½in. to 2in. across; upper sepal and petals white or faintly flushed with purple, purple-nerved; lateral sepals white, falcate; side lobes of the lip yellowish, spotted with reddish-brown on the inside, ending in an incurved tendril, the middle one amethyst-purple, with three keels; spur pale purple, incurved, nearly 1in. long; peduncles eight- to twelve-flowered. *l.* sub-cylindric, 6in. to 9in. long, bronzy. Shan States (at 4000ft. to 5000ft.), 1889. (B. M. 7112; G. C. 1889, vi., pp. 294, 335, f. 50; Gn. 1890, xxvii., t. 747.)

V. K. Lackneræ (Mrs. Lackner's). *fl.* snow-white, with light yellow spots at the mouth of the spur. 1894. (R. G. 1894, t. 1428.)

V. Lowii (Low's). A synonym of *Arachnanthe Lowii.*

V. multiflora (many-flowered). A synonym of *Acampe multiflora.*

V. pedunculatis (pedunculate). A synonym of *Cottonia macrostachya.*

V. Rœblingiana (Rœbling's). *fl.* 2in. across, two to six to a peduncle; sepals and petals brown and green; lip white, with purple and yellow streaks, the apex dilated into a pair of halbert-shaped lobes. *l.* linear-oblong, recurved, 6in. long Stem 1ft. high. Malaya, 1894. Allied to *V. limbata.*

Vanda—*continued.*

V. Roxburghii unicolor (one-coloured). A synonym of *V. concolor.*

FIG. 748. FLOWERS OF VANDA SANDERIANA.

V. Sanderiana albata (whitish).* *fl.*, upper sepal and petals quite white, with a few purple dots at the base, the lateral sepals red-nerved; hypochil sulphur, striped brownish-purple, the anterior lacinia brownish-sulphur (sometimes purple-striped) at base. 1887. The handsome type is shown at Fig. 748.

V. spathulata (spoon-shaped). *fl.* golden-yellow, 1¼in. across; sepals and petals spathulately oblong; lip clawed, with very small side lobes and an obscurely trifid mid-lobe; peduncle 1ft. to 1½ft. high, few-flowered. *l.* 2in. to 4in. long, obtusely bilobed. Stem 2ft. high. India.

V. suavis. This well-known plant, now regarded by some as a variety of *V. tricolor*, is shown at Fig. 749, for which we are indebted to the "Gardeners' Chronicle."

V. s. magnificens (magnificent).* *fl.* larger and more richly coloured than in the type. 1886. (L., t. 60.)

V. s. rubra (red). *fl.*, sepals and petals suffused with orange; lip red. Java. A distinct variety. (I. H. xxxii., t. 579.)

Vanda—*continued.*

V. s. Veitchii (Veitch's).* *fl.* very strongly scented; segments cinnamon-yellow, with very dark spots, pinkish on the edges; middle lobe of the lip of a beautiful bright pink. 1894. Very floriferous

FIG. 749. VANDA SUAVIS.

V. superba (superb). A name applied to a form of *V. lamellata Boxallii.*

FIG. 750. VANDA TERES.

Vanda—*continued.*

V. teres alba (white). A synonym of *V. t. candida*. The type is shown at Fig. 750.

V. t. gigantea (gigantic).* *fl.* large and richly coloured. Stems and leaves stouter than in the type. 1896.

V. tricolor formosa (beautiful). *fl.*, sepals and petals bright yellow, uniformly covered with rows of oblong, reddish-brown spots.

V. t. Hoveæ (Mrs. Howe's). *fl.*, sepals and petals yellowish, thickly spotted with red; lip rose-crimson. (L. ix., t. 396.)

V. t. Lewisii (Lewis's). *fl.* light-coloured, spotted with reddish-brown. 1894.

FIG. 751. VANDA TRICOLOR PATERSONI.

V. t. Patersoni (Paterson's). This beautifully-marked variety is shown at Fig. 751.

V. t. prætexta (bordered). *fl.*, sepals and petals light sulphur-yellow, bordered with pale rose, and with scattered oblong spots.

V. t. Wallichii (Wallich's). *fl.*, sepals and petals yellow, spotted with brown; lip lilac. 1893. (R. H. 1893, p. 328.)

V. undulata. The correct name is *Stauropsis undulatus*.

V. vitellina (egg-yellow). This species very closely resembles *V. cærulescens Boxallii*, but the flowers are very small, and yellow like the yolk of an egg. Habitat not recorded, 1892.

V. Wightiana (Wight's). A synonym of *Acampe Wightiana*.

Hybrid.

NAME.	PARENTAGE AND RAISER.
Miss Joaquim	*teres* and *Hookeriana* (Joaquim).

Natural Hybrids.

NAME.	PARENTAGE.
amœna	*Roxburghii* and *cærulea*.
Charlesworthii	*cærulea* and *Bensoni*.
Moorei	*cærulea* and *Kimballiana*.

VANESSA. Except perhaps the Whites, there are no Butterflies so much associated with gardens as the bright-coloured members of this genus. It is, however, not in the light of pests, but rather as beautiful additions that the majority are viewed, as evidenced by the encouragement it is proposed by certain local authorities to give the species in town gardens. On one or two occasions perhaps the, as a rule, scarce Tortoiseshell (*V. polychloros*) has proved troublesome to the fruit-grower. Against that, however, must be set the fact that most species feed upon the common Nettles, and on this account are to be regarded as benefactors—*V. urticæ* (Fig. 754) and *V. Io* (Fig. 755) for instance. Only three species of the seven are at all common—the two last-mentioned and *V. atalanta* (Fig. 757). The others,

Vanessa—*continued.*

V. C-album, or Comma (Fig. 752); *V. Cardui*, or Painted Lady (Fig. 758); *V. polychloros*, or Large Tortoiseshell

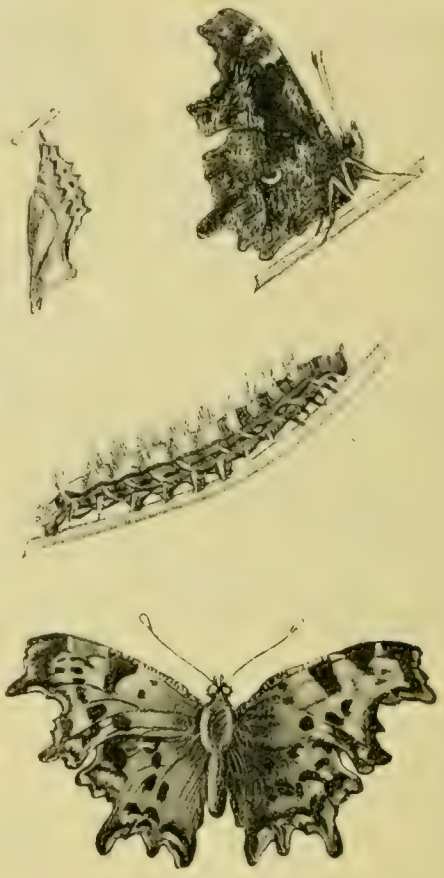


FIG. 752. VANESSA C-ALBUM.

(Fig. 753); and *V. antiopa*, or Camberwell Beauty (Fig. 756), are rarely seen, especially the last-named. In this genus the males and females are not readily differentiated.

In gardens, whether in town or in country, most of the species are to be found. To distinguish them with wings outspread is easy enough, as then the gorgeousness of colouring for which they are remarkable is displayed to the full; but when at rest with wings closed, so well are the insects "protected," that despite their size they are only seen by those with a trained eye.

The caterpillars vary somewhat in colour and in the arrangement of the dots, or lines, or both, with which they are marked, but they are all alike in being adorned with spines. The caterpillar of the Large Tortoiseshell (Fig. 753) feeds on the Elm—for which reason the perfect insect is sometimes called the Elm Butterfly—and also on the Willow, which is the food-plant of the larva of the Camberwell Beauty. That of the Comma (Fig. 752) feeds on various plants, the Hop, Red Currant, Elm, Willow, and Nettle being amongst them. The Painted Lady larva (Fig. 758) affects Thistles and the Nettle; while the other three keep almost entirely to the latter. All the caterpillars are somewhat conspicuous, and therefore readily found.

The pupæ of all the Vanessas are similar in form, being very angular, and adorned with metallic, usually golden, spots. They are suspended by their anal extremities, without any covering whatever to protect them from the weather; indeed, such a covering would

Vanessa—*continued.*

be quite unnecessary, as the pupal state is passed in the height of summer.

The perfect insects are on the wing during the later months of summer and the early autumn. As the cold weather approaches, they retire to some sheltered spot, and there hibernate during the winter, appearing again towards the end of spring, when the eggs are laid which are to produce the summer's brood.

In a few solitary instances Vanessas make their appearance even in mid-winter. When this is the case it is usually an individual that has hibernated in a house, and been aroused from its winter sleep by the warmth of the surroundings; or it may be, in the case of specimens outside, that an usually mild, warm day in winter has misled them, and caused them to emerge from their winter retreat.

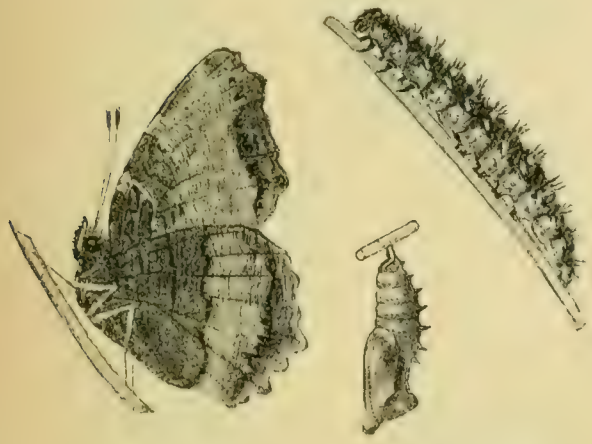


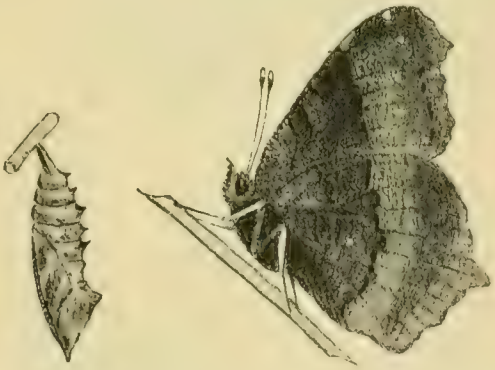
FIG. 753. VANESSA POLYCHLOROS.

In Vol. IV., five species only of the Vanessas were described. *V. C-album* (Fig. 752) is gradually disappearing from this country. It is uncertain whether *V. C-album* is single- or double-brooded. The winter is passed in the perfect state, and the butterflies reappear about May. They are seen from that date onwards, but the chief flight occurs in September and October. The larvæ, which feed principally on the Hop (*Humulus Lupulus*), the common Nettle (*Urtica dioica*), and the Red Currant (*Ribes rubrum*), may be found in July and August, and perhaps in the spring, while the pupæ occur in September, if not before also.

Vanessa—*continued.*

FIG. 754. VANESSA URTICÆ.

V. C-album (Fig. 752) has the costal margin of the forewings nearly straight, and the hind-margin of all the wings very jagged; while the inner margin of the forewings has a deep hollow. The colour of the upper surface



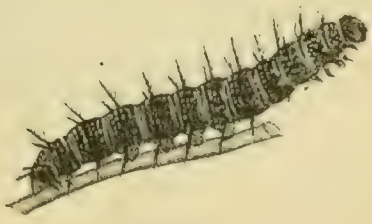


FIG. 755. VANESSA IO.

Vanessa—*continued.*

is brownish-orange, with a broad band of redder brown along the hind-margin of the wings. The fore-wings have

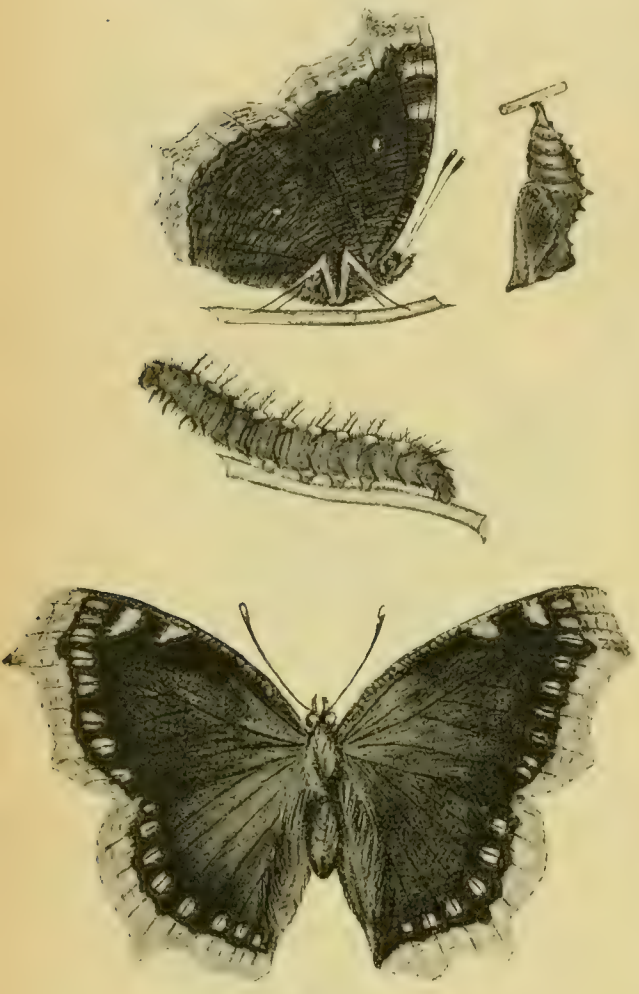


FIG. 756. VANESSA ANTIOPA.

seven dark brown spots; the hind-wings have three brown spots near the base, and an extra band of brown. The under-surface (Fig. 752), which is mottled with

Vanessa—*continued.*

brown, has on each hind-wing a white mark resembling a comma, or C, which gives the insect its name.

V. Cardui (Fig. 758) in some seasons may be particularly scarce throughout the kingdom, and altogether absent from many localities; while in other seasons again it occurs quite plentifully. In 1892, after the appearance of a considerable number of hibernated specimens in the spring, entomologists were delighted to find a corresponding abundance of the fresh brood in the autumn. It may be found throughout Great Britain and Ireland.

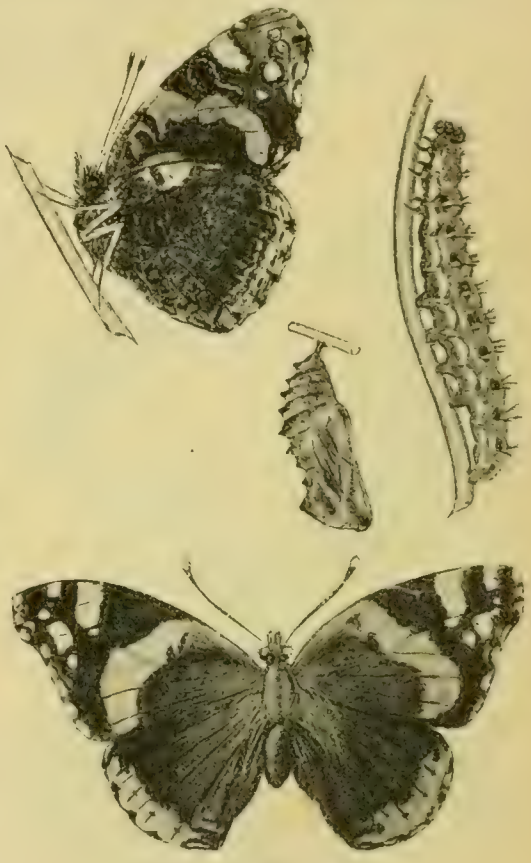


FIG. 757. VANESSA ATALANTA

The ground-colour of *V. Cardui* consists of various shades of reddish-brown, irregularly marked with black. There are five white spots near the tip of the fore-wings,

FIG. 758. VANESSA CARDUI.

Vanessa—*continued.*

and five black ones near the margin of the hind-wings. On the under-surface (Fig. 758) the fore-wings are marked much in the same way, but in somewhat lighter tints. The hind-wings are delicately pencilled with brown and cream, and there are five beautiful eye-spots corresponding to the five black spots on the upper surface. Contrary to usual custom, the under-surface is more beautiful than the upper.

VANGUERIA. *V. madagascariensis* is the correct name of *V. edulis.*

VANILLA. To the species described on p. 137, Vol. IV., the following should be added:

V. grandiflora (large-flowered). A synonym of *V. Pompona.*

V. Humblotii (Humblot's). *fl.* very large; sepals ligulate-acute; petals rhombic, broad, acuminate; lip rhombic, blunt, angled, undulated in front, with a dark, ribbon-like zone over the front part of the disk, and numerous strong, twisted hairs scattered from base to disk; raceme many-flowered. Tropical Africa, 1885. A leafless species.

V. Pompona (Pompona). The correct name of *V. lutescens.* SYN. *V. grandiflora.*

V. Roscheri (Roscher's). *fl.* white, large; sepals lanceolate-oblong, 3in. to 3¼in. long; petals as long and rather broader; lip entire, undulated, 2½in. to 2⅝in. long; column 1in. long; pedicels 1½in. long; racemes pedunculate, many-flowered. Stem stout, leafless. Mozambique.

V. Walkeræ (Mrs. Colonel Walker's). *fl.* white, 2in. long; sepals oblanceolate; petals broader, acute, with undulated margins; epichil ovate, acute, with undulated margins, the disk having two ridges below the middle; racemes 5in. to 6in. long, many-flowered. Stem as thick as the thumb and leafless. India.

V. Wightiana (Wight's). *fl.* 1in. to 1¼in. long; sepals and petals pale yellow, tipped with green, linear-oblong; lip three-lobed, with a hairy, reddish-purple crest. Stems leafless. Southern India, 1899.

VARENNEA. A synonym of **Eysenhardtia** (which *see*).

VARIEGATED LAUREL. *See* **Aucuba.**

VEGETABLE. Although this term is properly applicable to any plant, yet in a horticultural sense it is applied only to such plants as are cultivated for some part which is edible when cooked.

VEGETABLE WAX. A protective, wax-like substance on many leaves and fruits.

VELLEIA. To the species described on p. 139, Vol. IV., the following should be added:

V. lanceolata (lanceolate). A synonym of *Goodenia filiformis.*

V. Salmoniana (Dr. George Salmon's). This species in general appearance resembles *Goodenia filiformis*, but, of course, differs in botanical details. 1893.

VELVETY MOULD (*Sclerotinia Fuckeliana*). A destructive disease of the Grape Vine, the conidial, or "mould" form of which is very well known. Reference has been made to this fungus under **Sclerotia** and **Peziza** in Vol. III. The fungus does not confine itself to the Vine, but is found on a large number of plants. All parts of the Vine are affected, but the greenish-brown mould is usually first discovered upon the foliage.

The Grape-grower should spray with a solution of sulphide of potassium, in the proportion recommended under **Fungicides,** directly the disease is discovered. Later, affected berries and leaves should be burned, otherwise the sclerotia that may be found thereon will tide the disease over the winter, to appear again the following season.

VENICE SUMACH. *See* **Rhus Cotinus.**

VENIDIUM. To the species described on p. 141, Vol. IV., the following should be added:

V. calendulaceum (Marigold-like). A garden synonym of *V. fugax.*

Venidium—*continued.*

V. fugax (fugacious). *fl.-heads* 1½in. in diameter; ray bright orange, a little paler beneath; disk blackish. *l.*, radical ones petiolate, elliptic, obtuse, sinuate, lobed, or sub-lyrate, generally without auricles; upper ones sessile, sometimes slightly auricled at base, entire or sinuate-toothed, the lower ones somewhat pandurate. *h.* 1½ft. 1887. Stem, leaves, and involucral scales shortly hairy. Hardy annual. SYN. *V. calendulaceum* (of gardens).

V. hirsutum (hairy). *fl.-heads* 1½in. to 1⅝in. in diameter; ray bright orange-yellow, but not so deep as in *V. fugax*; disk blackish. *l.* lyrate-pinnatifid; radical ones petiolate, with large, broadly elliptic-oblong, deeply-lobed terminal lobes, the petioles scarcely or not at all auricled; uppermost ones much smaller, sessile, pinnatifid. *h.* 10in. to 12in. Stem, leaves, and outer involucral scales hairy. Hardy annual. SYN. *V. speciosum* (of gardens).

V. speciosum (showy). A garden synonym of *V. hirsutum.*

VERATRUM. *V. viride* is now given specific rank.

VERBASCUM. To the species described on pp. 143-4, Vol. IV., the following should be added:

V. crassifolium (thick-leaved).* *fl.* yellow, large, fascicled; raceme dense, spicate. *l.* crenulate, downy-woolly; cauline ones long-decurrent. Portugal. A pretty, densely yellowish-tomentose biennial.

V. longifolium (long-leaved). *fl.* golden-yellow, shortly pedicellate; corolla 1in. broad; inflorescence sessile, 1ft. high, dense-flowered. July. *l.* very numerous, densely superposed; lower ones 1½ft. to 2ft. long. *h.* 3ft. to 4ft. Southern Italy and the Balkans, 1898. A stately, hairy-tomentose annual. (B. M. 7707.)

V. l. pannosum (rag-like). *fl.* in a rather loose raceme. July. *l.* thick. Whole plant softly and densely white-tomentose. This plant was formerly classed as a species.

V. phœniceum. Of this species (which is a perennial) there are numerous colour varieties, ranging from white through lilac and rose to violet and purple.

V. Wiedemannianum (Wiedemann's). *fl.* changing from indigo-blue to purplish-lilac, 1¼in. broad, solitary, in very long racemes. *l.* woolly; radical ones 3in. to 5in. long, oblong or elliptic, crenate or sub-entire, narrowed to the petioles; cauline ones small, sessile. *h.* 1ft. to 3ft. Orient, 1893. Biennial.

VERBENA. Named varieties are not usually cultivated now, such having been superseded by the fresh strains in the hands of florists. Crimson Gem, Tresserve, and Uranie are, however, good varieties if the former are preferred.

VERBESINA. To the species described on pp. 146-7, Vol. IV., the following should be added:

V. aurea (golden). A synonym of *Zexmenia aurea.*

V. Coreopsis (Coreopsis-like). A synonym of *Actinomeris squarrosa.*

V. gigantea (gigantic).* *fl.-heads* white, ovate-oblong; corymb compound. *l.* large, winged, glistening, delicate green, alternate; lower ones decurrent; upper ones sessile, amplexicaul, pinnatipartite. Stems round, green. Jamaica. Tender; useful in a young state for bedding.

V. Mameana (Mame's).* *l.* 3½ft. long, 2ft. broad, ovate, acute, cuneiform at base; cut into large, slightly-toothed lobes, slightly hairy above. *h.* 6ft Ecuador, 1885. A fine, half-hardy plant. (R. H. 1885, f. 5; 1895, f. 101.)

V. occidentalis (Western). The correct name of *Actinomeris alata.*

V. sativa is synonymous with *Guizotia abyssinica* (*oleifera*) (described on p. 152, Vol. IV., as *Vestingia sativa*).

VERNONIA. To the species described on p. 147, Vol. IV., the following should be added:

V. acutifolia is synonymous with *V. sericea.*

V. altissima (tallest). *fl.-heads* purplish-violet, ¼in. high or less, usually in a loose or open cyme. September to November. *l.* thinnish, veiny, lanceolate or lanceolate-oblong, denticulate, shortly petiolate, glabrous above, pubescent beneath. *h.* 5ft. to 10ft. North America, 1820. An excellent perennial for the

Vernonia—*continued.*

wild garden even when its flowers are not produced. SYN. *V. præalta.*

V. Cotoneaster (Cotoneaster). The correct name of *V. axilliflora.*

V. podocoma (hairy-stalked). *fl.-heads* rose-purple, loose, arranged in a terminal panicle which on strong plants is 3ft. long and nearly as broad; florets ½in. long. *l.* large, coriaceous. Branches, stalks, and under-surface of leaves pubescent or tomentose. South Africa, 1892. A tall-growing, greenhouse plant. (B. M. 7255.)

V. præalta (very tall). A synonym of *V. altissima.*

V. scabra (rough). The correct name of *V. odoratissima.*

VERONICA. Though many of the New Zealand species are reputedly hardy, numbers need a sheltered position outside to grow them safely, or else a cool greenhouse. Tender kinds are *anomala, diosmæfolia, pimelioides, parviflora, elliptica,* and several others.

To the species described on pp. 148-50, Vol. IV., the following should be added. They are hardy and of perennial duration, except where otherwise specified:

V. aphylla (leafless). *fl.* blue, few in a corymbose raceme; peduncle scape-like, 2in. to 4in. long, slender. May. *l.* ¼in. to 1in. long, somewhat rosulate, shortly petiolate, ovate-elliptic, crenate-serrated or entire. Stem short and creeping or wanting. Alps, &c., 1775. Rockery.

V. Armstrongi (Armstrong's). *fl.* whitish, in terminal, three- to eight-flowered heads. *l.* minute, dimorphic, some long and acute, others broadly ovate and sub-acute, closely adpressed and coriaceous, adnate with the branches for half their length; margins faintly ciliate. *h.* 1ft. to 3ft. South Island, New Zealand, 1888. A much-branched shrub.

V. austriaca (Austrian). *fl.* blue, large, many in elongated racemes. July. *l.* all deeply pinnatifid or pinnatisect; segments linear or nearly oblong, entire or incised. Stem usually erect, pubescent or woolly. *h.* 1ft. South-east Europe, 1748.

V. a. pinnatifida (pinnatifid). *fl.* a deeper blue than in the type.

V. Balfouriana (Balfour's). This species is allied to *V. Traversii,* but is dwarfer, with longer racemes of larger violet-coloured flowers, and smaller ovate-elliptic leaves margined with brown. New Zealand, 1897. (B. M. 7556.)

V. bellidioides (Daisy-like). *fl.* bluish; raceme short, few-flowered, clustered, villous. May. *l.* obovate, obtuse, slightly crenate, those near the base of the stem clustered, the rest opposite and remote. Stem erect, simple. *h.* 6in. Pyrenees, &c., 1775. Plant hairy. Rockery.

V. Bidwillii (Bidwill's). *fl.* violet, white, or pink, racemose or sometimes in interrupted whorls; corolla ¼in. or more across; peduncles axillary, 2in. to 10in. long. *l.* sub-sessile, ⅓in. to ½in. long. Stems prostrate, slender, creeping at base, 3in. to 6in. long, glabrous or puberulous. New Zealand.

V. candida (white). A garden synonym of *V. incana.*

V. canescens (hoary). *fl.* pale blue, showy, solitary, axillary, on slender peduncles. *l.* opposite, ⅓in. to ⅔in. long, shortly petiolate, broadly ovate, usually white-hairy on both sides. Stems 1in. to 2in. long, more or less hispid. New Zealand. A minute, procumbent herb.

V. carnosula (of Hooker). A synonym of *V. pinguifolia.*

V. corymbosa (corymbose). A variety of *V. spicata.*

V. cupressoides variabilis (variable).* This is of dwarfer habit than the type, and forms a dense spreading tuft; it is a capital rock-plant. 1888. (G. C. 1888, iii., p. 20, f. 5, 7.)

V. Dabneyi (Dabney's). This rockery species closely resembles *V. officinalis,* but is larger, with larger flowers, and glabrous except for a few hairs on the young stems. Azores.

V. decumbens (decumbent).* *fl.* white; corolla tube ¼in. long, much flattened on the inner side; racemes twelve- to sixteen-flowered, shortly stalked, in pairs near the tips of the branches. *l.* entire, quite glabrous, very shortly stalked, ovate or lanceolate, obtuse, flat or slightly concave, not keeled, obscurely three-nerved, dull green, with bright red edges. Branches black and polished; branchlets pubescent. New Zealand, 1888. A small, very beautiful, decumbent shrub.

V. Dieffenbachii (Dieffenbach's). *fl.* blue, ¼in. across; racemes axillary, longer than the leaves, ¾in. in diameter. *l.* sessile by a sub-cordate base, 3in. long, 1in. broad, linear-oblong, tough, downy on the edges towards the base. *h.* 2ft. New Zealand, 1898. A stout, glabrous, greenhouse, or half-hardy shrub. (B. M. 7656; G. C. 1898, xxiv., p. 155, f. 41.) See Fig. 759, for which we are indebted to the "Gardeners' Chronicle."

Veronica—*continued.*

V. diosmæfolia trisepala (three-sepaled). *fl.*, sepals very large, two of them often confluent. *l.* less acute than in the type. New Zealand, 1897. Plant very slender. (B. M. 7539.)

V. excelsa (tall). A variety of *V. longifolia.*

V. Fairfieldii (Fairfield's). *fl.* lavender-coloured, in short, erect, branched racemes. *l.* less than 1in. long, ovate, toothed, with a brownish margin. Branches short. New Zealand, 1889. A half-hardy garden hybrid. Allied to *V. Hulkeana.* (B. M. 7323.)

V. fruticulosa (slightly shrubby). *fl.* blue or pink, variable, few in a short, lax, pubescent raceme. July. *l.* ¼in. to ½in. long, oblong or obovate, obtuse, entire or slightly crenate, rather thick, glabrous or pubescent. Stems diffuse, much-branched, often woody at base. European mountains.

V. gentianoides variegata (variegated). A pretty form with light blue flowers and variegated foliage.

V. Godefroyana (Godefroy's). *fl.* white, small, very numerous, in axillary, compact racemes. *l.* ¼in. long, oblong, obtuse, narrowed at base, thick, concave, glaucous. *h.* 1½ft. to 3ft. New Zealand, 1888. Hardy evergreen shrub. "This is probably *V. carnosula*" (Kew Bulletin).

V. Hectori (Dr. Hector's).* *fl.* pale lilac, collected into an ovate, terminal head, with a villous rachis. *l.* closely, but not densely, imbricated, extremely thick and coriaceous, broader than long, broadly ovate or orbicular, very obtuse, nearly ¼in. across, opposite pairs connate to the middle, puberulous along the edges, shining, not keeled. Branches, with the leaves on, obscurely tetragonal or terete. *h.* 6in. to 2ft. Southern Alps of Middle Island, New Zealand, 1883. A beautiful, robust, small, much-branched shrub. (B. M. 7415.)

V. hybrida (hybrid). A variety of *V. spicata.*

V. incisa pedalifida (pedalifid). A variety having light blue flowers and very distinct foliage.

V. Lavaudiana (Lavaud's). *fl.* purple, ½in. across; spikes ½in. to ¾in. long, crowded in a low, spreading corymb 1in. to 2in. broad. *l.* rather crowded, shortly petiolate, ½in. to ¾in. long, broadly obovate-spathulate. Stem decumbent; branches ascending, 4in. to 8in. high. New Zealand, 1892. Greenhouse or half-hardy shrub. (B. M. 7210.)

V. Lewisii (Lewis's).* *fl.* pale purple, white, or blue, ½in. to ¾in. across; racemes in sub-terminal pairs, stout, dense, erect, 2in. long. *l.* pale green, spreading, decussate in rather distant pairs, ovate to oblong, 1in. to 1½in. or more in length, entire, acute, pubescent below. Branches stout, greyish-pubescent. *h.* 3ft. to 6ft. or more. New Zealand. A very handsome shrub.

V. Lindsayi (R. Lindsay's). This name has been given to a plant that is supposed to be a hybrid between *V. amplexicaulis* and *V. pimeleoides.* 1898. (G. C. 1898, xxiv., p. 331, f. 97.)

V. linifolia (Flax-leaved). *fl.* ¼in. across, with a very short tube; peduncles slender, axillary, longer or shorter than the leaves, three- to five-flowered. *l.* rather close-set, spreading, sessile or shortly stalked, ¼in. to 1in. long, linear, obtuse, entire. Branches terete, 2in. to 6in. long. New Zealand. A small, glabrous, leafy species.

V. loganioides (Logania-like). *fl.* white, with pink stripes, very fugacious; calyx lobes lanceolate, acute, keeled, ciliated; corolla lobes broadly ovate; anthers brown. *l.* densely imbricated, appressed to the branches, ovate, acuminate, with spreading tips, usually entire, sometimes with one to three teeth on each side, ¼in. long, sessile, very sharply keeled below, glabrous except the ciliated margins. *h.* 6in. Rangetala Valley, New Zealand (at 5000ft. to 6000ft.), 1888. A small, evergreen shrub, decumbent and rooting at the joints. (B. M. 7404.)

V. longifolia. To this species the varieties *alba* and *rosea* are useful additions.

V. macrocarpa alba (white). A white variety of the type.

V. maritima (sea-loving). A synonym of *V. longifolia.*

V. monticola (mountain-loving). *fl.* blue, small, spicate; corolla twice as long as the calyx. *l.* glabrous, 1½in. to 2in. long, oblong and oblong-lanceolate, acute, dentate-serrate, cuneate at base, the lower ones shortly petiolate. *h.* nearly 1ft. Abchasia, Transcaucasia, 1892. Hybrid; trailing.

V. Nummularia (Moneywort-like). *fl.* blue or pink, smaller than in *V. fruticulosa;* raceme sub-capitate, pubescent. June. Branches densely clothed with leaves which are only ⅛in. long. Stems diffuse, much-branched, creeping. Pyrenees, 1820. Rockery.

V. orchidea is now classed as a distinct species.

V. paniculata is now regarded as synonymous with *V. spuria.*

V. pinnata (pinnate). *fl.* blue, small, in slender, solitary or paniculate racemes. June and July. *l.* scattered or somewhat fascicled, rather thick, shining; lower ones pinnatisect, with

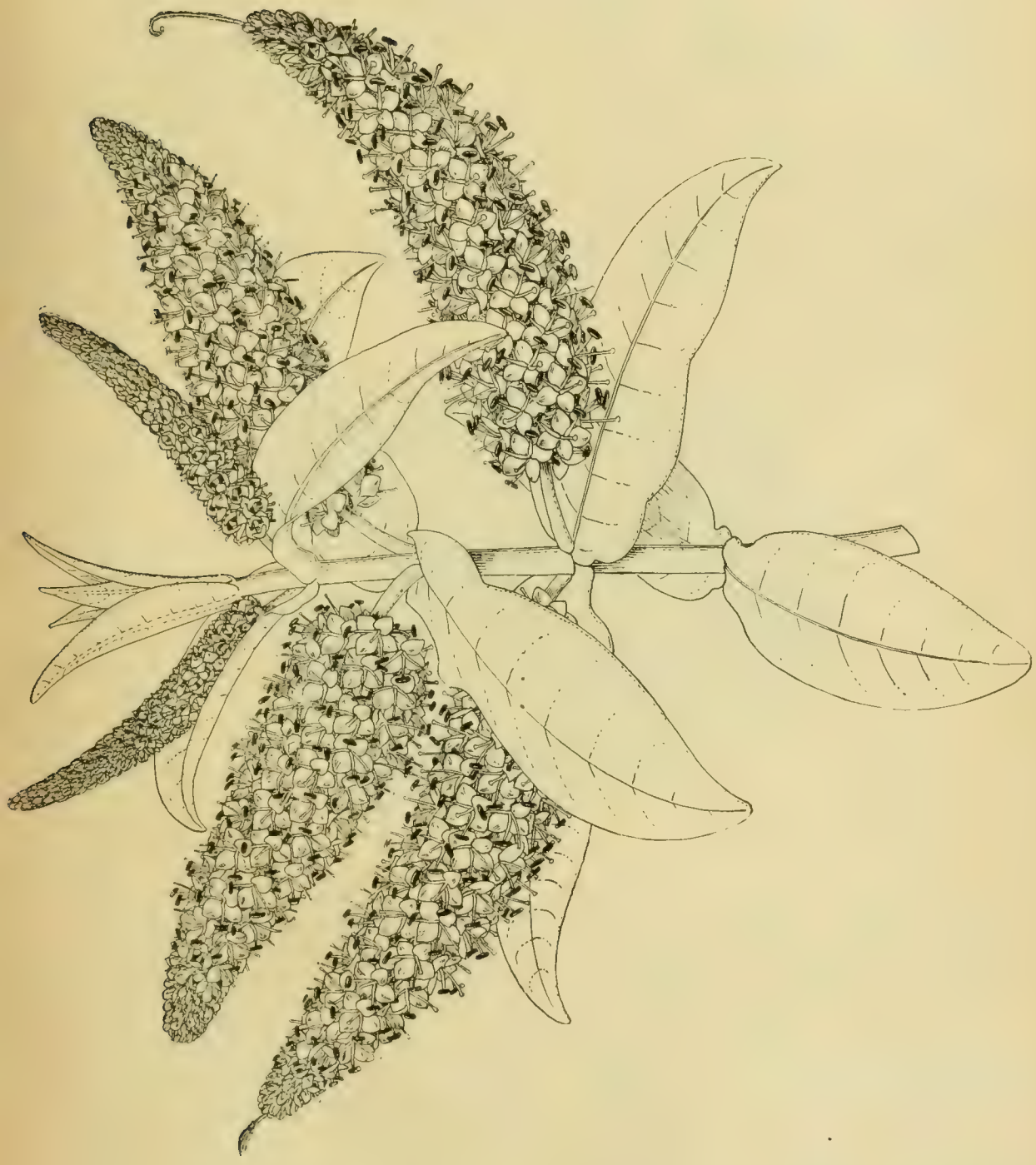


FIG. 759. VERONICA DIEFFENBACHII.

Veronica—*continued.*

subulate, divaricate segments; upper ones pinnatifid or simple and subulate. *h.* 4in. to 2ft. Siberia. Glabrous or hoary-pubescent.

V. rakaiensis (Rakaia). *fl.* pure white, strongly honey-scented, ¼in. across; racemes 1in. to 2in. long, curved, many-flowered. *l.* decussate or laxly imbricated, linear-lanceolate or linear-oblong, shortly petiolate, ¼in. to 1in. long, acute, entire, shining above, pubescent beneath. Branches erect. *h.* 3ft. to 6ft. New Zealand. A slender, bright green shrub.

V. repens (creeping). *fl.* pink or white; corolla twice as long as the calyx; pedicels axillary, one-flowered. September. *l.* ovate or rounded, sessile, entire. Stems slender, creeping. Corsica. A pretty, glabrous species.

V. salicifolia myrtifolia (Myrtle-leaved). A variety having leaves like the Myrtle. Half-hardy.

V. spicata alba (white). A white-flowered form of the type.

V. s. corymbosa (corymbose).* *fl.* profusely borne and continuing long in beauty. A capital rockery plant.

V. s. hybrida (hybrid).* *fl.* varying through pink, lavender, and dark purple. Plant more robust than the type, with broader leaves.

V. spuria (spurious). The correct name of *V. paniculata.* SYN. *V. Verbenæ.*

V. subsessilis (almost stalkless). A variety of *S. longifolia.*

VESLINGIA. *Guizotia abyssinica* is the correct name of *V. sativa.*

VESPA CRABRO. *See* **Hornet.**

VIBORGIA. According to the "Index Kewensis," *Viborgia* is the correct name.

VIBORQUIA. A synonym of **Eysenhardtia** (which *see*).

VIBURNUM. These are useful for forcing into blossom for house decoration during the winter months. For this purpose they should be lifted in October, planted in pots of suitable size, plunged in the open ground, and the most forward ones brought into heat in December. The syringe should be used freely amongst the top growths, and as the flowers develop the plants should be removed to a colder house before transferring them to the conservatory. *V. tomentosum* (*plicatum*) and *V. Opulus sterile* (Figs. 760 and 761) are specially useful for this purpose. To the species and varieties described on pp. 155-7, Vol. IV., the following should be added. They are North American except where otherwise indicated.

V. cassinoides (Cassine-like).* *fl.* yellowish-white, disposed in flat cymes 4in. to 5in. across. June. *fr.* rose-coloured, changing

FIG. 760. VIBURNUM TOMENTOSUM (PLICATUM).

V. syriaca alba (white).* A capital variety, literally covered with flowers in spring.

V. telephiifolia (Telephium-leaved). *fl.*, peduncles slender, ¼in. long, six- to ten-flowered at apex. *l.* thick, obovate-orbicular, ¼in. to ½in. long, petiolate, entire or with one or two teeth. Stems 2in. to 6in. long, creeping or tufted, much-branched, rooting. Armenia, &c.

V. Verbenæ (Verbena-like). A synonym of *V. spuria.*

Other shrubby kinds grown are *V. azurea*, *V. carnea*, *V. Cookiana*, *V. ignota*, and *V. newryensis* (all more or less tender). The following garden varieties should also be included:

BLUE GEM, deep blue; LA SEDUISANTE, deep purple; MERVEILLE (half-hardy); PURPLE QUEEN, purplish-violet; and WHITE STAR, foliage deep green, margined with yellow (needs a warm soil).

VERSAILLES LAUREL. A broad-leaved variety of the common Laurel, **Cerasus Laurocerasus** (which *see*).

to bluish-black, very attractive, profusely produced. *l.* thick, ovate to oblong, coriaceous, opaque, 1in. to 3in. long. *h.* 6ft. 1761. Found naturally in swamps. SYN. *V. squamatum* (W. D. B. i., t. 24).

V. davuricum (Dahurian). *fl.* white; corolla nearly funnel-shaped, obtusely five-toothed; corymbs few-flowered, dichotomous. June and July. *fr.* red, at length black. *l.* ovate, sub-cordate at base, crenulate-toothed, hairy. Branches pubescent. *h.* 3ft. Dahuria, 1785.

V. erosum (bitten). *fl.* in a decompound, pilose umbel; style simple. *l.* broadly ovate, acuminate, erose-serrated, slightly villous on both surfaces; petioles downy. Japan. (G. & F. 1896, p. 85, f. 9.)

V. furcatum (forked). This species is grown principally on account of its large leaves, which in the autumn assume a beautiful scarlet or purple colour. *h.* 12ft. China and Japan.

V. lævigatum (smooth), of gardens. A synonym of *V. prunifolium.*

V. Lentago subpedunculatum (slightly pedunculate). A variety having petioles about ¾in. long. 1889.

V. nitidum (shining). A synonym of *V. nudum.*

Viburnum—*continued.*

V. paucifiorum (few-flowered). *fl.* white; cymes small, terminating short and merely two-leaved lateral branches. Early summer. *l.* roundish or broadly oval, unequally toothed, many of them more or less three-lobed. *h.* 2ft. to 5ft. 1890. A straggling shrub, something like a dwarf *V. Opulus*. (G. & F. 1890, p. 4, f. 1.)

V. plicatum. *See* **V. tomentosum.**

V. pyrifolium (Pyrus-leaved). A synonym of *V. prunifolium*.

V. reticulatum (netted). A garden synonym of *V. Sieboldi*.

V. rigidum (rigid). The correct name of *V. rugosum*.

V. Sargenti (Sargent's). A species very closely allied to *V. Opulus*, but having larger ray flowers and purplish anthers. China, 1899.

V. Sieboldi (Siebold's). *l.* opposite, dark green, flat, thick coriaceous, oblong-oval, obscurely and bluntly serrated towards the apex. Japan. SYN. *V. reticulatum* (of gardens).

V. squamatum (scaly). A synonym of *V. cassinoides*.

V. stellatum (star-like). *l.* strongly veined, oblong-ovate, about 6in. long and 3½in. broad, thick, rugose. Mexico, 1889-90. According to the Kew authorities, this may not be the true *V. stellatum* (of Hemsley).

Vicia—*continued.*

racemes as long as the leaves, dense-flowered. May. *l.* sessile; leaflets sixteen to twenty-four, alternate and nearly opposite, oblong, obtuse, mucronulate, silky-pubescent beneath. Azores. Perennial. (B. M. 6967.)

V. fulgens (brilliant).* *fl.* scarlet, striated with purple, rose-purple at base, shortly pedicellate; spikes compact, erect, 4in. to 5in. long. June to August. *l.* 4in. to 6in. long, terminating in a branched tendril; leaflets opposite or alternate, very shortly stalked, oblong or linear-lanceolate, mucronate. Stems pubescent, 3ft. to 4½ft. high. Algiers, 1892. A pretty annual.

V. galegifolia is synonymous with *Swainsona coronillæfolia*.

V. narbonensis (Narbonne). *fl.* purple, pedicellate, three or four in the leaf-axils. June and July. *l.*, leaflets ample, ovate, entire or slightly toothed; stipules large. Stems tetragonal, hairy, striated. *h.* 3ft. Orient, 1590. Annual. (B. M. 7220.) *V. serratifolia* is a form with deeply-toothed leaflets.

V. oroboides alba (white). A white form of the type.

V. pyrenaica (Pyrenean). *fl.* purple, solitary, sessile; calyx sub-campanulate, the unequal segments lanceolate and somewhat spreading, shorter than the tube. May. *l.* slightly tendrilled; leaflets obcordate, mucronate; stipules semi-sagittate, entire or denticulate. *h.* 1ft. Pyrenees, 1818. Perennial.

FIG. 761. VIBURNUM OPULUS STERILE.

V. Tinus. Other varieties are: *purpureum* (darkest-leaved, suffused with dull purple, neat, free in growth), *pyramidale* (pyramidal), *rotundifolium* (roundish-leaved), and *variegatum* (leaves irregularly variegated with white). Fig. 762 shows the type grown as a Room-plant, for which it is well adapted.

V. tomentosum is now regarded as a species and *V. plicatum* (Fig. 760) as a variety of it.

V. Vetteri (Vetter's). A garden hybrid between *V. Lentago* and *V. nudum*. 1889.

VICIA. To the species described on p. 157, Vol. IV., the following should be added:

V. altissima (tallest). The correct name of *V. polysperma*.

V. biennis (biennial). Siberian Vetch. *fl.* purple; calyx teeth unequal; racemes many-flowered; peduncles scarcely longer than the leaves. July to September. *l.*, leaflets lanceolate, glabrous; petioles tendrilled. *h.* 2ft. Siberia, 1753. Annual or biennial.

V. Dennesiana (Dennes'). *fl.* varying in colour from pale brownish to violet-purple, 1in. long; standard shorter than the wings, which are somewhat reflexed above the middle;

V. sylvatica (wood-loving).* *fl.* blue and white, pedunculate; calyx segments scarcely as long as the tube; peduncle longer than the leaves, many-flowered. June and July. *l.*, leaflets numerous, alternate or opposite, elliptic-oblong, mucronulate, reticulate-veined; stipules semi-sagittate-reniform, bristly-toothed. Europe. A glabrous perennial; good for rambling over rockwork.

VIGNA. To the species described on p. 159, Vol. IV., the following should be added:

V. strobilophora (cone-bearing). *fl.* Wistaria-like, having the standard pinkish-white and the keel and wings purple, disposed in axillary, cone-like racemes. *l.* pinnately trifoliolate. Stems woody, twining, many feet in height. Mexico, 1894. Greenhouse. (G. & F. 1894, f. 30.)

VIGUIERA. To the species described on p. 159, Vol. IV., the following should be added:

V. excelsa (tall). *fl.-heads* yellow; involucral scales in many series, ciliated, appressed; peduncle terete. August. *l.* elliptic, acute, serrated at apex, three-nerved, scabrous on both sides. Stem scabrous. *h.* 6ft. to 8ft. Mexico, 1820. SYNS. *Helianthus giganteus* (of Cavanilles), *Tithonia excelsa*

VILLARSIA. *See also* **Limnanthemum.**

VILMORINIA. This genus is monotypic.

VINCA. Including *Lochnera*. *V. difformis* is the correct name of *V. media*. *V. major alba* is a garden variety with white flowers; *V. m. elegantissima* has blue flowers, and the foliage is blotched with creamy-white; and *V. m. reticulata* has the leaves golden-reticulated. Of the many uses to which the hardier kinds may be put none is more deserving of note than planting them under trees.

FIG. 762. VIBURNUM TINUS.

VINE. To the varieties on pp. 172-6, Vol. IV., the following should be added:

Appley Towers. Fruit quite black, covered with a deep bloom, large, roundish-oval; flesh firm, very juicy, and with a distinct and very agreeable flavour. Bunches large, broad, and of good shape, setting freely. A new variety of much promise. A mid-season or late Grape.

Lady Hastings. A sport from Muscat Hamburgh, possessing the same rich flavour, with a stronger constitution, and stated to set freely.

Lady Hutt. Fruit greenish-yellow, with a firm, delicate bloom, round, medium to large; flesh melting, very juicy, and of rich flavour; skin thin. Bunches medium-sized, with broad shoulders, setting freely. An excellent new late variety.

Primavis Frontignan. Fruit amber, small, round; flesh very firm, juicy, and highly flavoured. Bunches medium, long, well-set. A mid-season Grape.

VINE BOWER. *See* **Clematis Viticella.**

VIOLA. The beautiful garden-plants cultivated under the name of Violas may be said to be quite modern. They had their origin something like forty years ago, at a time when the bedding-out of greenhouse-plants was the leading feature of most of the gardens in England. At that time the popularity of any new plant was assured if it was adapted for bedding-out. Amongst other plants brought into prominence for that purpose was *Viola cornuta* (Horned Violet). This pretty plant had been grown in gardens for nearly a century. It was figured in the "Botanical Magazine" in 1805, Tab. 791, and Dr. Sims, the then editor, stated that the plant

Viola—*continued.*

was introduced to the Royal Gardens, Kew, by Dr. Ortega, in 1776. It is stated to be a native of Spain and Mount Atlas. The flowers are pale blue in colour. The specific name is in allusion to the peculiar formation of the sepals; while the common name of "Tufted" has reference to the habit of the plants. This plant was grown by thousands as a bedding-plant, and it subsequently became cross-fertilised with the Show Pansies. The produce of this cross were grown as Violas. The hardier, more wiry constitution of *Viola cornuta* was transferred to the offspring of this cross, and although the form of the so-called Violas has been vastly improved, the constitutional vigour of *V. cornuta* is still there, and the plants resist winter's cold and summer's heat better than the Show or Fancy varieties of Pansies.

Another species used was *Viola lutea* (Yellow Mountain Violet). The flowers are bright yellow, and the plant is found on the higher mountain pastures of Britain. This plant never resisted the drought so well as the Horned Violet (*V. cornuta*), but it was used a good deal for bedding-out, and is probably the parent of the yellow forms of the Tufted Pansy.

FIG. 763. RAYED VIOLA.

The culture of Violas and Pansies does not differ materially, except that better results are obtained with the Viola, and with considerably less trouble. This does not imply that it is not desirable to take pains with the culture of this charming, hardy, border flower. In good, deep garden loam, well-enriched with decayed manure, the Viola will give a vigorous and sustained display of its beautiful blossoms from early spring until the fall of the leaf in autumn, when frosty nights check the growth of the plants. Of course, during the period between early spring and late autumn, the plants require the careful hand of the gardener to keep up a good display of blossoms. There is nothing to do during the early months of the year, except to keep the plants free from weeds, and stir up the surface of the soil occasionally, as it is apt to become caked by rains, and therefore not in a condition to promote a vigorous growth. The Viola, as well as the Pansy, must be kept moist at the roots. Few plants have such an immense mass of rootlets, spreading in all directions, and if dry weather sets in they soon extract the moisture from the surrounding soil. It is therefore very desirable, as soon as hot, dry weather sets in, to place a thin layer of decayed manure all over the surface of the beds, and to water freely. A good soaking is necessary, so that the water will go down to the rootlets. It will carry the fertilising properties of the manure with it, and will aid greatly in keeping up the blossom in fulness and quality all through the season; but it is not well to allow the plants to become overcrowded with growth and blossom. If, as sometimes

Viola—*continued.*

happens, a brilliant display of blossom is wanted on a particular date—and this applies to Pansies as well as to Violas—we advise picking off the blossoms about two weeks before the date, giving a surface-dressing, and pegging the shoots down into it. Even if the plants have become exhausted by a long period of plentiful blossom, they will start again if well supplied with water (if needed) like giants refreshed, and the blossoms will be abundant and of good quality.

There are now two sections of Violas. The early type had rays of colour, striking out from the centre of the blossom (Fig. 763), but after a time seedlings were obtained of better form, and without rays, or, at least, the rays were inconspicuous; and from the point of view of the florist the rayless varieties were the best, and this type of flower has been greatly improved in recent years.

Planting should be done in the autumn, in order to get a good display in spring, and they should be strong, well-established plants. Propagation should take place in July and August, in the same manner as advised for Pansies. Plant out permanently in September or October the same distance, viz., a foot between the plants. It will also be well to plant out a bed or border of Violas in the spring. Seedlings may be treated in the same manner as named varieties. The Viola is still one of the best plants for bedding-out purposes, and lines or masses of colour, according to the taste of the owner, may be planted, and the effect is very good indeed.

To the species described on pp. 181-3, Vol. IV., the following should be added:

V. aurea (golden). The correct name of *V. præmorsa.*

V. Beckiana (Beck's). This is described as "a handsome rock plant with large blue or yellow flowers." Bosnia, 1896.

V. calcarata flava (yellow). A yellow-flowered form. SYN. *V. Zoysii.*

V. cenisia. Mont Cenis Violet. *fl.* violet, with a very slender, arched spur; sepals lanceolate, elongated. June. *l.* ovate-elliptic or ovate-lanceolate, entire, hispid; stipules entire or palmately cleft. *h.* 6in. Alps, 1759.

V. cornuta alba (white). *fl.* pure white, large, elegant.

V. declinata (declinate). *fl.* of a deep, bright purple, large, with darker markings near the yellow eye; sepals elongated. May and June. *l.* ovate, bluntly-toothed, scarcely appendiculate. *h.* 6in. Transylvania, 1892.

V. gracilis (slender). *fl.* deep purple, large; spur somewhat curved, about as long as the corolla. Spring. *l.*, first ones oblong, narrowed at base, obsoletely crenate; the rest linear-lanceolate, acute. *h.* 3in. Orient, 1817. (S. F. G. iii., t. 222.)

V. lactea is now regarded as a species.

V. lutea (yellow), of Hudson. A form of *V. tricolor.*

V. lutea (of Lamarck). A synonym of *V. biflora.*

V. maculata (spotted). The correct name of *P. pyrolæfolia.*

V. mirabilis (remarkable). *fl.* pale blue, scented, the earlier ones large and sterile, the later ones apetalous and fertile; petals entire; spur cylindrical. April and May. *l.* reniform-cordate, acuminate, long-petiolate; cauline ones almost sessile. Europe.

V. montana is a form of *V. canina.*

V. odorata semperflorens (ever-flowering). *fl.* rather larger and more odorous than in the type. Spring and autumn.

V. o. sulfurea (sulphur-coloured). *fl.* pale yellow, with a little orange at the throat. *l.* more velvety than in the type. 1896. SYN. *V. Vilmoriniana.*

V. palmata is now regarded as a species.

V. pinnata (pinnate). *fl.* violet; sepals ovate; peduncles radical. June and July. *l.* palmatipartite, with twice- or thrice-toothed segments. *h.* 6in. Alps, 1752.

V. Reichenbachiana (Reichenbach's). A form of *V. sylvestris.*

V. reniformis (kidney-shaped). *fl.* blue and white, very beautiful; peduncles about 2in. high. July. *l.* small, crowded, reniform. Stems numerous, slender, creeping. Australia, 1823. Allied to *V. hederacea*, but now regarded as distinct. Tender. SYN. *Erpetion reniforme* (S. B. F. G. ii., t. 170). There is a large-flowered form *grandiflora.*

V. suavis is a form of *V. odorata.*

V. sylvestris. The correct name of *V. sylvatica.*

V. Vilmoriniana (Vilmorin's). A synonym of *V. odorata sulfurea.*

V. Zoysii (Zoys'). A synonym of *V. calcarata flava.*

Viola—*continued.*

VARIETIES OF TUFTED PANSIES OR VIOLAS. The following are all good varieties of these popular plants:

ABBESS, blue, on a grey ground, bright yellow eye; A. J. ROWBERRY, golden-yellow, rayless; AMY BARR, pink, veined white; ARCHIE GRANT, deep blue, excellent for bedding or for exhibition; BORDER WITCH, shaded pale blue, self, rayless; BUTTERFLY, white, edged rose, large; CALLIOPE, deep yellow, self; COUNTESS OF KINTORE, deep bluish-purple, edged with white; CRAIGIE, purplish-crimson and lavender, fine variety; CROWN JEWEL, purple-blue on a white ground; DOVE, creamy-white, dotted with heliotrope, rayless; ENDYMION, lemon-yellow; GEORGE LORD, deep primrose, rayless; GOLDEN BEAUTY, deep yellow, bordered white, rayless; HAMLET, upper petals sepia, flaked purple, shaded with dark brown, lower ones orange, shaded dark brown and bronze; H. W. STUART, dark purple, shaded crimson, excellent variety; JAMES C.

FIG. 764. VIOLET PRINCESS BEATRICE.

ERSKINE, fawn, shaded crimson and purple, yellow and gold; LORD MALCOLM, purple self, very handsome; LUCELLIA GOLD, pure white, edged light blue; MELAMPUS, deep yellow, rayless; PEMBROKE, yellow self, rayless; SULTAN, smoky-heliotrope; SYDNEY, bright yellow, rayless; ULIDIA, white, spotted bluish-mauve, rayed; WHITE DUCHESS, white, edged with blue; WINSOME, white, with blue rays, and bordered with pinkish-blue.

VARIETIES OF SWEET VIOLET. The following are noteworthy additions to those described on p. 180, Vol. IV.:

Single: ADMIRAL AVELLAN, reddish-purple, very sweet; CALIFORNIA, violet-purple, large, good for forcing; DEVONIENSIS, deep blue, very profuse; LA FRANCE, blue-violet, very large flowers, fragrant, very fine variety; ODORATISSIMA, blue-violet, very fragrant; PRINCESS BEATRICE, bright bluish-purple, vigorous

Viola—*continued.*

(Fig. 764, for which we are indebted to Messrs. Cutbush and Sons); PRINCESS OF WALES, bright blue, on long stalks, very sweet-scented, the sweetest of all Singles; RAWSON'S WHITE, white, tinged with pink; SULPHUREA, khaki-colour; WELLSIANA, deep purple, large, on long stems, fragrant. *Double*: BELLE DE CHATENAY, white, large, and fragrant; COOL CRONAN, clear blue, very fragrant, and of great size; DE PARME, pale lavender-purple, good for forcing; KING OF VIOLETS, dark blue, large, best for outdoor culture; LADY HUME CAMPBELL, rich blue, late; MDLLE. BERTHA BARRON, indigo-blue, very fragrant and free; MRS. J. J. ASTOR, soft rosy-heliotrope; PARMAENSIS, white, striped rose-pink; SWANLEY WHITE, this is identical with COMTE DE BRAZZA.

VIRGILIA INTRUSA. A synonym of **Calpurnia intrusa** (which *see*).

VITEX. *V. laciniata* is synonymous with *V. Negundo incisa*. *V. arborea* (of Desf.) is identical with *V. Negundo*.

VITIS. To the species and varieties described on pp. 186-8, Vol. IV., the following should be added. All are hardy, unless otherwise stated. *See also* **Ampelopsis** and **Cissus.**

V. acuminata (taper-pointed). *fr.* black, large, in long, narrow bunches. *l.* rounded or slightly cordate at base, gradually narrowed to a sharp point, scarcely toothed on the margin, glabrous above, with very short, glaucous-white pubescence beneath. Eastern Asia, 1890.

V. ægirophylla (revived-leaved). *fl.* small; peduncles opposite the leaves, often twin, longer than the leaves, dichotomously cymose. *fr.* ⅛in. long. *l.* pale, glabrous, broadly ovate, abruptly acuminate, unequally and deeply acuminate-toothed; lower ones 3in. long. Branches without tendrils, terete, striated. Turkestan, 1892.

V. amurensis (Amur). This is now classed as a species, and not as a form of *V. vinifera*.

V. apiifolia (Apium-leaved). A garden synonym of *V. vinifera laciniosa*.

V. argyrophylla. A misprint for *V. ægirophylla*.

V. Berlandieri (Berlandier's). *fr.* blackish-violet, globose-paniculate, maturing late; pulp very abundant. *l.* cordate, orbicular, more or less three-lobed, triangular-toothed, rigid, green above, very pale beneath, glabrous or pubescent. SYN. *V. monticola* (of Engelmann). Stems pentagonal, covered with a crisp, floccose pubescence. Texas and New Mexico, 1888.

V. californica (Californian).* *fr.* black, small, rather agreeably flavoured, disposed in thick bunches. *l.* small, rounded-cordate, lustrous green, with tufts of hairs on the nerves beneath, turning deep crimson in autumn. California. A very vigorous, hardy species.

V. candicans (whitish).* Mustang or Horse Grape. *fr.* large, in small, irregular bunches, with a very sharp flavour. *l.* cordate, entire or deeply lobed, obscurely toothed, glabrous above except for some silvery hairs on the nerves, the lower surface covered with compact white down. North America. A very vigorous and productive species—one of the best from a decorative point of view.

V. capensis (Cape). *fl.* tomentose, disposed in short cymes. *fr.* blackish-red, depressed-globose. *l.* reniform, obtuse-angled, and sinuate-toothed. South Africa, 1887. Greenhouse trailer. (R. H. 1887, p. 372.)

V. cinerea (greyish). *fr.* black, very small; peduncles very long, twisting with the tendrils. *l.* about 1ft. in diameter, glossy and swollen above. Branches with four or five well-marked angles. North America. There is a variety *canescens*, with much smaller leaves, and more ornamental than the type.

V. Coignetiæ (Mme. Coignet's).* *fl.* often polygamous. *fr.* round. *l.* (with the petioles) about 1ft. long, orbicular, about 1ft. across, with three strongly-toothed, mucronate lobes, the basilar sinus very variable, white-tomentose beneath, in autumn assuming a beautiful crimson or claret tint. Branches very long and strong; tendrils pink, yellow when young. Japan, 1884. Allied to *V. Labrusca*. (G. C. 1897, xxii., p. 305.) One of the best of ornamental Vines.

V. dissecta. *See* **Ampelopsis aconitifolia.**

V. Doaniana (Doan's). This is described as "a very hardy Vine, with hoary-white leaves and branches." Texas, 1896. (G. & F. 1896, p. 454, f. 59.)

V. flexuosa (bending). *fl.* disposed in an elongated panicle. *l.* cordate, toothed, villous on the lower surface. Stem flexuous. Japan, &c., 1841.

V. f. major (greater).* This is a very fine variety, having leaves often 7in. across, and trilobate; while the young shoots and tendrils are of a nice crimson. A beautiful climber, well worth attention on account of its autumn colours.

Vitis—*continued.*

V. heterophylla is the correct name of *V. Davidiana*. There is a variegated form of *V. heterophylla humulifolia*.

V. inconstans (inconstant). The correct name of *Ampelopsis tricuspidata*. SYN. *V. japonica* (of gardens).

V. indivisa (undivided). *fl.* five-petaled. *fr.* a little larger than Peppercorns; panicles twice or thrice bifid, without tendrils. *l.* simple, somewhat three-lobed, 3in. to 5in. broad, cordate or truncate at base, coarsely glandular-serrated, pubescent on the nerves beneath. Stem long, climbing. Eastern North America, 1888. SYN. *Ampelopsis cordata*.

V. japonica crassifolia (thick-leaved). *l.* large, very thick, coriaceous, three-lobed, bright green above, cobwebby-tomentose beneath. 1886.

V. japonica (of gardens). A synonym of *V. inconstans*.

V. monticola (mountain-loving). *fr.* white and amber-yellow, agreeably flavoured; bunches strong, branched. *l.* cordate, with a deep basal sinus. North Texas. This is really a variety of *V. æstivalis*.

V. monticola (of Engelmann). A synonym of *V. Berlandieri*.

V. multifida gracilis (much-cleft, slender). *fr.* black, in small bunches. *l.* deeply lobed. Stems very slender. China, 1891. Plant much-branched.

V. obtusifolia (obtuse-leaved). *l.* cordate, nearly entire, covered with a white tomentum. 1891. (R. H. 1891, p. 522, f. 136.) The variety *serotina* is apparently only a form of the female plant, which ripens its fruit late. 1891. (R. H. 1891, p. 520, f. 134.)

V. odoratissima (very sweet). A synonym of *V. riparia*.

V. orientalis (Oriental). *fl.*, peduncles axillary, shorter than the leaves, dichotomously and divaricately cymose. *fr.* depressed, four-seeded. *l.* triangular, bipinnate; uppermost ones sometimes trifoliolate; leaflets stalked, glaucous beneath, rounded or cuneate at base, ovate-oblong, deeply and acutely incised. Branches five- or six-angled, without tendrils. Orient.

V. pseudospina (false spine). A synonym of *V. Romaneti*.

V. reniformis violacea (kidney-shaped, violet). *fl.* dioecious; males in small panicles, on slender, dark red peduncles. *l.* large, roundish-reniform, obtuse, crenulate, dark green above, paler beneath, strongly reticulated, the veins (and petioles) cottony-hairy. Stems very long, slender. China, 1888. (R. H. 1888, p. 536, f. 132.)

V. riparia is now regarded as a distinct species and not as a variety of *V. cordifolia*. (B. M. 2429.)

V. Romaneti (Romanet's). *fl.* small, monœcious or polygamous; males in freely-produced, compact panicles. *fr.* black, disposed in narrow bunches. *l.* very variable, cordate to five-lobed, acute, toothed, bright green above, silvery-white beneath. 1888. Hardy. SYNS. *V. pseudospina*, *Ampelovitis Romaneti*.

V. R. obtusifolia (obtuse-leaved). *l.* cordate, nearly entire, covered with white tomentum. 1891. The so-called variety *serotina* appears to be merely the female plant, which ripens its fruit late. (R. H. 1891, pp. 520-22. f. 134-6.) There is also a variegated form named MME. CAPLAT.

V. rotundifolia (round-leaved). A synonym of *V. rulpina*.

V. rupestris (rock-loving). *fl.* polygamous; racemes opposite, and longer than, the leaves, decompound, pyramidal-oblong. *fr.* bluish-black, small. *l.* somewhat reniform-cordate, five-nerved, reticulate-veined, glabrous, unequally and deeply crenate-serrated, the teeth mucronate, the base somewhat truncate and entire. Stem striated, tuberculate; branchlets purplish. Rocky Mountains.

V. rutilans (reddish).* *fl.* dioecious, in rather strong racemes, very red when developed. *l.* broadly cordate, 10in. long, acute, serrated, velvety-tomentose, especially beneath. Stems and petioles densely clothed with dark red bristles. Eastern Asia, 1890. A very distinct species. (R. H. 1890, p. 444.)

V. sempervirens (evergreen). A synonym of *V. striata*.

V. Sieboldii (Siebold's). A synonym of *V. Thunbergii*.

V. Thunbergii is now accorded specific rank. *fl.* umbellate, many in a divaricate, tomentose panicle. *fr.* black, globose, as large as small Peas. *l.* larger than in *V. Coignetiæ* and very beautiful, cordate at base, three- or five-lobed, pubescent or glabrous above, fuscous-tomentose beneath; lobes varying from undivided to pinnatifid, remotely serrated. Japan. (R. G. 424.) SYN. *V. Sieboldii*.

V. vinifera laciniosa (torn). *l.* divided into five segments, which are petiolulate and much cleft. *h.* 20ft. 1648. SYN. *V. apiifolia* (of gardens).

V. Voinieriana (Voinier's). *fr.* large, of a peculiar flavour. *l.* consisting of three pedicellate leaflets on a common petiole; they are oblong-obovate, 4in. long, 5in. broad, serrated, prominently nerved, glossy green above, hairy beneath. Stems thick, fleshy, climbing. China, 1897. Stove. It is not certain that this plant is a Vitis.

FIG. 765. WATSONIA MERIANA IRIDIFOLIA ARDERNEI.

VITMANIA. A synonym of **Oxybaphus** (which *see*).

VITTADINIA (from *vitta*, a ribbon, and *aden*, a gland). SYNS. *Eurybiopsis*, *Microgyne*. ORD. *Compositæ*. A small genus of greenhouse or hardy, perennial herbs or under-shrubs, natives of South America, Australia, New Zealand, &c., and closely allied to *Erigeron*. *V. triloba* (of gardens) is synonymous with *Erigeron mucronatus*.

VITTARIA. Ribbon Fern. Vittarias succeed well in sandy peat and under the influence of a moist, stove temperature. Their propagation is usually effected by division of the crowns.

To the species described on p. 188, Vol. IV., the following should be added:

V. stipitata (stalked). *fronds* 1½ft. to 2ft. long, ¼in. to ½in. broad, firm, gradually tapering below into a long, slender stem; midrib indistinct except towards the base; veins distant, oblique. *sori* sunk in a groove within the margin, with the flattened, thickened edge of the frond produced beyond it. Colombia to Peru. SYN. *Tæniopsis stipitata*.

VIVIPAROUS. Producing spores, seeds, or bulbs, which generate while attached to the parent-plant.

VOCHISIA [the proper spelling]. *V. ferruginea* is the correct name of *V. tomentosa*.

VOUAPA. The correct name of *V. bifolia* is *Macrolobium Vuapa*.

WACHENDORFIA. *W. brevifolia* is a form of *W. hirsuta*.

WAHLENBERGIA. To the species described on p. 190, Vol. IV., the following should be added:

W. dalmatica is now regarded as a distinct species. *fl.* violet-blue; corolla funnel-shaped, semi-five-cleft; head terminal, six- to ten-flowered. Summer. *l.* linear-lanceolate, entire, acute, clasping at base, 1in. to 2in. long; radical ones clustered in a rosette. Stems ascending or erect, about 3in. long. Dalmatia. Hardy perennial.

W. graminifolia (Grass-leaved). *fl.* purple, large, three to six in a terminal cluster; corolla infundibular-campanulate. May to July. *l.* entire, softly pubescent (as well as the stems); radical ones rosulate, linear or linear-spathulate, ¼in. to 1½in. long; cauline ones few, erect, 1in. or more in length. *h.* 3in. South Europe. Hardy perennial; ripens seed freely.

W. nivea (snowy). *fl.* having the calyx reddish and the corolla snow-white; bracts (and stem) purple. *l.* Grass-like. Alps of Bosnia, 1893. SYN. *Hedræanthus* (*Edraianthus*) *niveus*.

W. Pumilio (dwarf). *fl.* bluish or reddish-lilac, campanulate, numerous, solitary, sessile. May and June. *l.* bluish, spreading, very narrow, ½in. or more in length, acuminate, entire, highly glabrous. Stem very short and very leafy. Dalmatia. Hardy perennial.

W. pumilorum (*W. Pumilio*-like). This resembles *W. Pumilio*, but is more straggling, and has a longer tube to the corolla and smaller leaves. It does well on the rockery.

W. serpyllifolia (Thyme-leaved). The Kew Hand-list keeps up this name, and regards *Campanula serpyllifolia* as a synonym, but the "Index Kewensis" gives the latter as the correct name.

W. undulata (wavy). *fl.* violet-blue, terminal, ½in. to 1in. in diameter; corolla five-cleft, the lobes acute; peduncles usually few-flowered. *l.* sessile or somewhat clasping, spreading, about 1in. long, ovate-oblong or -lanceolate, crenate or toothed, sinuated, and undulated. Stem ascending or weak, 6in. to 12in. high. South Africa, 1891. A rigid, half-hardy annual. (B. M. 7174.)

WAITZIA. *W. odontolepis* is the correct name of *W.* (*Morna*) *nivea*.

WALCKENÆRA. *See* **Spiders.**

WALDSTEINIA. *W. sibirica* is the correct name of *W. trifolia*.

WALKERA. Included under **Gomphia** (which *see*).

WALL. *See* **Walls.**

WALLICHIA. *W. disticha* is grown in botanic gardens. One or two species formerly included hereunder are now referred to **Didymosperma**.

WALUEWA (named in honour of Count P. A. Walujew [Valnev]). ORD. *Orchideæ*. A monotypic genus. The species is a small, tufted, stove Orchid, allied to *Gomeza*. It requires the same treatment as the Brazilian species of **Miltonia** (which *see*).

W. pulchella (rather pretty). *fl.* yellowish, about ½in. long, with a purple band on the petals and purple spots on the lip; racemes basal, six- to eight-flowered, recurved. February. *l.* solitary, lanceolate, acute, 2½in. long. Pseudo-bulbs compressed, oblong or almost linear, 2in. to 2½in. long. Brazil, 1890. (R. G., t. 1341, f. 1.)

WARREA. To the species described on p. 196, Vol. IV., the following should be added:

W. bidentata (two-toothed). *fl.*, lip longer and narrower than in *W. tricolor* and not so transverse, the keel at the base very sharp, the disk covered with seriate callosities. (P. F. G. i., p. 73, f. 47.)

W. cyanea (blue). A synonym of *Aganisia cyanea*.

WASHINGTONIA. *W. robusta* is now regarded as synonymous with *W. filifera*. *W. Sonoræ* is grown at Kew.

WATER ELM. *See* **Zelkova.**

WATER ERMINE MOTH. *See* **Spilosoma Menthastri.**

WATER LILY, NEW ZEALAND. *See* **Ranunculus Lyallii.**

WATER LOCUST-TREE. *See* **Gleditschia monosperma.**

WATER PLANTS. *See* **Aquatic Plants.**

WATER REED. *See* **Arundo.**

WATERING ENGINES AND PUMPS. These are essential in most gardens, not only to economise labour, but for applying water in the best form to trees, plants, lawns, borders, &c. For general use on lawns and borders where water is laid on, the apparatus known as the Lawn Sprinkler is excellent, as it can be attached to the hose, and easily moved about from one part to another, the water being ejected from a stand-pipe in a fine shower in the shape of an umbrella. Perforated pipes can scarcely be termed engines, yet are very useful for watering purposes where there is a good force of water laid on. *See also* **Spraying Machines.**

WATERING-POT, HIGH LEVEL. Probably the most useful of all Watering-pots are those known as "Haw's Patent." These are made in various sizes and of good material, with long spouts on which a fine rose can be fixed, from which the water ascends and then falls gently on the seeds or newly-potted or pricked-out plants. The handle is placed from the back to the top of the pot, and is very convenient for use. This Watering-pot is deservedly popular amongst gardeners and nurserymen.

WATSONIA. J. G. Baker's latest classification ("Handbook of *Irideæ*") places the number of species at fifteen. To the species, &c., described on pp. 201-2, Vol. IV., the following should be added. *See also* **Anthericum, Antholyza, Gladiolus,** and **Micranthus.**

W. Meriana coccinea is now accorded specific rank as *W. coccinea*.

W. M. iridifolia Ardernei (Ardern's).* *fl.* pure white, rather large. 1889. A charming variety, also known as *O'Brieni*. See Fig. 765, for which we are indebted to Messrs. Sander and Sons.

WEBERA. According to the "Index Kewensis," *Tarenna* is the correct name of this genus.

WEEPING. Having pendulous branches or branchlets.

WEEPING TREES. *See* **Trees and Shrubs.**

WEEVILS. The destructive propensities of the chief offenders falling under the above heading were noted under **Otiorrhynchus,** in Vol. II., and other specific headings. Many of them are destructive alike as larvæ and as perfect insects, especially the Black Vine Weevil (*O. sulcatus*, Fig. 766), and the Clay-Coloured Weevil

Weevils—*continued.*

(*O. picipes*, Fig. 767). These are practically omnivorous so far as garden produce is concerned, but are especially destructive to Vines, Strawberries, Raspberries, Gooseberries, Apples, Plums, Peaches, Ferns, and many flowering plants. All are night-feeders, and should

FIG. 766. BLACK VINE WEEVIL.

be sought for by artificial light. They are easily alarmed, and if a light be suddenly turned upon them, or a slight tap be given to the infested trees, the insects will drop. If, therefore, some sticky compound be arranged upon boards or papers, and laid beneath the plants, the pests may be prevented from escaping, and afterwards thrown into boiling water.

FIG. 767. CLAY-COLOURED WEEVIL.

WELDENIA (a commemorative name). SYN. *Lampra.* ORD. *Commelinaceæ.* A monotypic genus. The species is a decorative, cool greenhouse, tuberous-rooted herb, very closely allied botanically to *Zebrina.*

W. candida (white). *fl.* snow-white, 1in. in diameter, solitary on erect scapes which are disposed in a cluster in the centre of the leaves; corolla lobes broad, spreading. April. *l.* six to eight, strap-shaped, 2in. to 6in. long, with folding bases. Stem short, simple. Mexico and Guatemala, before 1894. (B. M. 7405.)

WELSH ONION (*Allium fistulosum*). *See* **Onion,** Vol. V.

WERNERIA. The correct name of *W. frigida* is *W. rigida.*

WESTERIA. A corruption of **Wistaria** (which *see*).

WEYMOUTH PINE RUST. *See* **Bladder Rust.**

WHITE CAMASSIA. *See* **Camassia esculenta Leichtlini.**

WHITE FLY. *See* **Scale Insects.**

WHITE GUM. *See* **Eucalyptus leucoxylon** and **E. viminalis.**

WHITE-LINE DART MOTH. *See* **Vine Moths.**

WHITE-TAILED MEALY BUG. *See* **Scale Insects.**

WHITE TRUFFLE. *See* **Truffles.**

WHITE VINE. *See* **Clematis Vitalba.**

WHITE WATER-LILY. *See* **Nymphæa alba.**

WHITEHEADIA. *W. latifolia* is the correct name of *W. bifolia.*

WHITFIELDIA. Nine species, endemic in tropical Africa, are now referred to this genus.

WHITLOW GRASS. *See also* **Erophila.**

WIBORGIA. According to the "Index Kewensis," this is the correct name of *Viborgia.*

WIDDRINGTONIA. To the species described on p. 208, Vol. IV., the following should be added:

W. Whytei (Whyte's). *l.* Juniper-like, glaucous, linear, 1in. long. *cones* "somewhat smaller than a Chestnut," longer than broad. Stem sometimes 6ft. in diameter at base (in its native place). *h.* 140ft. Mount Milanji, Nyassaland, 1895. This tree, which is at present only known in a young state in our greenhouses, may perhaps prove hardy in South Cornwall.

WIGANDIA. *W. macrophylla* is now regarded as a form of *W. urens.*

WIKSTRŒMIA (named after J. E. Wikström, 1780-1856, a Swedish botanist). ORD. *Thymelæaceæ.* A genus comprising about twenty species of stove or greenhouse shrubs or trees, natives of tropical and Eastern Asia, Australia, and the Pacific Islands. Flowers shortly racemose or spicate at the tips of the branches; perianth having an elongated tube and four spreading lobes; stamens eight, included or shortly exserted. Leaves opposite or rarely alternate. *W. Alberti* is a greenhouse, deciduous, much-branched shrub, requiring similar culture to **Thymelæa** (which *see*). *W. viridiflora*—the bark of which yields a valuable paper material—is also in cultivation in botanical gardens. None of the species, however, are of any horticultural value.

WIKSTRŒMIA (of Schrader). A synonym of **Laplacea** (which *see*).

WILD. Native; growing spontaneously.

WILD SPANIARD. *See* **Aciphylla.**

WILDING. Broadly, this is any wild or uncultivated plant, though the name is often restrictively applied to the Crab-apple only.

WILLOW-LEAF BEETLE. *See* **Phratora Vitellinæ.**

WINDOW-BEARING ORCHID. *See* **Cryptophoranthus.**

WINTER HAWTHORN. *See* **Aponogeton distachyon.**

WINTER MOTHS. In the olden days grease-banding was almost entirely relied upon for keeping these pests in check. The remedy now is Paris Green, so long as it is not applied while the trees are in blossom. 1oz. to 24 gallons of water will suffice, if the mixture is *kept stirred.*

WISTARIA. To cultivate *W. chinensis* successfully it should be allowed plenty of head room, a fairly rich soil, and a sunny position. *W. multijuga* is not so well known, and, though shy in a young state, is nevertheless well worth growing. To the species and varieties described on pp. 213-4, Vol. IV., the following should be added:

W. chinensis alba (white). *fl.* white, very sweet-scented; racemes smaller than in the type (Fig. 768). The plant is also rather less vigorous and not so floriferous.

W. floribunda (abundant-flowered). A synonym of *W. chinensis.*

W. frutescens. The following are varieties: *alba* (SYN. *nivea*), flowers white; *Backhousiana*, violet, in long, compact racemes; *magnifica*, clear blue, with a greenish-yellow spot on the standard, leaves very velvety; *purpurea*, purple-violet.

W. japonica. This name is kept up in the Kew Hand-list, but according to Asa Gray and the "Index Kewensis," the correct name is *Milletia japonica.*

W. multijuga. According to the "Botanical Magazine" (7522), this is a form of *W. chinensis.* The variety *alba* has flowers wholly white.

WISTERIA. A corruption of **Wistaria** (which *see*).

WITCH or WYCH ELM. *See also* **Ulmus glabra.**

WITCHES' BROOMS. *See* **Witches' Knots**, Vol. IV.

WITSENIA. *W. corymbosa* is now classed under *Aristea*, and the only species of this genus is described herennder:

W. maura (Moorish). *fl.*, perianth tube 2in. long, ¼in. in diameter at the throat, brownish towards the base, bluish-black towards the top, the segments ½in. long, erect; clusters crowded in oblong heads. December. *l.* distichous, rigid, ensiform, ½in. long. Stem woody, erect, 2ft. to 4ft. long; branches leafy to the top. Cape Colony, 1790. (B. R. 5; F. d. S. 72; P. M. B. viii., p. 221.)

W. partita (parted). A synonym of *Klattia partita*.

WITTSTEINIA (a commemorative name). ORD. *Ericaceæ*. A monotypic genus. The species is a greenhouse, prostrate or creeping shrub—one of the few Australian plants of the order. It is closely allied to *Themistoclesia*. For culture, *see* **Erica**.

W. vacciniacea (Vaccinium-like). *fl.* yellowish-greeen or reddish, about ½in. long, pendulous, solitary in the axils. *l.* scattered or in clusters of two or three, obovate-oblong, obtuse, thick, about 1in. long, shortly petiolate, pale or glaucous beneath. Branches ascending, 6in. to 12in. long, usually slightly pubescent. Victoria, 1892

FIG. 768. WISTARIA CHINENSIS.

WOLKENSTEINIA THEOPHRASTA. A synonym of **Gomphia Theophrasta** (which *see*).

WOODLICE. These very common crustaceans are a source of much trouble to growers for market and others. The pests are particularly destructive in plant-houses containing forced vegetables and flowers, the former more particularly. Outside they are more easily dealt with, and therefore they do not constitute such pests

Woodlice—*continued.*

as they are inside. Young Tomato plants, Mushrooms, Melons, Cucumbers, Mint, and many other subjects are laid under contribution, and the Woodlice, being night-feeders, are somewhat difficult to deal with. In the daytime, as stated under **Oniscidæ** (Vol. II.), they lie concealed under anything affording the slightest shelter. Traps of various kinds may be employed, the most effective—at any rate in Mushroom houses—being small flower-pots, half-filled with moss and laid upon their sides. The pests take shelter in these after their midnight revels, and may be shaken therefrom over a vessel of boiling water in the morning. Still more effective, however, is phosphorus paste as used for Cockroaches. This should be spread upon bread-and-butter, and laid about their haunts. Barley-meal and paste in equal parts laid upon pieces of wood is also good.

WOODSIA. Most of the known Woodsias are found in cold and temperate climates. North America is particularly rich in them, and the genus is well represented in Great Britain by two species, *W. hyperborea* and *W. ilvensis*, both of which are of particularly distinct character, and rank among the rarest of our native Ferns. As a rule, Woodsias may be said to flourish where but little soil is allowed around their roots, in crevices of damp rocks, or upon the rocks themselves, generally in fairly exposed situations. They are well adapted for growing in small intermediate and hardy Ferneries, where they form suitable companions to *Asplenium Ruta-muraria*, *A. Ceterach* (or *Ceterach officinarum*, as it is more commonly called), *A. Trichomanes*, &c., and they may also be successfully cultivated in pots. They require a very open soil, composed of turfy peat and light loam in equal parts, with a free admixture of finely-broken charcoal, sandstone, or silver-sand. Thorough drainage is essential, and the crowns of the plants should be kept above the soil and surrounded by a few small stones: the effect of this arrangement is to keep the roots in a permanently moist state without using much water, as they are particularly averse to stagnant moisture.

Woodsias are usually increased by the division of their crowns, an operation which is attended with most satisfactory results when performed during their resting period—from November to March. They may also be propagated by means of their spores, which are produced in abundance and germinate freely, especially when sown in a temperature of 65deg. to 70deg.

WOODWARDIA. Chain Ferns. Woodwardias possess a decorative character for either the cool greenhouse, the conservatory, or the hardy Fernery, according to their requirements. Few Ferns are as effective as *W. radicans* or *W. orientalis*, grown either on the rockery or in a hanging-basket in the conservatory; while *W. areolata* (or, as it is usually called in gardens, *W. angustifolia*) and *W. virginica* are very ornamental when planted in a marshy part of the hardy Fernery. The compost in which Woodwardias thrive most luxuriantly is a mixture of equal parts fibrous loam, peat or leaf-mould, chopped sphagnum, and silver-sand, with abundance of water at the roots all the year round. It is of the utmost importance that these plants should be strictly kept under cool treatment, as when subjected to heat they soon become a prey to Thrips and Scale, whereas when grown in a cool atmosphere they are usually very clean.

Although Woodwardias may be, and sometimes are, propagated from spores, they are usually increased by means of the young bulbils produced either towards the end of their fronds, as in *W. radicans* and its varieties, or over the whole of their surface, as in *W. orientalis*. The hardy kinds are also easily multiplied by the division of their rhizomes—an operation which is more successfully performed from November to March than at any other time of the year.

To the species, &c., described on pp. 217-8, Vol. IV., the following should be added:

W. radicans Burgesiana (Burges').* *fronds* light and elegant, sometimes 2½ft. long, of a harsh, coriaceous texture; pinnæ and pinnules uniformly depauperated, serrated throughout. Azores.

W. r. Brownii (Brown's). The correct name of *W. r. cristata.*

WOOLLY BEAR. *See* **Tiger Moths.**

WORKING. A term applied to plants grafted or budded on stocks. The great majority of grafted or budded plants are worked as low down as possible, to prevent suckers or growths from springing up and thus injuring or choking the scion. Occasionally Apple- and Pear-trees are worked 6ft. from the soil to form standards, but this is seldom practised now, the major portion of standard trees being worked low down like other trees.

WULFFIA. *W. stenoglossa* is the correct name of *W.* (*Gymnolomia*) *maculata.*

WURMBEA. According to Baker ("Flora Capensis"), *W. capensis* is the correct name of *W. campanulata.*

XANTHISMA. *X. Drummondii* is synonymous with *X. texanum.*

XANTHOCEPHALUM. *X. gymnospermoides*, described on p. 221, Vol. IV., is a hardy annual, and is therefore propagated by seeds.

XANTHORHIZA. According to the "Index Kewensis," *Zanthorhiza* is the correct rendering.

XANTHOSOMA. To the species described on pp. 223-4, Vol. IV., the following variety should be added:

X. helleborifolium. The correct name is *Andromycia cubensis.*

X. Lindeni magnificum (magnificent).* A handsome variety, having much larger leaves than in the type. 1885. SYN. *Phyllotænium Lindeni magnificum.*

XAVERIA. A synonym of **Anemonopsis** (which *see*).

XERANTHEMUM. SYN. *Xeroloma.* These Everlastings are now to be obtained in mixed varieties—white, purple, pink—which are far superior to the type. They may be sown in either spring or autumn.

XEROLOMA. A synonym of **Xeranthemum** (which *see*).

XEROPHYLLUM. *X. setifolium* is the correct name of *X. asphodeloides.*

XIPHIDIUM. *X. cæruleum* is the correct name of *X. floribundum.*

XYLEBORUS DISPAR. *See* **Apple-Bark Beetle.**

XYLEBORUS DRYOGRAPHUS. *See* **Oak—Insect Pests.**

XYLEBORUS PERFORANS. *See* **Dendrobium Beetle.**

XYLOBIUM. To the species described on p. 225, Vol. IV., the following should be added:

X. Colleyi (Colley's). *fl.* reddish-brown, spotted with purple, borne on short scapes, and having an odour resembling that of a Cucumber. *l.* large, Stanhopea-like. Pseudo-bulbs round. Trinidad, 1890. SYN. *Maxillaria Colleyi.*

X. leontoglossum (lion's-tongue). *fl.* yellow, dotted with red; sepals oblong-lanceolate; lip oblong, the lateral lobes narrow, the terminal one rounded, fleshy; raceme dense, oblong or cylindrical, nodding; scape robust. March. *l.* petiolate, elliptic-lanceolate, acute, plicate. Pseudo-bulbs clustered, fusiform. Colombia. (B. M. 7085.) SYN. *Maxillaria leontoglossa.*

X. corrugatum and *X. scabrilinguis* have also been introduced, but they have little horticultural value.

XYNOPHYLLA. A synonym of **Exocarpus** (which *see*).

XYRIS. *X. altissima* is synonymous with **Bobartia spathacea** (which *see*).

YACCA-WOOD TREE. *See* **Podocarpus Purdieana.**

YELLOW ROOT. *See* **Hydrastis canadensis.**

YELLOW WATER-LILY. *See* **Nuphar luteum.**

YUCCA. To the species and varieties described on pp. 227-34, Vol. IV., the following should be added:

Y. brevifolia (short-leaved). *fl.* erect; perianth greenish-white, 1½in. to 2in. long, with lanceolate segments; pedicels very short; panicle dense; peduncle short. *l.* dense, very rigid, thick, 6in. (or in young plants sometimes 12in.) long,

Yucca—*continued.*

in. broad. Trunk 1ft. to 2ft. thick, sometimes much-branched. *h.* 15ft. to 30ft. South-eastern California.

Y. Carrierei (Carrière's). *fl.* greenish-white, becoming creamy, large, globular, drooping, forming a terminal panicle 3ft. in height. *l.* very numerous, dark olive-green, 20in. to 24in. long. 1895. A fine hybrid between *Y. lævigata* and *Y. angustifolia*. (R. H. 1895, f. 21-3.)

Y. elata (tall). *fl.* fragrant, in an ample, dense, rhomboid panicle; perianth white, 2in. long; racemes lax, the lower ones 6in. to 9in. long; peduncle 3ft. to 4ft. long. Summer. *l.* densely rosulate, stiffly erect or spreading, linear from a suddenly-dilated base, 1½ft. to 2ft. long, pale green, pungent, the margins filiferous. Trunk 3ft. to 12ft. high. United States, 1893. (B. M. 7650; G. & F. 1889, p. 568, f. 146.) There is a variety *albo-marginata*.

Y. Engelmanni (Engelmann's). A synonym of *Y. Whipplei*.

Y. Hanburyi (Hanbury's). *fl.* in a simple raceme 1½ft. long; perianth white, campanulate, 2in. long. *l.* forming a dense rosette, linear, rigid, green, with a pale brown edge and a few marginal filaments. Habitat not recorded, 1892. Plant stemless.

Y. Hystrix (spiny). A garden name for *Agave striata*.

FIG. 769. ZYGO-COLAX VEITCHII KROMERII.

ZAMIA. Including *Aulacophyllum*. To the species described on p. 236, Vol. IV., the following should be added. *See also* **Encephalartos** and **Macrozamia.**

Z. amplifolia is a form of *Z. Wallisii*.

Z. latifolia (broad-leaved). The correct name of *Z. prasina*.

Z. Noeffiana (Noeff's). *l.* large, having large leaflets furnished with marginal teeth. South America, 1896. Allied to *Z. Lindeni*.

Z. Pseudo-parasitica (false parasite). The correct name of *Z. Roezlii*.

ZANONIA. A synonym of **Campelia** (which *see*). *S. sarcophylla* is identical with **Alsomitra sarcophylla.**

ZANTHORHIZA. According to the "Index Kewensis," this is the correct name of *Xanthorhiza*.

ZANTHOXYLUM. *Z. fraxineum* and *Z. ramiflorum* are synonyms of *Z. americanum*.

ZEHNERIA SCABRA. A synonym of *Melothria punctata*. *See* under **Z. suavis.**

ZELKOVA (a commemorative name). Water Elm. SYN. *Abelicea*. ORD. *Urticaceæ*. A small genus (four species) of hardy, deciduous trees, closely allied to **Celtis**

Zelkova—*continued.*

(which *see* for culture); one is found in Crete, a second inhabits the Caspian-Caucasus region, and the others are Japanese. Flowers usually monœcious, sessile or very shortly pedicellate, produced early. Leaves alternate, sessile or very shortly petiolate, serrate or crenate, penniveined; stipules free, slender, narrow, caducous.

Z. acuminata (taper-pointed). *fl.*, males in short, clustered, axillary racemes; females solitary. April. *l.* shortly petiolate, 3in. to 4in. long, ovate-oblong or oblong, acuminate or cuspidate, deeply crenate-toothed, the teeth cuspidate or mucronate. Branches very numerous. Mountains of Japan, about 1872. A small tree. SYN. *Z. Kaki*, *Planera Kaki* (G. & F. 1888, pp. 22, 23).

Z. crenata (crenate). Siberian Elm. *fl.* greenish, in axillary fascicles, strongly scented. April. *l.* ovate-oblong, acuminate or acute, crenate-serrated (the serratures mucronulate, not cuspidate), sparsely puberulous beneath. *h.* 75ft. Caucasus, 1780. SYNS. *Planera carpinifolia* (W. D. B., t. 106), *P. crenata*, *P. Richardi*.

Z. japonica Verschaffelti (Japanese, Verschaffelt's). This is described as an elegant, small tree, with conspicuously-toothed leaves. 1892. SYN. *Ulmus Verschaffelti*.

Z. Kaki (native name). A synonym of *Z. acuminata*.

ZENOBIA. *Z. floribunda* is a synonym of **Pieris floribunda** (which *see*).

ZEPHYRANTHES. To the species, &c., described on pp. 239-40, Vol. IV., the following should be added:

Z. Ajax. This is said to be a garden hybrid between *Z. candicans* [? *candida*] and *Z. citrina*. 1899. Half-hardy. (R. G. 1899, t. 1469.)

Z. cærulea (blue). *fl.* pale blue or lilac; perianth 1in. long, tubeless, the segments obovate-unguiculate; peduncle 3in. to 4in. long. March. Bulb less than 1in. in diameter, the neck 1in. to 1½in. long. Uruguay, 1897. Greenhouse.

FIG. 770. ZYGOPETALUM LEHMANNI.

Zephyranthes—*continued.*

Z. lilacina (lilac). *fl.* pale red (not lilac); perianth funnel-shaped, 2½in. long, the tube above the ovary as long as the oblong, imbricated lobes; peduncle one-flowered, erect, 5in. to 6in. long. August. *l.* four, 5in. to 6in. long, ¼in. broad, linear, contemporary with the flowers. Mexico, before 1894. Allied to *Z. carinata* (of which it was formerly regarded as a variety). Half-hardy.

Z. Lindleyana (Lindley's). *fl.* bright red; perianth 1½in. to 2in. long, the tube greenish, ½in. to ¾in. long, the segments obovate-cuneate, ½in. broad; peduncle slender, 6in. to 12in. long. June. *l.* narrow-linear, contemporary with the flowers, 6in. to 9in. long. Bulb globose, ¾in. in diameter, with a short neck. Mountains of Mexico, 1865. Greenhouse.

Z. longipes (long-stalked). *fl.* pale red; perianth 3in. long, with lanceolate, spreading segments; stamens short; spathes

1in. long; pedicels 4in. long; peduncle 3in. long. *l.* linear. Montevideo, 1898. Greenhouse.

Z. pumila is a synonym of *Hippeastrum roseum* (now lost to cultivation).

Z. striata is a synonym of *Z. verecunda*.

Z. Taubertiana (Taubert's). *fl.*, perianth white, flushed with very pale rose, dark green at base on the outside, 3in. long. *l.* narrow-linear, half to two-thirds the length of the nearly erect scape. Brazil, 1896. Greenhouse. (R. G. 1896, t. 1427.)

Z. texana (Texan). *fl.* yellow inside, coppery-red outside; perianth 1in. long, with scarcely any tube, the segments ¼in. broad; peduncle very slender, 4in. to 8in. long. *l.* three or

Zephyranthes—*continued.*

four, narrow-linear, contemporary with the flowers. Bulb globose, ¾in. in diameter; tunics dark brown; neck 1in. to 1½in. long. Texas. Half-hardy. SYN. *Habranthus Andersoni texanus* (B. M. 3596).

Z. Treatiæ (Mrs. Treaty's).* *fl.* white, fragrant; perianth 3in. long, the tube 1in. long, the segments keeled with red, ½in. broad; peduncle 6in. to 12in. long, purple at base. April and May. *l.* six to eight, contemporary with the flowers, not shining, only ¼in. broad. Bulb ovoid, ¾in. in diameter. Florida, before 1880. Half-hardy.

Z. verecunda. This is now the correct name of *Z. sessilis*. SYN. *Z. striata*.

ZINGIBER. To the species described on p. 241, Vol. IV., the following should be added:

Z. capitatum elatum (capitate, tall). The correct name of *Z. elatum*.

Z. Cliffordiæ is synonymous with *Z. Cassumunar*.

Z. Darceyi (D'Arcey's).* *l.* lanceolate, 6in. to 8in. long, 2in. to 2½in. broad, bright shining green, with a broad, creamy-white margin and oblique stripes of the same colour. *h.* 2ft. to 3ft. Sydney Botanic Garden, 1890. Habit robust.

Z. chrysanthum, *Z. Griffithii*, *Z. roseum*, *Z. spectabile*, and *Z. Wightianum* are grown in botanic gardens.

FIG. 771. ZYGOPETALUM MACKAYI (see page 747).

ZINNIA. To the species and varieties described on p. 242, Vol. IV., the following should be added:

Z. hybrida is, according to the "Index Kewensis," a form of *Z. verticillata*.

Z. linearis (linear).* *fl.* bright golden-yellow, with a light orange margin, 1½in. to 2in. across, profusely produced.

Zinnia—*continued.*

Summer. *l.* dark, linear or linear-lanceolate. *h.* 1ft. Mexico. 1837. A neat, erect, dense bush. (G. C. 1837, ii., p. 597; R. G. 1887, p. 667, f. 171.)

Z. mexicana (Mexican). A synonym of *Z. Haageana.*

Z. multiflora and **Z. tenuiflora** are forms of *Z. pauciflora.*

ZIZIPHORA. *Z. dasyantha* is a form of *Z. clinopodioides.*

ZIZYPHUS. *Z. sativus* is the correct name of *Z. vulgaris.* *Z. Paliurus* is a synonym of *Paliurus Spina-Christi.*

ZORNIA. *Z. bracteata* is the correct name of *Z. tetraphylla.*

ZYGADENUS. Including *Amianthium.* According to Sereno Watson, *Z. elegans* is the correct name of *Z. glaucus.*

ZYGOBATEMANNIA MASTERSI. An interesting, bigeneric hybrid Orchid, produced from crossing *Batemannia Colleyi* with *Zygopetalum crinitum.* Alike as regards flowers and habit, the hybrid is intermediate between its parents.

ZYGO-COLAX. A bigeneric hybrid, and the first of its section upon which the compound names of the two genera indicating the parentage were fixed. The principal cultural condition is a warm, moist position in the intermediate-house. The potting compost should consist of two parts peat and one of sphagnum.

Z.-C. Veitchii Kromerii. Sepals and petals green, mottled with dark brown; lip white, lined and spotted with violet-blue. See Fig. 769.

Hybrids.

NAME.	PARENTAGE AND RAISER.
Amesiana	*Z. brachypetalum* and *C. jugosus* (Sander).
leopardinus	*Z. maxillare* and *C. jugosus* (Veitch).
Veitchii	*Z. crinitum* and *C. jugosus* (Veitch).
Veitchii Kromeriit	Nat. Hyb.

† This flowered among imported plants of *Z. crinitum.* With the exception of its having larger flowers it is identical with *Zygo-Colax Veitchii.*

ZYGOPETALUM. To the species described on pp. 245-8, Vol. IV., the following should be added:

Z. Ballii (Ball's). *fl.*, sepals light purple; petals mottled with white towards the apex; lip white, with some purple around the crest. Allied to *Z. rostratum.*

Z. brachypetalum stenopetalum (narrow-petaled). *fl.*, sepals and petals narrow, acute; lip violaceous, with a white margin, the basal crest having about five crenatures. Brazil, 1888. (R. G., t. 1277.)

Z. Burtii (Burt's). The correct name of *Batemannia Burtii.*

Z. citrinum is a synonym of *Z. xanthinum.*

Z. Crepauxi (Crepaux's). *fl.* showy, rather crowded; sepals and petals dark red, spotted and striped yellow; lip large, white, with violet lines on the margin, the nerves covered with short, violet-rose hairs. *l.* shortly stalked, elliptic-obovate. Pseudo-bulbs small, angular. Brazil, 1887. A robust, tufted, stove species.

Z. forcipatum (forceps-like). *fl.* whitish-ochre; lip very broad, fringed in front, having two brick-red areas on each side of the callus and a few purple spots on the front part. Tropical America, 1883. Allied to *Z. gramineum.*

Z. Gibeziæ. *fl.* solitary; sepals and petals white, unmarked, oblong-lanceolate, acute; lip white, veined with violet, large and broad, with the sides turned up, and having a thick crest at the base. *l.* cuneate-oblanceolate, acute. Habitat not recorded. Allied to *Z. cochleare.* (L. iv., t. 181.)

Z. graminifolium (Grass-leaved). *fl.* 2in. across; sepals and petals bronzy blackish-brown, with some green spots and markings, acute; lip violet-blue, streaked with white, broadly obovate or obcordate, emarginate, convex; scapes five- to seven-flowered. *l.* three to five, Grass-like, 8in. to 12in. long. Pseudo-bulbs as large as a Filbert. South Brazil. (L. viii., t. 339.)

Z. grandiflorum (large-flowered). The correct name of *Batemannia grandiflora.*

Z. hemixanthum (half-yellow). *fl.*, sepals and petals white; lip yellow, with a darker crest. Colombia, 1888. Allied to

Zygopetalum—*continued.*

Z. Lalindei, but distinct in colour, and with numerous tubercles and processes at the base of the crests of the keels. SYN. *Bollea hemixantha.*

Z. intermedium peruvianum (Peruvian). A small-flowered variety. Peru. (L. viii., t. 418.)

Z. Jorisianum (Joris's). *fl.*, sepals and petals green, blotched with brown; lip having the front lobe pure white and the side lobes yellow; crest purplish-brown, large. Venezuela, 1890. In habit this species somewhat resembles *Z. crinitum* (L. v., t. 237.)

Z. Klabochii (Klaboch's). According to some authorities this is supposed to be distinct from *Z. Klabochorum.*

Z. Klabochorum excellens (excellent). *fl.* rather larger and stouter than in the type. 1894.

Z. laminatum (laminate). A small-flowered species, having sepals and petals light yellow, lip white, and rather narrow leaves. Habitat not recorded. 1885.

Z. Lehmanni. This very showy Orchid, described in Vol. IV., p. 246, is shown at Fig. 770.

Z. Lindeniæ (Mme. Linden's).* *fl.*, sepals and petals pale brownish-rose, narrow-lanceolate, acute; lip white, closely marked with crimson lines all over, large, ovate, acute; callus of a deep rose-colour, large and thick. Venezuela, 1892. In the shape of its flowers and in habit this beautiful species somewhat resembles *Z. rostratum.* (G. C. 1892, xi., p. 172, f. 27; L. vi., t. 275.)

FIG. 772. ZYGOPETALUM ROLLISSONI.

Z. Lindenii (Linden's). *fl.* white, 3in. across vertically, with some purple streaks on the disk of the obscurely three-lobed lip; sepals and petals lanceolate, acuminate; column bent; peduncles very short, one-flowered. June. *l.* ligulate or broadly oblanceolate, acute, 7in. to 9in. long. Pseudo-bulbs wanting. Habitat not recorded, 1892. (L. viii., t. 337.) SYN. *Warscewiczella Lindenii* (J. H., June, 1892, p. 461).

Z. lucidum (clear).* *fl.* 2in. across; segments light brown in front, white at base, each having a transverse, green band;

Zygopetalum—*continued.*

front lobe of lip purple and yellow, the keels margined with brownish-lilac; peduncle one-flowered. *l.* linear-oblanceolate, 6in. long. British Guiana, 1889. Allied to *Z. Mekagris*, but smaller.

Z. Mackayi. This somewhat variable species, described in Vol. IV., is shown at Fig. 771. It is one of the finest and best-known species in cultivation.

Z. peruvianum (Peruvian). *fl.* 2in. across, few in a raceme; sepals and petals brown, tipped with green; lip white, dotted with purple. *l.* lanceolate, about 8in. long. Pseudo-bulbs four-angled, 2in. long. Peru, 1895. SYN. *Batemannia peruviana* (G. C. 1895, xvii., p. 551).

Z. (*Bollea*) **pulvinare** (powdery). This does not appear to differ from *Z. coeleste*.

Z. Rivieri and **Z. Rœzlii** are given by some as forms of *Z. intermedium*, but *Z. Rœzlii* is an altogether different type from *Z. intermedium*; it is a distinct variety of the *Pescatorea* section of Zygopetalums.

Z. Rollissoni. The flowers of this pretty species, described in Vol. IV., are freely produced, and last a long time in the cut state. See Fig. 772, for which we are indebted to the Editor of the "Garden."

Z. Ruckerianum (Rucker's). *fl.*, sepals and petals white, with a large, light purple area near the green base, twisting, undulated, acute; lip purple, with a white callus and some yellow at the base of the side lobes, revolute on each side, and rolled underneath at the top. 1885. Stove. Much in the way of *Z. Dayanum*.

Z. Sanderianum (Sander's). *fl.*, sepals and petals yellowish-green, spotted at base with purplish-brown, lanceolate; lip blue, roundish-obovate, purplish at base; scape few-flowered. *l.* lanceolate, acute. Stem creeping, bearing distant pseudo-bulbs. Habitat not recorded, 1890. This somewhat resembles *Z. Gautierii*. (R. G. 1890, t. 1287.)

Zygopetalum—*continued.*

Z. Schrœderianum (Baron von Schrœder's). *fl.* fragrant, wax-like, pure white, with the exception of the peculiarly-formed lip, which is of a rose-pink tint. Andes of Colombia, 1895. (G. C. 1895, i., p. 497, f. 70.) SYN. *Bollea Schrœderiana*.

Z. stapelioides heteropteron (variable-winged). A curious variety, having the sepals only partly blotched and striped with a lighter brown than the petals, which are more striped than in the type. 1883.

Z. Vervaeti (Vervaet's). *fl.*, sepals and petals of a waxy-white, tipped with claret-crimson; lip entirely claret-crimson. Habitat not recorded, 1882. Allied to *Z. Klabochorum*. SYN. *Pescatorea Vervaeti*.

Z. Wallisii (Wallis'). The correct name of *Batemannia Wallisii*.

Z. W. major (greater). *fl.* 5½in. in diameter; sepals and petals white at base, chestnut-brown above, tessellated; petals striped deep purple at their lower extremities; lip chestnut-brown, reticulated, margined blackish-purple. Costa Rica. This giant variety requires to be kept constantly moist. (W. O. A. iv., t. 185.)

Z. Whitei (R. B. White's). *fl.* creamy-white, 2½in. across, with a golden-yellow disk; segments a little undulated; lip broadly cordate-orbicular, the front margin reflexed; peduncles shorter than the leaves. *l.* narrowly cuneate-oblanceolate, acuminate, 10in. to 14in. long. Colombia, 1890.

Hybrids.

NAME.	PARENTAGE AND RAISER.
Clayi	*maxillare* and *crinitum* (Clay).
crinito-maxillare	*crinitum* and *maxillare* (Rothschild).
leucochilum	*Mackayi* and *Burkii* (Veitch).
Perrenoudii	*intermedium* and *maxillare Gautier* (Peeters).
Sedeni	*Mackayi* and *maxillare* (Veitch).

ERRATA.

PAGE

59. Aopla. *for* Herminium *read* Habenaria.

95. Asplenium. *for* A. nigrum *read* A. Adiantum-nigrum.

142. Bellwort. *for* Utricularia *read* Uvularia.

247. Clivia. The paragraph headed Curas refers to Clivia.

307. Second column, line three, should *read* Liberal moisture will be required at the roots during the growing season. Only sufficient should be given while the bulbs are at rest to maintain them in a plump condition.

332. Drymophlœus. D. leprosus (Syn. D. Rumphii) and D. oliveæformis (of Martius) are species distinct from D. appendiculatus (Syn. D. oliveæformis, of Watson).

PAGE

340. Elephant's Hedge Bean-tree. *for* Schomburgkia *read* Schotia.

405. Guizotia. *for* oleifera *read* abyssinica.

431. Hurtle Berry. *for* Vitis-Idæa *read* Myrtillus and other species.

526. Matteuccia. *for* Struthiopteris *read* germanica.

562. Œnothera. (E. taraxacifolia is the correct name of (E. acaulis.

652. Salix laurina. *for* filicifolia *read* phylicifolia.

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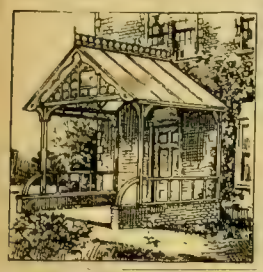

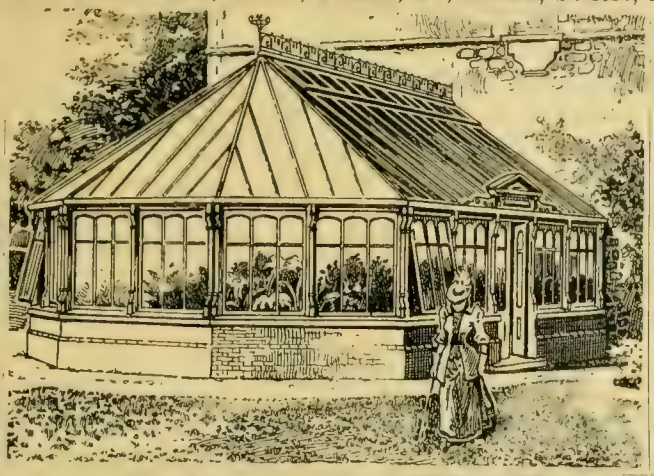

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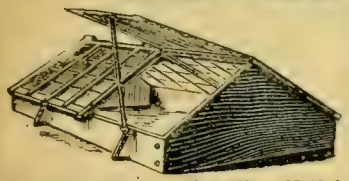

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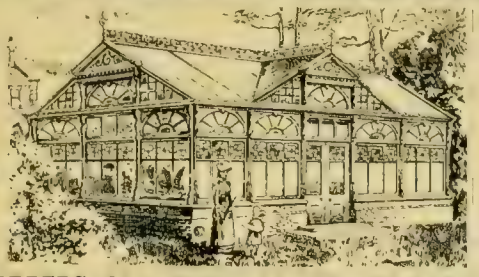

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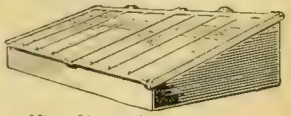

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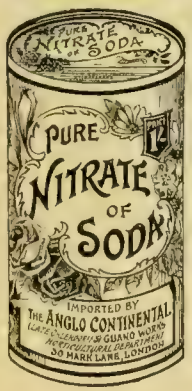

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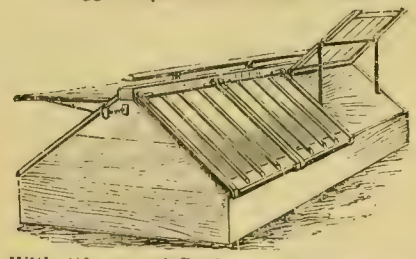

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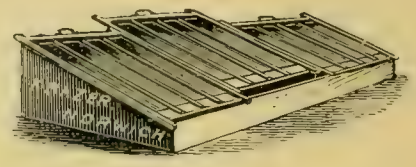
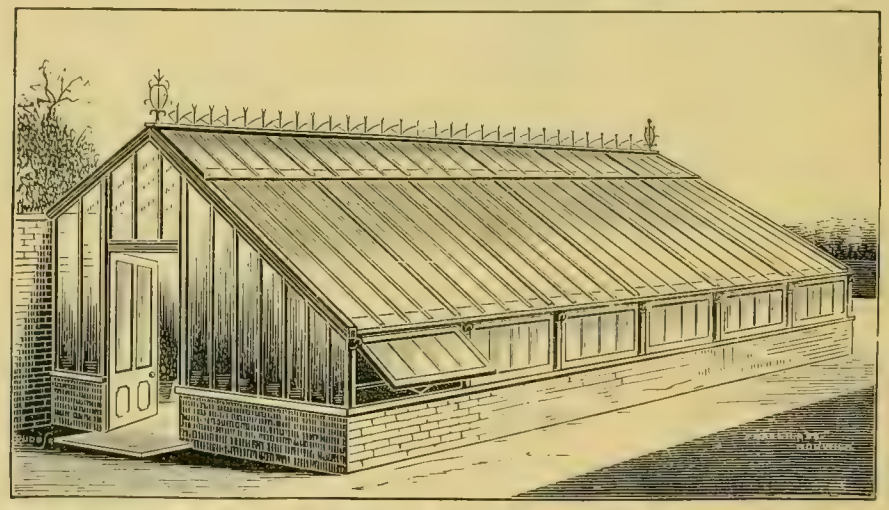


No. 34.—THREE-QUARTER SPAN-ROOF GREENHOUSE.



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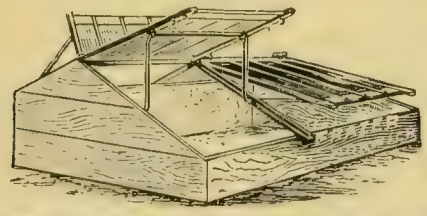

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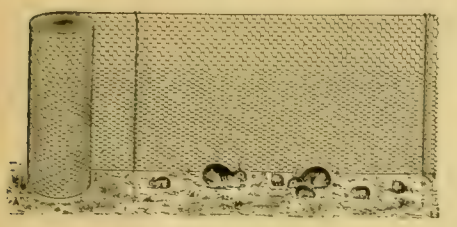

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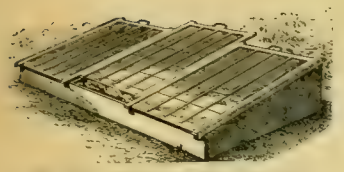

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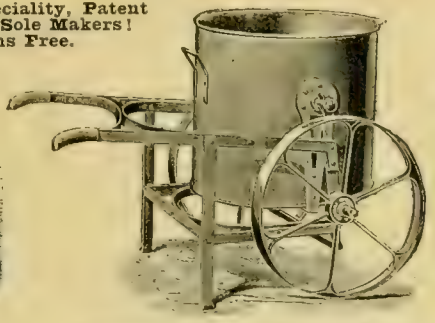

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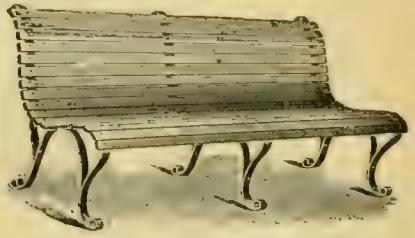

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10 ,, ...	13	4	... ,,		5	0	5 ,, ...	14	0	... ,,		2	6
20 ,, ...	26	8	... Cask		5	0	10 ,, ...	25	6	... ,,		5	0
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